



Technology Student Association (TSA)

MIDDLE SCHOOL COMPETITIVE EVENTS GUIDE

for the 2020 and 2021
National TSA Conferences

with correlations to
Science, Technology, Engineering, and
Mathematics (STEM) Standards



ACKNOWLEDGMENTS

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This competitive events guide is dedicated in memory of

Dr. Laura Hummel

Laura's contributions as a TSA Competition Regulations Committee (CRC) manager, her commitment to education, and her service to others have had a significant impact on the TSA community nationwide.

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TSA, THE ORGANIZATION

TSA MISSION

The Technology Student Association (TSA) enhances personal development, leadership, and career opportunities in STEM, whereby members apply and integrate these concepts through intra-curricular activities, competitions, and related programs.

WHO ARE TSA MEMBERS?

TSA is devoted exclusively to the needs of students engaged in science, technology, engineering, and mathematics (STEM). Open to those who are enrolled in or who have completed technology and engineering courses, TSA has 250,000 middle and high school student members across the country. TSA is supported by educators, parents, and business leaders who believe in the need for a technologically literate society. TSA members learn through exciting competitive events, leadership opportunities, and membership activities. It is the intent of TSA to involve as many TSA members as possible in competitive events and provide recognition in a setting of fair play practices using TSA event guidelines.

Explore what TSA has to offer by using this guide and by visiting [TSAweb.org](https://tsa.org) for information. With competitive events that range from video game design to structural engineering and much more, there is something to capture the imagination of—and bring out the best in—all students. We hope that with teacher guidance, students will enjoy the challenge of TSA's competitive events at local, state, regional, and national TSA conferences.

The competitions in this guide support a broad spectrum of goals related to STEM curriculum. They also promote leadership skills and a focus on future career choices.

THE ROLE OF COMPETITIVE EVENTS

To follow its mission, TSA offers stimulating competitive events and recognition in both technology and leadership arenas. TSA believes that by participating in carefully designed competitions, students learn to do their best, thereby becoming “winners” whether or not they place in a competition. Many teachers find that TSA's competitive events provide an excellent motivational tool in the academic environment.

Every two years, TSA's competitive events are reviewed and revised by the Competition Regulations Committee (CRC), a standing group of technology and engineering educators with hands-on classroom experience. The *Technology Student Association (TSA) Middle School Competitive Events Guide for the 2020 & 2021 National TSA Conferences* is the result of the work of CRC managers, competitive event coordinators, teachers, proposals of numerous TSA state and chapter advisors, and students who make TSA competitive events current and dynamic. The guide presents rules and regulations for all National TSA Conference competitive events; a view of each event's connection to STEM standards; and suggested careers. Relevant for all levels of competition (state delegations may choose to adopt the national guidelines for state-level competitions), the guide provides an excellent motivational tool for curricular study and activities in the classroom.

ABOUT THIS GUIDE

With the publication of the *2020 & 2021 TSA Middle School Competitive Events Guide*, please note the following:

1. The format of this guide has been streamlined to help competitors and advisors know and clearly understand the TSA Conference General Rules and Regulations, and the procedures, regulations, and evaluation criteria for each event.
2. General rules that apply to all participants across every competitive event are no longer identified in each competition's regulations. Therefore it is critical, and a personal responsibility of each competitive event participant and advisor, to read and fully adhere to the TSA General Rules and Regulations. As an example, should a competitive event require a written test to be taken, there is no longer a specific reminder in the event guidelines for participants to bring their own pencil to the event.
3. Every event's guidelines have been revised in some form, whether in content or in format.



COMPETITIVE EVENTS PROGRAM



LEVELS OF COMPETITION

- A. The breakdown of grades noted below is used to designate levels for competition entries. Each level has its own unique competitive events guide.
- Middle School/Junior High School level—Grades 5, 6, 7, 8, 9
 - High School level—Grades 9, 10, 11, 12
 - Ninth graders must compete at the level in which the chapter affiliates.
 - If the configuration of the school includes grades 9-12, ninth grade students must compete in high school events.
 - If the configuration of the school includes grades 6-9 or 7-9, ninth grade students must compete in middle school events.
- B. If the school has a K-12 configuration, or a configuration other than the examples above, national TSA should be contacted for clarification and approval regarding the appropriate school level designation.

GENERAL RULES AND REGULATIONS

NOTE: General rules and regulations apply to *all* competitive events and are *in addition* to each event's specific guidelines.

A. Affiliation and Membership

1. TSA members, advisors, and chapters must be currently affiliated with TSA to enter any competitive event.
2. TSA membership rights extend through the year of graduation.
3. Students who graduate midyear may compete at the national conference that immediately follows their end-of-year graduation.

B. Conference Registration, Attendance, and Participation in Events

1. Individuals who wish to attend the conference must complete conference registration.
2. Students must be registered and be in attendance with an adult chaperone at the National TSA Conference in order to enter and become a semifinalist or finalist in any event.
3. All adult advisors, chaperones, and student participants must be in attendance for the entire conference.
4. National TSA Conference registrants must wear conference identification badges at all times.
5. The TSA competitive event limit is six (6) events per conference participant, individual and team events combined.
6. Team events:
 - a. All team members must be affiliated with the same chapter.
 - b. To enter a team event, the chapter designates only that it is participating; names of the individual team members are not necessary.
 - c. Unless otherwise designated in a competition's eligibility guideline, the maximum size of a team is six (6) members.

C. Student Responsibilities for Competitions

1. It is the individual responsibility of each participant to obtain all rules and guidelines for competitive events.
2. Lack of knowledge or understanding about a particular event is neither reason nor excuse for an individual to request an accommodating adjustment or change.
3. *Students and advisors must routinely check the TSA website, [TSAweb.org](https://tsa.org), for updated information about TSA general rules and competitive event guidelines. One month prior to the conference, no additional updates will be posted to this page.*
4. Students who participate in any TSA competitive event are responsible for knowing all updates, changes, and clarifications related to that event.

D. Competition Entries

1. Entries must be started and completed during the current school year.
2. Entries may be submitted for one (1) year, and one (1) competition only. An infraction of this rule results in disqualification.
3. Each participant/team shall submit only one (1) entry per event.
4. All entries requiring documentation materials (comprising a “portfolio”) must be secured in a clear front report cover unless otherwise indicated in an event’s regulations. Click [here](#) for a sample report cover.
5. All entries must be in English.
6. Participants must check in and pick up their event entries at the times and places stated in the conference program, or as announced during the National TSA Conference.
7. For any competition that involves the use of a pencil (e.g., for taking a written test, for producing required sketches), participants must provide—and bring to the test site two (2) pencils, either:
 - sharpened standard #2/HB grade with an eraser, or
 - #2 mechanical with an eraser.
8. Entry content:
 - a. National TSA provides guidelines for individual and team entry content but does not bear responsibility for content choices made by participants.
 - b. Entries are evaluated on the basis of an event’s official rating form.
9. Projects and/or products:
 - a. Unless otherwise specified, no identifying information—other than a student or team ID#—is to be included on an entry.

b. Exceptions to this rule are:

i. middle school competitive events:

1. Career Prep
2. Children’s Stories
3. Community Service Video
4. Construction Challenge
5. Structural Engineering

ii. high school competitive events:

1. Children’s Stories
2. Digital Video Production
3. Structural Design and Engineering

iii. Events that require submission of a Plan of Work Log shall include indication of student initials only.

c. Unless otherwise noted, for all events that require a display, the size of the display may not exceed 15" deep x 3' wide x 4' high.

10. TSA may choose to keep National TSA Conference student entries.

- a. Such entries may be used by national TSA for promotional purposes. Should that occur, credit for any such entry would be noted by TSA.
- b. If applicable, the USB flash drive entries become property of TSA and will not be returned.

E. Citations, References, and Copyrighted Material

1. For all applicable competitive events, citations or references must follow MLA (Modern Language Association) style.
2. All entries must be the original work of the student participant or student team.
3. All ideas, text, images (including those labeled “for reuse”), and sound from other sources must be cited.
4. If copyrighted material is used, written permission must be included.
 - a. An Internet search about copyrighted material and copyright fair use is recommended if ideas, text, images, or sound from other sources is incorporated into an event entry.

- b. For information about the use of the TSA logo, refer to Toolkit page of the [TSA website](#).
- 5. Failure to follow any of the above procedures results in disqualification.

F. Prohibited Materials, References, and Images

- 1. Hazardous materials, chemicals, lighted or open flames, combustibles, wet cell batteries, and other similar substances are not allowed at the National TSA Conference.
- 2. No viruses, live plants, or animals may be used as a part of the display.
- 3. Competition entries or presentations by participants must not include racial or ethnic slurs/symbols, reference to gang affiliation, or vulgar, violent, subversive, or sexually suggestive language or images.
- 4. Entries or presentations may not promote products that students may not legally buy, such as tobacco, alcohol, or illegal drugs.
- 5. Images of guns, knives, or other weapons are prohibited.
- 6. Failure to follow any of the above procedures results in disqualification.

G. TSA Liability

- 1. TSA is not responsible or liable for any personal property, equipment, or materials brought to the National TSA Conference for use by a participant or attendee.

H. Event Scheduling Conflicts

- 1. When an event scheduling conflict could prevent an individual from participating in an event, the individual has the right to not compete in an event.

I. Emergencies

- 1. Team member substitution may be allowed should a documented emergency arise in team events that involve written and semifinalist segments. All substitutions must be approved by the event manager and coordinator.

2. Change requests:

- a. Should a change be requested for any reason after the stated deadlines, a \$50 change fee will be charged per person per event, if the change is approved.
- b. Only chapter members previously registered as competitors by the conference registration deadline will be eligible for change requests.
- c. TSA reserves the right to approve or not approve a requested change.
- d. Fees must be paid by credit card, check, or cash prior to any change being made.
- e. No changes will be made once competitions start.

J. Event Judging

- 1. All events are judged in accordance with the stated event criteria as noted in this competitive events guide.
- 2. The decisions of judges related to competitive events are final.

K. Procedure for filing a grievance with the Rules Interpretation Panel

The Rules Interpretation Panel (RIP), a group made up of at least three (3) CRC members, monitors and oversees the competitive events during the National TSA Conference. The panel provides a means by which state advisors may express grievances and concerns about conference situations that pertain to events, and it ensures continuity from year to year for competitive event rules and regulations.

- 1. All concerns must be in writing using the correct form in the guide. The Rules Interpretation Panel Grievance form (see Forms Appendix) must be completed in its entirety.
- 2. Only state advisors may submit a request to the Rules Interpretation Panel (RIP) at the national conference. Should an individual/team/chapter advisor have a concern about an event, the state advisor shall be the point of contact. National TSA will not accept forms from anyone other than the state advisor.

3. During the conference, the RIP panel will meet to discuss and analyze the advisor's concern.
4. It is the intent of the panel to resolve any grievances at the conference with a written response to the state advisor.
5. Only the state advisor may pick up the written response from the RIP panel.
6. All decisions made by the panel are final.

L. Rules Violations and Disqualifications

1. A rules violation that gives a contestant an unfair advantage will result in a twenty percent (20%) deduction of the total possible points in each preliminary and semifinal round.
2. The coordinator or manager of an event has the right to disqualify a contestant when this type of incident occurs.
3. The event coordinator and manager must sign off on both a twenty percent (20%) deduction and a disqualification.

M. Semifinalists

1. Should the competition have a semifinal round, the event will have a minimum of twelve (12) semifinalists.
2. Semifinalists (individuals or teams, as applicable) will compete against one another to determine the top ten (10) finalists in an event.
3. All members of a semifinalist team must participate in the semifinalist portion of an event, unless otherwise noted in the event's regulations

N. Electronic Devices

1. Recording devices are not allowed in certain competitive events.
2. CRC manager and event coordinator approval is required before any event may be recorded.
3. All electronic devices, including but not limited to cell phones, iPads/tablets, electronic readers, smart watches, etc., *must* be turned off unless otherwise noted in specific event regulations.
4. No electronic communication devices of any kind are permitted during competition.

COMPETITION REGULATIONS COMMITTEE

The Competition Regulations Committee (CRC) is charged with reviewing TSA's competitive events, updating them as necessary, and presiding over the competitive events at the annual National TSA Conference. The all-volunteer CRC is composed of dedicated STEM teachers and education professionals from across the country who have made major commitments to create and maintain the high quality of national TSA's competitive events. See who they are by clicking the TSA Directory on the [TSA website](#).

Ideas and feedback regarding events are always welcome. Guidelines and forms can be found in the Forms Appendix of this guide for proposing a new event and for suggesting revisions to existing event.

EVENT COORDINATOR REMINDERS

TSA is grateful for the support of its event coordinators, many of whom are teachers attending the conference with students from their chapters. The busy schedules of these individuals prompt the reminders that follow.

- A. Competitive event coordinators must be present for a mandatory event coordinator's meeting on the first day of the conference.
- B. Competitive event coordinators must be present for conference event check-in and check-out if they are coordinating an event in which these activities take place.
 1. Generally speaking, "check-in" is on the evening of registration day, and "check-out" is held on the day before the awards ceremony.
 2. Tentative schedule information will be available before the conference on the [TSA website](#).
- C. The Competition Regulations Committee, which consists of all the event managers, is available throughout the conference to support coordinators as they supervise competitive events.

AWARDS

At the conference awards ceremony, ten (10) finalists in each event are identified in random order and called to the stage for recognition.

EVENT PROPOSAL INFORMATION

As technology evolves and technology education attempts to keep pace and reflect these changes, new TSA events are added, some are revised, and others are dropped. TSA chapter advisors, state advisors, and others are encouraged to submit proposals for new events.

The following topics reflect potential direction for development:

- 21st century technology
- 3D printing
- Adaptive/Assistive Technology
- Cloud computing
- CoDrone
- Cyber Robotics Coding
- Data management
- Economic development
- Electronic publishing
- Engineering
- Environmental technology
- Fluid power technology
- Future technologies
- Green technology
- Innovative power sources
- Lasers/satellites/radar
- Manufacturing technology
- Mobile apps
- Social media marketing
- Transportation technology

When submitting a proposal for consideration, include these elements:

- Overview (description of the event and participant expectations)
- Eligibility for entry
- Limitations (such as time or entry submission requirements)
- Resource considerations (i.e. are the resources a limiting factor, or are they affordable/readily available to all populations? Can this be executed at the national level?)
- Specific regulations
- Required personnel
- Alignment with STEM standards

Formative ideas are welcome, but the more complete the proposal the less likely it will be misinterpreted. The Competition Regulations Committee (CRC) acknowledges all submissions, and each is given consideration for possible inclusion in a competitive events guide. Once submitted, ideas and events become the property of national TSA. Proposals must be submitted by July 1 of the prior conference year in order to be considered for the next guide.

Find the form in the Forms Appendix of this guide. Proposals must include the submitter's name and complete contact information. Proposals may be mailed to CRC, c/o National TSA, 1904 Association Drive, Reston, VA 20191-1540, or emailed in a Word file attachment to general@tsaweb.org.

NATIONAL TSA CONFERENCE DRESS CODE AND OFFICIAL CONFERENCE ATTIRE GUIDELINES

- A. Chapter and state advisors, parents, and chaperones are responsible for seeing that all TSA student members wear TSA competition, general session, or casual attire as occasions may require.
- B. Everyone who is registered for the conference, including parents, guests, and children, must comply with the TSA dress code policy.
- C. TSA attire may be purchased online via the SHOP tab on the [TSA website](#).
- D. Because adults (advisors, parents, and guests) serve as role models at TSA conferences and activities, they are expected to dress appropriately for all TSA occasions they attend.
- E. Students must adhere to the TSA dress code requirements as listed in this section and on the [TSA website](#).
- F. When students compete in any competitive event they must wear competition attire.
- G. Students not in appropriate competition attire when they compete may be allowed to participate in an event, but they will lose twenty percent (20%) of the total possible points per round.

COMPETITION ATTIRE

1. **Shirt:** official royal blue TSA shirt
2. **Pants or skirt:** gray
3. **Shoes:** black dress shoes worn with black or dark blue socks, hosiery (optional):
 - open-toed shoes or sandals are acceptable
 - *unacceptable:* athletic shoes; flip-flops; military boots; or work boots

4. Also required for the middle school or high school level Chapter Team event only (but may be worn for other competitions if preferred by participants):

- **Blazer:** navy blue with official TSA patch
- **Tie:** official TSA tie (males)

Females are not penalized for wearing the official TSA tie to Chapter Team or any other competitive event

GENERAL SESSION ATTIRE

1. **Shirt:** The official TSA shirt (royal blue) is preferred; button-down shirt; polo/golf shirt
 - *Unacceptable:* T-shirts; halter tops; tank tops
2. **Dress, skirt, or pants**
 - *Unacceptable:* jeans; baggy pants; exterior pocket pants; shorts
3. **Shoes:** dress shoes worn with dark socks or hosiery (optional); open-toed shoes or sandals are acceptable
 - *Unacceptable:* athletic shoes; flip-flops; military boots; or work boots

CASUAL ATTIRE

1. Appropriate t-shirts, shorts, or jeans
2. Casual attire **may not** be worn at competitions or general sessions

AWARDS CEREMONY

1. TSA General Session Attire is required for the Awards Ceremony.
2. Registered parents, guests, and children who are not compliant with TSA General Session Attire and who wish to attend the Awards Ceremony, may be asked to sit in a designated section, if permitted entry.

TSA'S LEADERSHIP PROGRAM



PARTNERSHIP FOR 21ST CENTURY SKILLS (P21)

In 2002, the Partnership for 21st Century Skills (now the Partnership for 21st Century Learning, or P21) was founded as a non-profit organization by a coalition that included members of the national business community, education leaders, and policymakers. To foster a national conversation on “the importance of 21st century skills for all students” and “position 21st century readiness at the center of US K-12 education.”

21st century skills comprise skills, abilities, and learning dispositions that have been identified as being required for success in 21st century society and workplaces by educators, business leaders, academics, and governmental agencies. This is part of a growing international movement focusing on the skills required for students to master in preparation for success in a rapidly changing, digital society. Many of these skills are also associated with deeper learning, which is based on mastering skills such as analytic reasoning, complex problem solving, and teamwork. TSA's competitive events provide a natural platform to highlight the leadership and 21st century capabilities of students.

TSA's leadership program engages participants to be the best member they can be, as they seek knowledge about themselves, the organization, and their community, while developing and demonstrating leadership and 21st century skills. Leadership and 21st century skills components are all specifically tailored for each individual competitive event, and are evaluated based on the official rules and rubrics.

- For example, in one competitive event team members might note the communication, collaboration, and teamwork skills they used to finalize their idea/design in their Plan of Work Log. While in another event, a brief discussion of leadership skills and/or 21st century skills that they developed or demonstrated while working on a project might be highlighted as part of an existing presentation/interview. Criteria will be included in the rubric to evaluate the leadership and 21st century skills documented or demonstrated within these components.

TSA's leadership program has recently been revised to incorporate the 21st century skills. LEAP has been replaced with a TSA leadership program that features the development of leadership and 21st century skills. All references to LEAP, required documentation, and LEAP interviews will no longer be part of the competitive events program, along with the LEAP Legacy Chapter program.

TSA will provide related resources to affiliated chapters through the updated TSA member database. Participation in the TSA competitive events develops leadership and 21st century skills in student members, skills essential for success in the job market.

- There will be other competitive events in which a student/team may naturally demonstrate leadership skills as part of the event. In these events, criteria will be included in the rubric to evaluate the overall leadership and 21st century skills demonstrated.

During the course of preparing for, and participating in a TSA competitive event, participants will study leadership and 21st century skills, and put them into practice. Participants will use the widely accepted leadership and 21st century skills resources, in addition to other resources provided on the TSA website, as they complete the competitive event leadership requirements for all TSA competitions.

TSA believes that acquiring leadership and 21st century skills is critical to the success of young people. The resources found on the TSA website provide TSA advisors with a source for teaching, and students with an opportunity to practice these crucial skills.

TSA's leadership program focuses on the below definitions of leadership and 21st century skills as developed through participation in middle and high school competitions:

Communication: a process by which information is exchanged between individuals through a common system of symbols, signs, or behavior

Collaboration/Social Skills: to work jointly with others, especially in an intellectual endeavor

Initiative: energy or aptitude displayed in initiation of action

Problem Solving/Risk Taking: the process or act of finding a solution to a problem/the act or fact of doing something that involves danger or risk in order to achieve a goal

Critical Thinking (lateral thinking): a method for solving problems by making unusual or unexpected connections between ideas

Perseverance/Grit: continued effort to do or achieve something despite difficulties, failure, or opposition/firmness of mind or spirit—unyielding courage in the face of hardship or danger

Creativity: the quality of being creative

Relationship Building/Teamwork: work done by several associates with each doing a part but all subordinating personal prominence to the efficiency of the whole

Dependability/Integrity: capable of being trusted or depended on/firm adherence to a code of especially moral or artistic values

Flexibility/Adaptability: characterized by a ready capability to adapt to new, different, or changing requirements

SOURCES

en.wikipedia.org/wiki/21st_century_skills

www.merriam-webster.com/dictionary/dictionary

www.edglossary.org/21st-century-skills

www.nea.org/home/34888.htm

www.lead4change.org/wp-content/uploads/2019/09/L4C_21stCenturySkillsAlignment_12-Track_2020.pdf

SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) INTEGRATION



In recent years, not only educators, but also political, civic, and industry leaders have pushed for a greater emphasis on STEM education in schools. It is globally recognized that in order for any nation to be competitive, our future generations must develop competency in the 21st century skills afforded through STEM fields. TSA promotes a vision of students literate in these fields and believes competitions within this guide help make that vision a reality.

STEM education is not just an isolated and discreet acquisition of STEM knowledge and skills. Rather, STEM education demands the interdisciplinary application of these academic fields to improve outcomes in comprehension, communication, and problem solving. It is commonly accepted that the correlation between these STEM disciplines is interdependent. In order to develop a deep comprehension of one STEM area, one must simultaneously have an encompassing knowledge of another. For example, to design and engineer with any degree of complexity, one also must be familiar with technology, mathematics, and science. To practice science, one must have a firm knowledge of mathematics and technology.

Beyond necessity, there is another reason for STEM education in our schools and why the TSA program of activities inherently aligns with STEM goals. This reason revolves around teaching, learning, and what motivates our 21st century learners.

When students participate in TSA competitions, they find they must not only embrace the value of design when they compete, but they also must conceptualize, assess, and materialize that vision. Students may choose to work

collaboratively, depending upon the requirements of an event, or they may choose to work independently.

Irrespective of this choice, students develop the essential leadership and critical thinking skills to execute their strategy and align their intention with the STEM objectives set forth in this guide. STEM education is intrinsically exciting, rewarding, and meaningful for instructors and students alike. Through TSA competitive events, instructors challenge students to solve real-world problems through project-based learning and reflective experiences. This rigorous process supplements and complements classroom objectives by asking students to critically evaluate all aspects of their thought processes—from design, to communication, to execution.

Deserving of mention are three other essential areas embedded in most of TSA's competitive events—creativity, innovation, and ethics. Teaching students to think outside the box while considering the ethical consequences provides a global perspective essential to the success of our society. Through TSA competitions, students are asked to design creatively, while assessing the effects and impacts of what they develop.

The competitions found in this guide provide a hands-on venue for learning about STEM. By participating in TSA's competitive events, students gain a broader understanding of these content areas as they experience the satisfaction that comes from applying them to real life, problem-solving situations.

This section of the guide includes commonly accepted national standards for the areas of science, technology, and mathematics, as well as the Accreditation Board for Engineering and Technology (ABET, Inc.) criteria for accrediting higher education engineering programs.

NEXT GENERATION SCIENCE STANDARDS* (GRADES 5-8)**A. Structure and Properties of Matter**

1. **PS1-1:** Develop models to describe the atomic composition of simple molecules and extended structures.
2. **PS1-3:** Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.
3. **PS1-4:** Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

B. Chemical Reactions

1. **PS1-2:** Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
2. **PS1-5:** Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.
3. **PS1-6:** Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.*

C. Forces and Interactions

1. **PS2-1:** Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.*
2. **PS2-2:** Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.
3. **PS2-3:** Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.
4. **PS2-4:** Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.
5. **PS2-5:** Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.

D. Energy

1. **PS3-1:** Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.
2. **PS3-2:** Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system
3. **PS3-3:** Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.*
4. **PS3-4:** Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.
5. **PS3-5:** Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.

E. Waves and Electromagnetic Radiation

1. **PS4-1:** Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.
2. **PS4-2:** Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
3. **PS4-3:** Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.

F. Structure, Function, and Information Processing

1. **LS1-1:** Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
2. **LS1-2:** Develop and use a model to describe the function of a cell as a whole and ways the parts of cells contribute to the function.

3. **LS1-3:** Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
4. **LS1-8:** Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

G. Matter and Energy in Organisms and Ecosystems

1. **LS1-6:** Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
2. **LS1-7:** Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.
3. **LS2-1:** Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
4. **LS2-3:** Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
5. **LS2-4:** Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

H. Interdependent Relationships in Ecosystems

1. **LS2-2:** Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems
2. **LS2-5:** Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

I. Growth, Development, and Reproduction of Organisms

1. **LS1-4:** Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

2. **LS1-5:** Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
3. **LS3-1:** Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.
4. **LS3-2:** Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.
5. **LS4-5:** Gather and synthesize information about technologies that have changed the way humans influence the inheritance of desired traits in organisms.

J. Natural Selection and Adaptations

1. **LS4-1:** Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.
2. **LS4-2:** Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.
3. **LS4-3:** Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.
4. **LS4-4:** Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment
5. **LS4-6:** Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

K. Space Systems

1. **ESS1-1:** Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons
2. **ESS1-2:** Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system
3. **ESS1-3:** Analyze and interpret data to determine scale properties of objects in the solar system

L. History of Earth

1. **ESS1-4:** Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.
2. **ESS2-2:** Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales
3. **ESS2-3:** Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions

M. Earth's Systems

1. **ESS2-1:** Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.
2. **ESS2-4:** Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
3. **ESS3-1:** Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

N. Weather and Climate

1. **ESS2-5:** Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.
2. **ESS2-6:** Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates

3. **ESS3-5:** Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

O. Human Impacts

1. **ESS3-2:** Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
2. **ESS3-3:** Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
3. **ESS3-4:** Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

P. Engineering Design

1. **ETS1-1:** Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
2. **ETS1-2:** Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
3. **ETS1-3:** Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
4. **ETS1-4:** Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Although not formally aligned, this standards alignment of TSA competitive events has been developed in accordance with the Next Generation Science Standards (NGSS) model.

*The Next Generation Science Standards (NGSS) were developed by educators, content experts and policymakers, using as a guiding document the Framework for K-12 Science Education from the National Research Council. The Next Generation Science Standards is a registered trademark of Achieve. Neither Achieve nor the lead states and partners that developed the Next Generation Science Standards were involved in the production of this product, and do not endorse it.

NEXT GENERATION SCIENCE STANDARDS																																
Event	Standard Number	A-PS1-1	A-PS1-3	A-PS1-4	B-PS1-2	B-PS1-5	B-PS1-6	C-PS2-1	C-PS2-2	C-PS2-3	C-PS2-4	C-PS2-5	D-PS3-1	D-PS3-2	D-PS3-3	D-PS3-4	D-PS3-5	E-PS4-1	E-PS4-2	E-PS4-3	F-LS1-1	F-LS1-2	F-LS1-3	F-LS1-8	G-LS1-6	G-LS1-7	G-LS2-1	G-LS2-3	G-LS2-4	H-LS2-2	H-LS2-5	
Biotechnology		X																			X											
Career Prep																																
Challenging Technology Issues																																
Chapter Team																																
Children's Stories																																
Coding																																
Community Service Video																																
Computer-Aided Design (CAD) Foundations																																
Construction Challenge																																
Cybersecurity																																
Data Science and Analytics																																
Digital Photography																																
Dragster																	X															
Electrical Applications																																
Essays on Technology																																
Flight														X																		
Forensic Technology																																
Foundations of Information Technology (FIT)																																
Inventions and Innovations																																
Junior Solar Sprint															X	X																
Leadership Strategies																																
Mass Production																																
Mechanical Engineering																																
Medical Technology		X																					X	X								
Microcontroller Design																																
Off the Grid																																
Prepared Speech																																
Problem Solving																																
Promotional Marketing																																
STEM Animation																																
Structural Engineering																																
System Control Technology																																
Tech Bowl																																
Technical Design																																
Video Game Design																																
Website Design																																

NEXT GENERATION SCIENCE STANDARDS – continued																															
Event	Standard Number	I-LS1-4	I-LS1-5	I-LS3-1	I-LS3-2	I-LS4-5	J-LS4-1	J-LS4-2	J-LS4-3	J-LS4-4	J-LS4-6	K-ESS1-1	K-ESS1-2	K-ESS1-3	L-ESS2-2	L-ESS2-3	L-ESS2-4	M-ESS2-1	M-ESS2-4	M-ESS3-1	N-ESS2-5	N-ESS2-6	N-ESS3-5	O-ESS3-2	O-ESS3-3	O-ESS3-4	P-ETS1-1	P-ETS1-2	P-ETS1-3	P-ETS1-4	
Biotechnology																															
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TECHNOLOGY CONTENT STANDARDS

- | | |
|---|--|
| Standard 1: Students will develop an understanding of the characteristics and scope of technology. | Standard 12: Students will develop the abilities to use and maintain technological products and systems. |
| Standard 2: Students will develop an understanding of the core concepts of technology. | Standard 13: Students will develop the abilities to assess the impact of products and systems. |
| Standard 3: Students will develop an understanding of the relationships among technologies and the connections between technologies and other fields of study. | Standard 14: Students will develop an understanding of and be able to select and use medical technologies. |
| Standard 4: Students will develop an understanding of the cultural, social, economic, and political aspects of technology. | Standard 15: Students will develop an understanding of and be able to select and use agricultural and related biotechnologies. |
| Standard 5: Students will develop an understanding of the effects of technology on the environment. | Standard 16: Students will develop an understanding of and be able to select and use energy and power technologies. |
| Standard 6: Students will develop an understanding of the role of society in the development and use of technology. | Standard 17: Students will develop an understanding of and be able to select and use information and communication technologies. |
| Standard 7: Students will develop an understanding of the influence of technology on history. | Standard 18: Students will develop an understanding of and be able to select and use transportation technologies. |
| Standard 8: Students will develop an understanding of the attributes of design. | Standard 19: Students will develop an understanding of and be able to select and use manufacturing technologies. |
| Standard 9: Students will develop an understanding of engineering design. | Standard 20: Students will develop an understanding of and be able to select and use construction technologies. |
| Standard 10: Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving. | |
| Standard 11: Students will develop the abilities to apply the design process. | |
- These technology content standards are noted in *Standards for Technological Literacy: Content for the Study of Technology* (ITEEA, 2000/2002/2007) and are used with permission. (www.iteea.org)

TECHNOLOGY CONTENT STANDARDS																					
Event	Standard Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biotechnology		X	X	X	X	X	X				X		X	X		X					
Career Prep															X	X	X	X	X	X	X
Challenging Technology Issues					X	X	X							X	X	X	X	X	X	X	X
Chapter Team												X									
Children's Stories									X			X						X			
Coding		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Community Service Video				X					X				X					X			
Computer-Aided Design (CAD) Foundations						X			X	X	X		X	X				X	X	X	X
Construction Challenge									X			X						X			
Cybersecurity		X	X	X	X	X	X	X			X		X	X				X	X		
Data Science and Analytics		X	X	X	X	X	X	X	X			X		X				X	X		
Digital Photography									X	X		X	X								
Dragster									X			X					X				
Electrical Applications									X	X	X	X	X	X	X	X	X	X	X	X	X
Essays on Technology		X	X	X	X	X	X							X							
Flight				X					X	X	X	X							X		
Forensic Technology				X						X					X						
Foundations of Information Technology (FIT)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inventions and Innovations					X	X		X	X	X	X				X	X	X	X	X	X	X
Junior Solar Sprint				X					X	X	X	X	X	X			X		X		
Leadership Strategies										X											
Mass Production						X	X		X	X	X	X	X	X					X		
Mechanical Engineering									X	X	X	X	X				X				X
Medical Technology					X	X	X			X	X	X									
Microcontroller Design		X	X	X	X				X	X	X	X	X	X			X				
Off the Grid		X	X	X		X			X	X	X	X	X			X		X	X		
Prepared Speech		X	X	X	X	X		X										X			
Problem Solving									X		X	X									
Promotional Marketing									X	X	X	X	X								
STEM Animation		X		X					X		X	X						X			
Structural Engineering										X	X	X									
System Control Technology				X					X	X	X	X	X				X		X	X	X
Tech Bowl														X	X	X	X	X	X	X	X
Technical Design									X	X		X									
Video Game Design									X	X		X						X			
Website Design									X	X	X	X	X	X							

AP COMPUTER SCIENCE STANDARDS

A. Creative Development (CRD)

1. **CRD-1:** Incorporating multiple perspectives through collaboration improves computing innovations as they are developed.
 - a. **CRD-1.A:** Explain how computing innovations are improved through collaboration.
 - b. **CRD-1.B:** Explain how computing innovations are developed by groups of people.
 - c. **CRD-1.C:** Demonstrate effective interpersonal skills during collaboration.
2. **CRD-2:** Developers create and innovate using an iterative design process that is user-focused, that incorporates implementation/feedback cycles, and that leaves ample room for experimentation and risk-taking.
 - a. **CRD-2.A:** Describe the purpose of a computing innovation.
 - b. **CRD-2.B:** Explain how a program or code segment functions.
 - c. **CRD-2.C:** Identify input(s) to a program.
 - d. **CRD-2.D:** Identify output(s) produced by a program.
 - e. **CRD-2.E:** Develop a program using a development process.
 - f. **CRD-2.F:** Design a program and its user interface.
 - g. **CRD-2.G:** Describe the purpose of a code segment or program by writing documentation.
 - h. **CRD-2.H:** Acknowledge code segments used from other sources.
 - i. **CRD-2.I:** For errors in an algorithm or program:
 - i. Identify the error.
 - ii. Correct the error.
 - j. **CRD-2.J:** Identify inputs and corresponding expected outputs or behaviors that can be used to check the correctness of an algorithm or program.

B. Data (DAT)

1. **DAT-1:** The way a computer represents data internally is different from the way the data are interpreted and displayed for the user. Programs are used to translate data into a representation more easily understood by people.
 - a. **DAT-1.A:** Explain how data can be represented using bits.
 - b. **DAT-1.B:** Explain the consequences of using bits to represent data.
 - c. **DAT-1.C:** For binary numbers:
 - i. Calculate the binary (base 2) equivalent of a positive integer (base 10) and vice versa.
 - ii. Compare and order binary numbers.
 - d. **DAT-1.D:** Compare data compression algorithms to determine which is best in a particular context.
2. **DAT-2:** Programs can be used to process data, which allows users to discover information and create new knowledge.
 - a. **DAT-2.A:** Describe what information can be extracted from data.
 - b. **DAT-2.B:** Describe what information can be extracted from metadata.
 - c. **DAT-2.C:** Identify the challenges associated with processing data.
 - d. **DAT-2.D:** Extract information from data using a program.
 - e. **DAT-2.E:** Explain how programs can be used to gain insight and knowledge from data.

C. Algorithms and Programming (AAP)

1. **AAP-1:** To find specific solutions to generalizable problems, programmers represent and organize data in multiple ways.
 - a. **AAP-1.A:** Represent a value with a variable.
 - b. **AAP-1.B:** Determine the value of a variable as a result of an assignment.
 - c. **AAP-1.C:** Represent a list or string using a variable.

- d. **AAP-1.D:** For data abstraction:
 - i. Develop data abstraction using lists to store multiple elements.
 - ii. Explain how the use of data abstraction manages complexity in program code.
- 2. **AAP-2:** The way statements are sequenced and combined in a program determines the computed result. Programs incorporate iteration and selection constructs to represent repetition and make decisions to handle varied input values.
 - a. **AAP-2.A:** Express an algorithm that uses sequencing without using a programming language.
 - b. **AAP-2.B:** Represent a step-by-step algorithmic process using sequential code statements.
 - c. **AAP-2.C:** Evaluate expressions that use arithmetic operators.
 - d. **AAP-2.D:** Evaluate expressions that manipulate strings.
 - e. **AAP-2.E:** For relationships between two variables, expressions, or values:
 - i. Write expressions using relational operators.
 - ii. Evaluate expressions that use relational operators.
 - f. **AAP-2.F:** For relationships between Boolean values:
 - i. Write expressions using logical operators.
 - ii. Evaluate expressions that use logic operators.
 - g. **AAP-2.G:** Express an algorithm that uses selection without using a programming language.
 - h. **AAP-2.H:** For selection:
 - i. Write conditional statements.
 - ii. Determine the result of conditional statements.
 - i. **AAP-2.I:** For nested selection:
 - i. Write nested conditional statements.
 - ii. Determine the result of nested conditional statements.
 - j. **AAP-2.J:** Express an algorithm that uses iteration without using a programming language.
 - k. **AAP-2.K:** For iteration:
 - i. Write iteration statements.
 - ii. Determine the result or side effect of iteration statements.
 - l. **AAP-2.L:** Compare multiple algorithms to determine if they yield the same side effect or result.
 - m. **AAP-2.M:** For algorithms:
 - i. Create algorithms.
 - ii. Combine and modify existing algorithms.
 - n. **AAP-2.N:** For list operations:
 - i. Write expressions that use list indexing and list procedures.
 - ii. Evaluate expressions that use list indexing and list procedures.
 - o. **AAP-2.O:** For algorithms involving elements of a list:
 - i. Write iteration statements to traverse a list.
 - ii. Determine the result of an algorithm that includes list traversals.
 - p. **AAP-2.P:** For binary search algorithms:
 - i. Determine the number of iterations required to find a value in a data set.
 - ii. Explain the requirements necessary to complete a binary search.
- 3. **AAP-3:** Programmers break down problems into smaller and more manageable pieces. By creating procedures and leveraging parameters, programmers generalize processes that can be reused. Procedures allow programmers to draw upon existing code that has already been tested, allowing them to write programs more quickly and with more confidence.
 - a. **AAP-3.A:** For procedure calls:
 - i. Write statements to call procedures.
 - ii. Determine the result or effect of a procedure call.

- b. **AAP-3.B:** Explain how the use of procedural abstraction manages complexity in a program.
 - c. **AAP-3.C:** Develop procedural abstractions to manage complexity in a program by writing procedures.
 - d. **AAP-3.D:** Select appropriate libraries or existing code segments to use in creating new programs.
 - e. **AAP-3.E:** For generating random values:
 - i. Write expressions to generate possible values.
 - ii. Evaluate expressions to determine the possible results.
 - f. **AAP-3.F:** For simulations:
 - i. Explain how computers can be used to represent real-world phenomena or outcomes.
 - ii. Compare simulations with real-world contexts.
4. **AAP-4:** There exist problems that computers cannot solve, and even when a computer can solve a problem, it may not be able to do so in a reasonable amount of time.
- a. **AAP-4.A:** For determining the efficiency of an algorithm:
 - i. Explain the difference between algorithms that run in reasonable time and those that do not.
 - ii. Identify situations where a heuristic solution may be more appropriate.
 - b. **AAP-4.B:** Explain the existence of undecidable problems in computer science.

D. Computer Systems and Networks (CSN)

- 1. **CSN-1:** Computer systems and networks facilitate the transfer of data.
 - a. **CSN-1.A:** Explain how computing devices work together in a network.
 - b. **CSN-1.B:** Explain how the Internet works.
 - c. **CSN-1.C:** Explain how data are sent through the Internet via packets.

- d. **CSN-1.D:** Describe the differences between the Internet and the World Wide Web.
 - e. **CSN-1.E:** For fault-tolerant systems, like the Internet:
 - i. Describe the benefits of fault tolerance.
 - ii. Explain how a given system is fault-tolerant.
 - iii. Identify vulnerabilities to failure in a system.
2. **CSN-2:** Parallel and distributed computing leverage multiple computers to more quickly solve complex problems or process large data sets.
- a. **CSN-2.A:** For sequential, parallel, and distributed computing:
 - i. a. Compare problem solutions.
 - ii. b. Determine the efficiency of solutions.
 - b. **CSN-2.B:** Describe benefits and challenges of parallel and distributed computing.

E. Impact of Computing (IOC)

- 1. **IOC-1:** While computing innovations are typically designed to achieve a specific purpose, they may have unintended consequences.
 - a. **IOC-1.A:** Explain how an effect of a computing innovation can be both beneficial and harmful.
 - b. **IOC-1.B:** Explain how a computing innovation can have an impact beyond its intended purpose.
 - c. **IOC-1.C:** Describe issues that contribute to the digital divide.
 - d. **IOC-1.D:** Explain how bias exists in computing innovations.
 - e. **IOC-1.E:** Explain how people participate in problem solving processes at scale.
 - f. **IOC-1.F:** Explain how the use of computing can raise legal and ethical concerns.
- 2. **IOC-2:** The use of computing innovations may involve risks to personal safety and identity.
 - a. **IOC-2.A:** Describe the risks to privacy from collecting and storing personal data on a computer system.

AP COMPUTER SCIENCE STANDARDS		Standard Number	CRD-1.A	CRD-1.B	CRD-1.C	CRD-2.A	CRD-2.B	CRD-2.C	CRD-2.D	CRD-2.E	CRD-2.G	CRD-2.H	CRD-2.I	CRD-2.J	DAT-1.A	DAT-1.B	DAT-1.C	DAT-1.D	DAT-2.A	DAT-2.B	DAT-2.C	DAT-2.D	DAT-2.E
Event																							
Biotechnology																							
Career Prep																							
Challenging Technology Issues																							
Chapter Team																							
Children's Stories																							
Coding																							
Community Service Video																							
Computer-Aided Design (CAD) Foundations																							
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Digital Photography																							
Dragster																							
Electrical Applications																							
Essays on Technology																							
Flight																							
Forensic Technology																							
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Tech Bowl																							
Technical Design																							
Video Game Design																							
Website Design																							

AP COMPUTER SCIENCE STANDARDS – continued															
Event	Standard Number	AAP-1.A	AAP-1.B	AAP-1.C	AAP-1.D	AAP-2.A	AAP-2.B	AAP-2.C	AAP-2.D	AAP-2.E	AAP-2.F	AAP-2.G	AAP-2.H	AAP-2.I	AAP-2.J
Biotechnology															
Career Prep															
Challenging Technology Issues															
Chapter Team															
Children's Stories															
Coding		X	X	X			X	X	X	X	X		X	X	X
Community Service Video															
Computer-Aided Design (CAD) Foundations															
Construction Challenge									X						
Cybersecurity															
Data Science and Analytics															
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Mechanical Engineering															
Medical Technology															
Microcontroller Design		X	X	X			X	X	X	X	X		X	X	X
Off the Grid															
Prepared Speech															
Problem Solving															
Promotional Marketing															
STEM Animation		X	X	X			X		X	X	X		X	X	X
Structural Engineering															
System Control Technology		X	X	X			X	X	X	X	X		X	X	X
Tech Bowl															
Technical Design															
Video Game Design		X	X	X			X	X	X	X	X		X	X	X
Website Design		X	X	X			X	X	X	X	X		X	X	X

AP COMPUTER SCIENCE STANDARDS – continued														
Event	Standard Number	AAP-3.B	AAP-3.C	AAP-3.D	AAP-3.E	AAP-3.F	AAP-4.A	AAP-4.B	CSN-1.A	CSN-1.B	CSN-1.C	CSN-1.D	CSN-1.E	CSN-2.A
Biotechnology														
Career Prep														
Challenging Technology Issues														
Chapter Team														
Children's Stories														
Coding								X						
Community Service Video														
Computer-Aided Design (CAD) Foundations														
Construction Challenge														
Cybersecurity								X	X	X			X	X
Data Science and Analytics									X	X			X	X
Digital Photography														
Dragster														
Electrical Applications														
Essays on Technology														
Flight														
Forensic Technology														
Foundations of Information Technology (FIT)									X	X	X	X	X	X
Inventions and Innovations														
Junior Solar Sprint														
Leadership Strategies														
Mass Production														
Mechanical Engineering														
Medical Technology														
Microcontroller Design		X	X	X			X			X			X	
Off the Grid														
Prepared Speech														
Problem Solving														
Promotional Marketing														
STEM Animation					X									
Structural Engineering														
System Control Technology		X	X	X			X		X	X			X	
Tech Bowl														
Technical Design														
Video Game Design		X	X	X			X							
Website Design														
IOC-1.A									X	X				
IOC-1.B										X				
IOC-1.C														
IOC-1.D														
IOC-1.E										X	X			
IOC-1.F											X	X		
IOC-2.A														

AP COMPUTER SCIENCE: COMPUTATIONAL THINKING PRACTICES**Practice 1: Computational Solution Design**

Design and evaluate computational solutions for a purpose.

- A. Investigate the situation, context, or task.
- B. Determine and design an appropriate method or approach to achieve the purpose.
- C. Explain how collaboration affects the development of a solution.
- D. Evaluate solution options.

Practice 2: Algorithms and Program Development

Develop and implement algorithms.

- A. Represent algorithmic processes without using a programming language.
- B. Implement and apply an algorithm.

Practice 3: Abstraction in Program Development

Develop programs that incorporate abstractions.

- A. Generalize data sources through variables.
- B. Use abstraction to manage complexity in a program.
- C. Explain how abstraction manages complexity.

Practice 4: Code Analysis

Evaluate and test algorithms and programs.

- A. Explain how a code segment or program functions.
- B. Determine the result of code segments.
- C. Identify and correct errors in algorithms and programs, including error discovery through testing.

Practice 5: Computing Innovations

Investigate computing innovations.

- A. Explain how computing systems work.
- B. Explain how knowledge can be generated from data.
- C. Describe the impact of a computing innovation.
- D. Describe the impact of gathering data.
- E. Evaluate the use of computing based on legal and ethical factors.

Practice 6: Responsible Computing

Contribute to an inclusive, safe, collaborative, and ethical computing culture.

- A. Collaborate in the development of solutions.
- B. Use safe and secure methods when using computing devices.
- C. Acknowledge the intellectual property of others.

AP Computer Science: Computational Thinking Practices																					
Event	Standard Number	1A	1B	1C	1D	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	5D	5E	6A	6B	6C
Biotechnology		X	X	X	X														X		X
Career Prep																					
Challenging Technology Issues																					
Chapter Team																					
Children's Stories																					
Coding				X	X		X				X	X	X						X		X
Community Service Video		X	X	X	X																
Computer-Aided Design (CAD) Foundations		X	X		X																
Construction Challenge																					
Cybersecurity		X	X	X	X								X					X	X	X	X
Data Science and Analytics		X	X	X	X		X		X	X					X			X	X		
Digital Photography																					
Dragster																					
Electrical Applications																					
Essays on Technology																					
Flight																					
Forensic Technology																					
Foundations of Information Technology (FIT)														X	X	X	X	X			
Inventions and Innovations																					
Junior Solar Sprint																					
Leadership Strategies																					
Mass Production																					
Mechanical Engineering																					
Medical Technology		X	X	X	X														X		X
Microcontroller Design		X	X	X	X						X	X	X						X		
Off the Grid																					
Prepared Speech																					
Problem Solving																					
Promotional Marketing																					
STEM Animation				X							X	X	X						X		X
Structural Engineering																					
System Control Technology		X	X	X	X						X	X	X						X		
Tech Bowl																					
Technical Design		X	X	X	X														X		
Video Game Design				X			X				X	X	X						X		X
Website Design				X							X	X	X						X		X

ISTE STANDARDS FOR STUDENTS – 2016 INTERNATIONAL SOCIETY FOR TECHNOLOGY IN EDUCATION

1. Empowered Learner

Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.

- articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes
- build networks and customize their learning environments in ways that support the learning process
- use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways
- understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies

2. Digital Citizen

Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical.

- cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world
- engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices
- demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property
- manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online

3. Knowledge Constructor

Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.

- plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits
- evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources
- curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions
- build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions

4. Innovative Designer

Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.

- know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems
- select and use digital tools to plan and manage a design process that considers design constraints and calculated risks
- develop, test and refine prototypes as part of a cyclical design process
- exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems

5. Computational Thinker

Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

- a. formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions
- b. collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making
- c. break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving
- d. understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

6. Creative Communicator

Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.

- a. choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication
- b. create original works or responsibly repurpose or remix digital resources into new creations
- c. communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations
- d. publish or present content that customizes the message and medium for their intended audiences

7. Global Collaborator

Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.

- a. use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning
- b. use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints
- c. contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal
- d. explore local and global issues and use collaborative technologies to work with others to investigate solutions

Although not formally aligned, this standards alignment of TSA competitive events has been developed in accordance with the ISTE Standards for Students framework. The ISTE Standards for Students are a framework for teaching and learning in the digital age and are adopted by schools, districts, states locally, nationally and internationally. The ISTE Standards for Students are a registered trademark of International Society for Technology in Education (ISTE). ISTE was not involved in the production of this product and does not endorse, support, or sponsor it.

ISTE STANDARDS FOR STUDENTS																													
Event	Standard Number	1a	1b	1c	1d	2a	2b	2c	2d	3a	3b	3c	3d	4a	4b	4c	4d	5a	5b	5c	5d	6a	6b	6c	6d	7a	7b	7c	7d
Biotechnology		X								X	X	X	X	X	X		X	X	X									X	X
Career Prep																													
Challenging Technology Issues																													
Chapter Team																													
Children's Stories																													
Coding					X																						X		
Community Service Video					X					X		X	X				X					X	X	X	X		X	X	X
Computer-Aided Design (CAD) Foundations					X									X	X							X	X	X	X				
Construction Challenge																													
Cybersecurity			X			X	X		X				X				X					X					X	X	X
Data Science and Analytics		X						X		X	X	X	X				X	X	X	X			X	X	X		X	X	X
Digital Photography					X					X																			
Dragster																													
Electrical Applications																													
Essays on Technology																													
Flight																													
Forensic Technology																													
Foundations of Information Technology (FIT)						X	X																						
Inventions and Innovations																													
Junior Solar Sprint																													
Leadership Strategies																													
Mass Production																													
Mechanical Engineering																													
Medical Technology		X			X					X	X	X	X	X	X	X	X	X	X	X			X	X	X		X	X	X
Microcontroller Design		X			X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X
Off the Grid																													
Prepared Speech																													
Problem Solving																													
Promotional Marketing								X														X	X	X					
STEM Animation		X			X			X						X								X	X	X	X		X	X	X
Structural Engineering																													
System Control Technology		X			X					X		X	X	X	X	X	X	X	X	X	X	X		X					X
Tech Bowl																													
Technical Design														X			X			X									
Video Game Design		X			X			X																				X	X
Website Design		X			X	X		X														X	X	X	X	X		X	X

CRITERIA FOR ACCREDITING ENGINEERING PROGRAMS (Accreditation Board for Engineering and Technology [ABET, Inc.])

Engineering programs must demonstrate that their students attain the following outcomes:

- A. An ability to apply knowledge of mathematics, science, and engineering
- B. An ability to design and conduct experiments, as well as to interpret data
- C. An ability to design a system, component, or process to meet desired needs
- D. An ability to function on multi-disciplinary teams
- E. An ability to identify, formulate, and solve engineering problems
- F. An understanding of professional and ethical responsibility
- G. An ability to communicate effectively
- H. The broad education necessary to understand the impact of engineering in global and social contexts
- I. A recognition of the need for and an ability to engage in life-long learning
- J. A knowledge of contemporary issues
- K. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

The outcomes listed are found in *2008-2009 Criteria for Accrediting Engineering Programs* and used with permission from the Engineering Accreditation Commission of ABET, Inc. The outcomes were designed for higher education engineering programs but are relevant for both middle school and high school level engineering-related courses.

CRITERIA FOR ACCREDITING ENGINEERING PROGRAMS (ABET, INC.)													
Standard	Event	Standard Letter	A	B	C	D	E	F	G	H	I	J	K
A. An ability to apply knowledge of mathematics, science, and engineering B. An ability to design and conduct experiments, as well as to interpret data C. An ability to design a system, component, or process to meet desired needs D. An ability to function on multi-disciplinary teams E. An ability to identify, formulate, and solve engineering problems F. An understanding of professional and ethical responsibility G. An ability to communicate effectively H. The broad education necessary to understand the impact of engineering in global and social contexts I. A recognition of the need for and an ability to engage in life-long learning J. A knowledge of contemporary issues K. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	Biotechnology		X	X	X	X	X	X	X	X		X	
	Career Prep		X					X	X	X			
	Challenging Technology Issues								X	X	X	X	
	Chapter Team									X	X		
	Children's Stories				X	X		X	X		X		
	Coding				X								
	Community Service Video					X			X		X		
	Computer-Aided Design (CAD) Foundations		X		X		X		X	X	X	X	X
	Construction Challenge		X			X		X	X				
	Cybersecurity			X	X	X	X	X	X	X	X	X	
	Data Science and Analytics		X	X					X	X		X	
	Digital Photography								X	X		X	X
	Dragster		X	X	X		X	X	X	X			X
	Electrical Applications		X	X	X		X				X	X	X
	Essays on Technology		X	X	X	X	X	X	X	X	X		
	Flight		X	X	X		X	X	X	X	X	X	X
	Forensic Technology		X	X					X	X		X	
	Foundations of Information Technology (FIT)		X	X	X	X	X	X	X	X	X	X	X
	Inventions and Innovations		X		X	X	X	X		X		X	
	Junior Solar Sprint		X	X	X			X		X			X
Leadership Strategies								X	X		X		
Mass Production		X	X	X	X	X	X	X	X	X			
Mechanical Engineering		X	X	X	X	X	X	X	X	X	X	X	
Medical Technology		X	X	X	X	X	X	X	X	X	X	X	
Microcontroller Design		X		X					X			X	
Off the Grid					X	X	X	X	X	X	X	X	
Prepared Speech									X	X	X		
Problem Solving		X	X	X			X		X				
Promotional Marketing		X						X	X				
STEM Animation				X	X	X	X		X			X	
Structural Engineering		X	X	X	X	X	X		X			X	
System Control Technology		X	X	X	X	X	X	X	X			X	
Tech Bowl		X	X	X			X			X		X	
Technical Design				X			X	X	X				
Video Game Design				X	X	X	X		X		X		
Website Design					X	X					X		

**NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS (NCTM)
PRINCIPLES AND STANDARDS FOR SCHOOL MATHEMATICS****A. Numbers and operations**

1. Understand numbers, ways of representing numbers, relationships among numbers, and number systems
2. Understand meanings of operations and how they relate to one another
3. Compute fluently and make reasonable estimates

B. Algebra

1. Understand patterns, relations, and functions
2. Represent and analyze mathematical situations and structures using algebraic symbols
3. Use mathematical models to represent and understand quantitative relationships
4. Analyze change in various contexts

C. Geometry

1. Analyze characteristics and properties of two- and three-dimensional geometric shapes, and develop mathematical arguments about geometric relationships
2. Specify locations and describe spatial relationships using coordinate geometry and other representational systems
3. Apply transformations and use symmetry to analyze mathematical situations
4. Use visualization, spatial reasoning, and geometric modeling to solve problems

D. Measurement

1. Understand measurable attributes of objects and the units, systems, and processes of measurement
2. Apply appropriate techniques, tools, and formulas to determine measurements

E. Data analysis and probability

1. Formulate questions that can be addressed with data, and collect, organize, and display relevant data to answer them
2. Select and use appropriate statistical methods to analyze data
3. Develop and evaluate inferences and predictions that are based on data
4. Understand and apply basic concepts of probability

F. Problem solving

1. Build new mathematical knowledge through problem solving
2. Solve problems that arise in mathematics and in other contexts
3. Apply and adapt a variety of appropriate strategies to solve problems
4. Monitor and reflect on the process of mathematical problem solving

G. Reasoning and proof

1. Recognize reasoning and proof as fundamental aspects of mathematics
2. Make and investigate mathematical conjectures
3. Develop and evaluate mathematical arguments and proofs
4. Select and use various types of reasoning and methods of proof

H. Communication

1. Organize and consolidate mathematical thinking through communication
2. Communicate mathematical thinking coherently and clearly to peers, teachers, and others
3. Analyze and evaluate the mathematical thinking and strategies of others
4. Use the language of mathematics to express mathematical ideas precisely

I. Connections

1. Recognize and use connections among mathematical ideas
2. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
3. Recognize and apply mathematics in contexts outside of mathematics

J. Representation

1. Create and use representations to organize, record, and communicate mathematical ideas
2. Select, apply, and translate among mathematical representations to solve problems
3. Use representations to model and interpret physical, social, and mathematical phenomena

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National Council of Teachers of Mathematics (NCTM) Principles and Standards for School Mathematics																																					
Event	Standard Number	A1	A2	A3	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	E1	E2	E3	E4	F1	F2	F3	F4	G1	G2	G3	G4	H1	H2	H3	H4	I1	I2	I3	J1	J2	J3	
Biotechnology												X	X														X			X				X			
Career Prep																																					
Challenging Technology Issues																											X	X									
Chapter Team																											X	X									
Children's Stories																																					
Coding																																					
Community Service Video			X																																		
Computer-Aided Design (CAD) Foundations									X	X		X	X																					X			
Construction Challenge													X	X							X																
Cybersecurity															X	X	X				X																
Data Science and Analytics	X		X		X		X								X	X		X						X	X		X	X			X	X	X	X	X		
Digital Photography																					X						X										
Dragster								X	X	X		X	X							X																	
Electrical Applications													X	X	X					X																	
Essays on Technology			X		X					X		X	X			X	X			X																	
Flight		X	X	X	X				X			X	X	X			X	X		X	X	X		X	X		X	X				X					
Forensic Technology															X						X																
Foundations of Information Technology (FIT)															X	X	X				X																
Inventions and Innovations																																					
Junior Solar Sprint	X	X	X						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Leadership Strategies																					X																
Mass Production													X	X						X	X																
Mechanical Engineering							X	X												X	X																
Medical Technology	X	X	X	X	X	X	X	X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Microcontroller Design																																					
Off the Grid												X	X							X																	
Prepared Speech																																					
Problem Solving													X	X					X	X																	
Promotional Marketing													X	X																							
STEM Animation	X		X			X														X						X			X							X	
Structural Engineering		X	X				X		X		X	X	X	X		X	X		X		X	X					X	X	X	X	X	X	X	X	X	X	
System Control Technology	X	X	X	X	X	X			X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Tech Bowl									X	X	X	X	X	X						X																	
Technical Design									X	X	X	X	X	X						X																X	
Video Game Design									X	X	X	X	X	X						X	X								X	X	X	X	X	X	X		
Website Design													X							X	X								X	X			X				

Choosing a career is one of the more important decisions made in life. This section of the guide may help students focus on career areas that appeal to them in the world of work, as well as show them how their involvement in TSA's program of activities has the ability to guide them toward those areas.

Career Clusters® are categories of similar occupations and industries. The Career Clusters® chart was developed by the U.S. Department of Education to organize career planning and help schools better prepare learners for their futures. The Career Clusters® chart offers general information about career categories and work opportunities prominent in those areas. The *TSA Competitions and the Career Clusters®* grid illustrates the interconnectedness between individual TSA competitions and the 16 Career Clusters®. Use these together as a starting point to help your students become informed about careers and develop a plan to reach their life goals.



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16 CAREER CLUSTERS®

A. AGRICULTURE, FOOD & NATURAL RESOURCES

- Agribusiness Systems
- Animal Systems
- Environmental Service Systems
- Food Products & Processing Systems
- Natural Resources Systems
- Plant Systems
- Power, Structural & Technical Systems Architecture & Construction

B. ARCHITECTURE & CONSTRUCTION

- Construction
- Design/Pre-Construction
- Maintenance/Operations

C. ARTS, A/V TECHNOLOGY & COMMUNICATIONS

- A/V Technology & Film
- Journalism & Broadcasting
- Performing Arts
- Printing Technology
- Telecommunications
- Visual Arts

D. BUSINESS MANAGEMENT & ADMINISTRATION

- Administrative Support
- Business Information Management
- General Management
- Human Resources Management
- Operations Management

E. EDUCATION & TRAINING

- Administration & Administrative Support
- Professional Support Services
- Teaching/Training

F. FINANCE

- Accounting
- Banking Services
- Business Finance
- Insurance
- Securities & Investments

G. GOVERNMENT & PUBLIC ADMINISTRATION

- Foreign Service
- Governance
- National Security
- Planning
- Public Management & Administration
- Regulation
- Revenue & Taxation

H. HEALTH SCIENCES

- Biotechnology Research & Development
- Diagnostic Services
- Health Informatics
- Support Services
- Therapeutic Services

I. HOSPITALITY & TOURISM

- Lodging
- Recreation, Amusements & Attractions
- Restaurants & Food/Beverage Services
- Travel & Tourism

J. HUMAN SERVICES

- Consumer Services
- Counseling & Mental Health Services
- Early Childhood Development & Services
- Family & Community Services
- Personal Care Services

K. INFORMATION TECHNOLOGY

- Information Support & Services
- Network Systems
- Programming & Software Development
- Web & Digital Communications

L. LAW, PUBLIC SAFETY, CORRECTIONS & SECURITY

- Correction Services
- Emergency & Fire Management Services
- Law Enforcement Services
- Legal Services
- Security & Protective Services

M. MANUFACTURING

- Health, Safety & Environmental Assurance
- Logistics & Inventory Control
- Maintenance, Installation & Repair
- Manufacturing Production Process Dev.
- Production
- Quality Assurance

N. MARKETING

- Marketing Communications
- Marketing Management
- Marketing Research
- Merchandising
- Professional Sales

O. SCIENCE, TECHNOLOGY, ENGINEERING & MATHEMATICS

- Engineering & Technology
- Science & Mathematics

P. TRANSPORTATION, DISTRIBUTION & LOGISTICS

- Facility & Mobile Equipment Maintenance
- Health, Safety & Environmental Management
- Logistics Planning & Management Services
- Sales & Service
- Transportation Operations
- Transportation Systems/Infrastructure
- Planning, Management & Regulation
- Warehousing & Distribution Center Operations

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More information on the Career Clusters® can be found at www.careertech.org.



TSA COMPETITIONS AND THE 16 CAREER CLUSTERS®

Event	Cluster letter	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Biotechnology									X							X	
Career Prep		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Challenging Technology Issues		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Chapter Team				X			X					X					X
Children's Stories			X		X					X					X		
Coding												X		X		X	
Community Service Video			X						X		X				X		
Computer-Aided Design (CAD) Foundations		X	X								X	X					
Construction Challenge		X											X				
Cybersecurity					X							X	X			X	
Data Science and Analytics		X				X	X	X			X	X	X	X	X	X	X
Digital Photography			X												X		
Dragster													X		X	X	X
Electrical Applications			X										X				
Essays on Technology			X	X			X					X		X			
Flight													X		X	X	
Forensic Technology												X			X		X
Foundations of Information Technology (FIT)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inventions and Innovations			X	X							X	X	X	X	X	X	
Junior Solar Sprint													X		X	X	
Leadership Strategies		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mass Production		X	X		X	X				X				X		X	
Mechanical Engineering		X							X			X	X			X	
Medical Technology								X		X		X			X		
Microcontroller Design												X				X	
Off the Grid		X	X														
Prepared Speech			X	X	X		X		X			X		X			
Problem Solving		X									X		X		X		
Promotional Marketing			X								X			X			
STEM Animation			X								X	X			X		
Structural Engineering		X										X			X	X	X
System Control Technology		X										X	X		X	X	X
Tech Bowl					X						X				X		
Technical Design		X	X								X	X			X		X
Video Game Design			X								X	X			X		X
Website Design			X								X	X			X		

MIDDLE SCHOOL COMPETITIVE EVENTS

NEW EVENTS

- Cybersecurity
- Data Science and Analytics
- Foundations of Information Technology (FIT)

REVISIONS

- Every event's guidelines have been revised in some form, whether in content or in format.
- In addition to specific event guidelines, advisors and participants must read the General Rules and Regulations in this guide.
- Every two years the specifics of many events are changed, keeping the competitions dynamic.

Biotechnology
 Career Prep
 Challenging Technology Issues
 Chapter Team
 Children's Stories
 Coding
 Community Service Video
 Computer-Aided Design (CAD) Foundations
 Construction Challenge
 Cybersecurity
 Data Science and Analytics
 Digital Photography
 Dragster
 Electrical Applications
 Essays on Technology
 Flight
 Forensic Technology
 Foundations of Information Technology (FIT)
 Inventions and Innovations
 Junior Solar Sprint
 Leadership Strategies
 Mass Production
 Mechanical Engineering
 Medical Technology
 Microcontroller Design
 Off the Grid
 Prepared Speech
 Problem Solving
 Promotional Marketing
 STEM Animation
 Structural Engineering
 System Control Technology
 Tech Bowl
 Technical Design
 Video Game Design
 Website Design

COMPETITIVE EVENTS ELIGIBILITY



2020 & 2021 MIDDLE SCHOOL COMPETITIONS	ELIGIBILITY
Each participant/team shall submit only one [1] entry for the following competitive events.	
Biotechnology	three (3) teams per state
Career Prep	one (1) individual per chapter
Challenging Technology Issues	three (3) teams of two (2) individuals per state
Chapter Team	one (1) team of six (6) individuals per chapter
Children's Stories	three (3) teams per state; individual entries are permitted
Coding	one (1) team of two (2) individuals per chapter
Community Service Video	one (1) team per chapter; individual entries are permitted
Computer-Aided Design (CAD) Foundations	two (2) individuals per state
Construction Challenge	one (1) team of two to four (2-4) individuals per chapter
Cybersecurity	two (2) individuals per chapter
Data Science and Analytics	three (3) teams of two to three (2-3) individuals per state
Digital Photography	three (3) individuals per state
Dragster	two (2) individuals per chapter
Electrical Applications	one (1) team of two (2) individuals per chapter
Essays on Technology	three (3) individuals per state
Flight	two (2) individuals per chapter
Forensic Technology	one (1) team of two (2) individuals per chapter
Foundations of Information Technology (FIT)	two (2) individuals per chapter
Inventions and Innovations	one (1) team of at least three (3) individuals per chapter
Junior Solar Sprint	one (1) team of two to four (2-4) individuals per chapter
Leadership Strategies	three (3) teams of three (3) individuals per state
Mass Production	one (1) team of at least two (2) individuals per chapter
Mechanical Engineering	one (1) team of at least three (3) individuals per chapter
Medical Technology	three (3) teams of at least two (2) individuals per state
Microcontroller Design	one (1) team per chapter; individual entries are permitted
Off the Grid	three (3) teams per state; individual entries are permitted
Prepared Speech	three (3) individuals per state
Problem Solving	one (1) team of two (2) individuals per chapter
Promotional Marketing	one (1) individual per chapter
STEM Animation	three (3) teams per state
Structural Engineering	one (1) team of two (2) individuals per chapter
System Control Technology	one (1) team of three (3) individuals per state
Tech Bowl	one (1) team of three (3) individuals per chapter
Technical Design	one (1) team of two (2) individuals per chapter
Video Game Design	one (1) team of at least two (2) individuals per chapter
Website Design	one (1) team of at least three (3) individuals per chapter



TSA COMPETITIVE EVENTS RATING FORM/RUBRIC

The Technology Student Association (TSA) Middle School Competitive Events Guide for the 2020 & 2021 National TSA Conferences contains a rating form (rubric) for each competition. Rubrics are embraced by STEM educators because they provide a way to evaluate performance. The use of descriptors for each criterion being measured in a rubric increases consistency and a greater understanding of the evaluation process. The TSA rating form/rubric provides a way for TSA members to better prepare for competitions, for advisors to carefully assist them in the process, and for judges to effectively evaluate participants and their entries.

GO/NO GO SPECIFICATIONS

- Each competitive event has a Go/No Go Specifications checklist placed at the beginning of the official event rating form/rubric.
- Specifications in the checklist are required and must be met, or the individual or team will not be allowed to compete in the event.
- Refer to each competitive event's official rating form/rubric for details.



OVERVIEW

Applying leadership and 21st century skills, participants conduct research on a contemporary biotechnology issue of their choosing, document their research, and create a display. The information gathered may be student-performed research or a re-creation or simulation of research performed by the scientific community. If appropriate, a model or prototype depicting some aspect of the issue may be included. Semifinalists present and are interviewed about their topic.

ELIGIBILITY

Three (3) teams per state may participate.

TIME LIMITS

Ten (10) minutes are allowed for the semifinal presentation/interview broken down as follows:

- A. one (1) minute for set-up
- B. seven (7) minutes for the presentation
- C. two (2) minutes to respond to questions from judges

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants select a contemporary issue concerning biotechnology.
- B. Participants research the issue using credible sources.
- C. Participants prepare their display and documentation portfolio according to the regulations.

PRELIMINARY ROUND

- A. No more than two (2) team representatives report at the time and place stated in the conference program to set up the display.
- B. Entries are evaluated by the judges with neither students nor advisors present based on the following criteria:
 - 1. Judges score the Display criteria to determine the top twenty-four (24) preliminary contestants, which will not be posted.

- 2. Judges score the Documentation criteria of those top twenty-four contestants to determine the top twelve (12) semifinalists.

- C. A list of twelve (12) semifinalist teams (in random order) is posted.

SEMIFINAL ROUND

- A. Up to two (2) representatives from each semifinalist team report at the time and place stated in the conference program to sign up for a presentation time.
- B. Two (2) representatives of each semifinalist team report at the assigned time and place for the presentation.
- C. Semifinalists team representatives participate in an on-site presentation/interview that lasts a maximum of ten (10) minutes (refer to time limits).
- D. Participants pick up their entry from the display area at the time and place stated in the conference program.
- E. Ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRE-CONFERENCE

- A. Students must understand the fundamental concepts and principles of the contemporary biotechnology issue they research. Research about the issue should focus on significant impacts (opportunities and risks) on the environment, economy, and society, as well as any important ethical considerations.
- B. Display guidelines:
 - 1. The size of the display may not exceed 15" deep x 3' wide x 4' high.
 - 2. Models or prototypes must fit within the allotted display space (optional).
 - 3. A/C electricity may not be used.

4. Dry cell or photo-voltaic cells may be used for power, if desired.
5. Any power source used must fit within the maximum display area.
6. If operating instructions are necessary, they must be clearly displayed.
7. Violation of the following will result in disqualification:
 - a. No viruses, live plants, or animals may be used as a part of the display.
 - b. No harmful or illegal substances may be displayed.

C. Documentation Portfolio:

1. Documentation materials (comprising “a portfolio”) are required and must be secured in a [clear front report cover](#) with the following single-sided, 8½" x 11" pages, in this order:
 - a. Title page that includes the event title, the conference city and state, the year, and the team/chapter ID number; one (1) page
 - b. Table of contents
 - c. Definition and explanation of the issue; one (1) page
 - d. Research base: An explanation of the importance of the issue in human life today, including possible problems and solutions; maximum three (3) pages.
 - e. Support materials such as logs, graphs, sketches, drawings, illustrations, photographs, etc.; maximum four (4) pages
 - f. Plan of Work log (see Forms Appendix)
 - g. A list of references and credible resources; a minimum of three (3) different types of resources must be used; pages as needed.
 - h. Work must be original or cited using proper MAL format. For details, refer to the General Rules and Regulations.

SEMIFINAL ROUND

- A. No more than two (2) team representatives participate in a presentation/interview.
- B. Representatives may reference their display and documentation during the presentation/interview.

EVALUATION

PRELIMINARY ROUND

- A. The display
- B. The documentation portfolio

SEMIFINAL ROUND

- A. The presentation
- B. The interview

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Botanist
- Chemical engineer
- Food scientist
- Molecular biologist
- Plant geneticist

BIOTECHNOLOGY

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ Display is present
- ☐ Documentation portfolio is present
- ☐ ENTRY NOT EVALUATED

DISPLAY (90 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Definition and Explanation of the Issue and Solution (X1)	Unclear definition and explanation of the issue are evident; it is difficult to understand the solution being communicated; an illogical explanation is presented.	Issue is defined and explained adequately; the solution is acceptable.	There is evidence of a clear and concise definition and explanation of the issue; explanation is presented and communicated in an organized and concise manner.	
Explanation of Impacts (X2)	Explanation is missing a discussion of the issue's relevance to environmental, economic, social, and/or ethical considerations.	Explanation addresses some of the issue's relevance to environmental, economic, social, and/or ethical considerations.	Explanation includes a full discussion of the issue's relevance to environmental, economic, social, and/or ethical considerations.	
Supporting Information (X1)	Support information does not help to clarify documentation, and/or it is of little significance to the issue.	Support information is appropriate and helps supplement the documentation by providing clarity to the issue.	Support information is highly effective and of excellent quality.	
Research, References, and Resources (X1)	Documentation lacks an adequate research base, and/or very few credible sources are referenced.	Research is generally appropriate, with adequate credible sources.	A comprehensive research base that includes credible sources is evident.	
Communication of Issue (X1)	It is difficult to understand the issue being communicated; an illogical explanation is presented.	The issue is communicated and thoughts are somewhat organized.	The issue is communicated in an organized, clear, and concise manner.	
Communication of Solution (X1)	It is difficult to understand the solution being communicated; an illogical explanation is presented.	The solution is communicated and thoughts are somewhat organized.	The solution is communicated in an organized, clear, and concise manner.	
Creativity (X1)	The display lacks creativity; no, or very few, design principles are integrated in the display.	Some elements of creativity exist in the display, and essential design principles are generally evident.	The display exudes creativity; essential design principles and elements are well integrated.	
Aesthetics and Artanship (X1)	Display is unorganized and sloppy; display seems to be an afterthought or thrown together.	Display is somewhat organized and aesthetically pleasing.	Display is logical, organized, cohesive, and aesthetically pleasing.	
DISPLAY SUBTOTAL (90 points)				

DOCUMENTATION PORTFOLIO (50 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Portfolio (X1)	Portfolio is unorganized and/or missing three (3) or more components.	Portfolio has most components and it is somewhat organized.	Only one (1) or none of the components are missing in the portfolio; content and organization are clearly evident.	
Definition and Explanation of Issue (X1)	Definition and explanation of the issue are unclear.	Issue is generally defined and explained, but some points could use additional clarification.	Clear and concise definition and explanation of the issue are evident.	
Research Base (X1)	Research is inadequate, and/or very few credible sources are referenced.	Research has been conducted appropriately, with some credible sources included.	Research indicates evidence of a comprehensive assortment of materials that are credible sources.	
Support Materials (X1)	Support materials do not help clarify the documentation or are of little significance to the issue.	Support materials are somewhat appropriate and lend some clarity to the issue.	Support materials are of excellent quality; if not original, they are cited; support materials clarify the issue.	
Quality and Effectiveness (X1)	Portfolio appears to have been thrown together; distracting errors in punctuation, grammar, and spelling are evident in the documentation.	Portfolio is generally organized; punctuation, grammar, and spelling are correct for the most part, with few errors.	Work is of exceptional quality and well organized; punctuation, grammar, and spelling are correct, with no errors.	
DOCUMENTATION SUBTOTAL (50 points)				
Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right. Indicate the rule violated: _____				
PRELIMINARY SUBTOTAL (140 points)				

SEMIFINAL PRESENTATION/INTERVIEW (60 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Organization (X1)	Participants seem unorganized and unprepared for the presentation/ interview, with an illogical explanation of the problem and solution.	Participants are generally prepared for the presentation/interview; the explanation of problem and solution are somewhat communicated and organized.	The presentation/interview is logical, well organized, and easy to follow; the problem and solution are communicated in an organized and concise manner.	
Articulation (X1)	Communication of the solution is unclear, unorganized, and/or illogical; leadership and/or 21 st century skills are not evident.	Communication of the solution is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the solution is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
Delivery (X1)	The team is verbose and/or uncertain in its presentation/ interview; participants' posture, gestures, and lack of eye contact diminish the delivery.	The team is generally well-spoken and clear in its presentation/ interview; participants' posture, gestures, and eye contact result in an acceptable delivery.	The team is well-spoken and distinct in its presentation/interview; participants' posture, gestures, and eye contact result in a polished, natural, and effective delivery.	

SEMIFINAL PRESENTATION/INTERVIEW (60 points) – continued

Knowledge (X2)	Participants seem to have little understanding of the concepts in their project; answers to questions may be vague.	Participants exhibit an understanding of the concepts in their project.	Participants show clear evidence of a thorough understanding of the project.	
Team Participation (X1)	The majority of the presentation/ interview is made by one member of the team; the partner(s) may be disengaged.	Team members generally are engaged in the process, though one member may take on more responsibility than the other(s).	All team members are actively involved in the presentation/ interview.	
SEMIFINAL PRESENTATION/INTERVIEW SUBTOTAL (60 points)				

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

SEMIFINAL SUBTOTAL (60 points)

To arrive at the **TOTAL** score, add any subtotals and subtract rules violation points, as necessary. **TOTAL (200 points)**

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

BIOTECHNOLOGY

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more (preferably the same judges from the preliminary round)
- C. Assistant, one (1)

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stick-on labels for identifying entries
 - 5. Results envelope with coordinator forms
- B. Measuring tape for judges
- C. Display tables for entries
- D. Table and chairs for event coordinator and judges

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, tables, chairs, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is to begin, meet with judges and assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

EVENT CHECK-IN

- A. Check in the entries at the time and place stated in the conference program.
- B. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.
- C. In order to compete, participants must be on the entry list or must have CRC approval.
- D. Requirements for attire do NOT apply during check-in, only on the first day of the conference.
- E. Each entry must include the team's identification number in the upper right-hand corner of the entry.
- F. Instruct participants to position displays for viewing.

PRELIMINARY ROUND

- A. Judges independently assess the entries following the below criteria:
 - 1. Judges score the Display criteria to determine the top twenty-four (24) preliminary contestants, which will not be posted.
 - 2. Judges score the Documentation criteria of those top twenty-four contestants to determine the top twelve (12) semifinalists.
- B. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry

The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- C. Judges determine the twelve (12) semifinalists.
- D. Submit the finalist results and all related forms in the results envelope to the CRC room.
- E. Create a sign-up sheet for the presentation/interviews.

SEMIFINAL ROUND

- A. Semifinalists report at the time and place stated in the conference program to sign-up for the presentation/interview.
- B. Participants report at the assigned time and place stated in the conference program for the presentation/interview.
- C. Manage the presentations/interviews.
- D. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- E. Judges determine the ten (10) finalists and discuss and break any ties.
- F. Submit the finalist results and all related forms in the results envelope to the CRC room.
- G. If necessary, manage security and the removal of materials from the event area.

OVERVIEW

Applying leadership and 21st century skills, participants conduct research on a technology-related career according to a theme posted on the [TSA website](#), and prepare a letter of introduction and a chronological skills resume. Semifinalists participate in a mock interview.

ELIGIBILITY

One (1) individual per chapter may participate.

TIME LIMITS

PRELIMINARY ROUND

- A. All components of the chapter's entry must be finished, submitted, and accessible via the Internet by 11:59 p.m. ET on May 15th.
- B. Entries received, or changes made to submitted entries after this deadline will not be judged.
- C. Email verification of each team's entry will be made by June 10th.

SEMIFINAL ROUND

- A. Ten (10) minutes is allowed for the mock interview.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants access the annual theme posted on the [TSA website](#).
- B. Participants concentrate their efforts conducting research on the selected technology-related career.
- C. Participants prepare a letter of introduction and a chronological skills resume.
- D. Participants submit the entry by 11:59 p.m. ET on May 15th.
- E. Submission information will be provided on the [TSA website](#) under Competition Updates.

PRELIMINARY ROUND

- A. A list of twelve (12) semifinalist teams (in random order) is posted on the first full day of conference.

SEMIFINAL ROUND

- A. Semifinalists report at the time and place stated in the conference program to sign up for a mock interview time.
- B. Semifinalists report at the assigned time and place to participate in the mock interview.
- C. **Simulating a real interview, semifinalists bring with them an additional printed copy of their resume to the judges at the time of the interview.**
- D. Judges evaluate the interviews.
- E. Ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRE-CONFERENCE

- A. Participants enter this event with the following scenario in mind:
 - 1. You have graduated from high school and have the appropriate level of education and training (i.e. college degree, technical school, certification and training, etc.) for an entry-level position that is required for successful employment in your selected career.
 - 2. Your training, education, and other qualifications for the entry-level position are realistic for successful employment in your chosen career and are reflected in your resume and letter of introduction.
- B. Participants should use fictitious home address and telephone number information when completing the documents, **however, correct participant names must be used.**

- C. Each participant submits a PDF of:
1. The letter of introduction:
 - a. Must be typed
 - b. Is limited to one (1) single-sided, 8½" x 11" page
 - c. Must include an opening, body, and conclusion
 2. The job-specific resume:
 - a. Must be typed
 - b. Is limited to two (2) single-sided, 8½" x 11" pages

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the career areas featured in the TSA AND CAREERS section of this guide.

EVALUATION

PRELIMINARY ROUND

- A. The resume and letter of introduction

SEMIFINAL ROUND

- A. The mock interview

Refer to the official rating form for more information

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREER PREP

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

☐ Documentation was submitted and scored

☐ ENTRY NOT EVALUATED

LETTER OF INTRODUCTION (40 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Introduction (X1)	Introduction fails to describe the participant, and/or does not clearly identify the position or reason for contact, and/or does not indicate how the position was discovered, and/or does not indicate interest, and/or does not grab the employer's attention.	Introduction describes many of the elements (e.g., participant description, how the position was identified, reason for applying, etc.) and briefly addresses others (e.g., how the position was discovered, interest level, etc.), resulting in an adequate introduction.	Introduction incorporates all elements—the participant, the position or reason for contact, how the position was discovered, and genuine interest in the position—and ultimately grabs the employer's attention.	
Body (identification of skills) (X1)	Participant fails to identify any skills or qualifications, does not explain interest, and does not indicate how his/her skills would provide benefit to the company.	Participant indicates his/her skills, with a general explanation of how the skills relate to the position at hand; participant conveys interest, and briefly connects the skills to benefits for the company.	Participant provides one or two strong qualifications and clearly relates these skills to the job at hand; participant clearly explains how his/her interest and skills can benefit the company.	
Conclusion (X1)	The conclusion does not include a thank-you to the employer and/or, does not note contact information, is not assertive, and/or lacks mention of follow-up after a given period of time.	The conclusion may or may not include a thank-you and follow-up to the employer with contact information; overall, it is adequate.	The conclusion includes a thank-you to the employer for his/her time and the applicant's contact information; it is assertive and mentions a method of follow-up within a given period of time.	
Overall Writing Quality and Grammar (X1)	Writing does not make sense; participant has written too much or too little; there are multiple spelling and grammatical errors.	Writing is average and includes relevant information and content; it is somewhat convincing to an employer; there are minor spelling or grammatical errors.	Writing flows well, is clear, concise, and gets right to the point; it is convincing and contains no spelling or grammatical errors.	
LETTER OF INTRODUCTION SUBTOTAL (40 points)				

RESUME (40 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Audience and Purpose (X1)	Resume does not address a particular audience; the purpose is not clearly stated; revision is needed.	Audience and purpose are generally implied; the resume is somewhat tailored to the employer.	Audience is clearly addressed and the resume is tailored to the employer; the purpose is clearly stated.	
Presentation and Format (X1)	Resume does not have a clear design format; headers are not used or are used incorrectly or inappropriately; resume does not use reverse chronological format.	Resume attempts (and partially succeeds) to use a reverse chronological format; headers are used for a somewhat professional and concise presentation.	Resume follows a reverse chronological format; it uses clear and appropriate headers to organize information; it has a professional appearance.	
Language and Style (X1)	Participant fails to use action words; phrasing is wordy and lacks focus.	Participant uses some action words and some concise and clear words in most of the resume.	Participant consistently uses strong, clear, and concise words throughout the resume.	
Overall Writing Quality and Grammar (X1)	Writing does not make sense; participant has written too much or too little; there are multiple spelling and grammatical errors.	Writing is average and includes relevant information and content; it is somewhat convincing to an employer; there are minor spelling or grammatical errors.	Writing flows well, is clear, concise, and gets right to the point; it is convincing and contains no spelling or grammatical errors.	
RESUME SUBTOTAL (40 points)				
Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right. Indicate the rule violated: _____				
PRELIMINARY SUBTOTAL (80 points)				

SEMIFINAL MOCK INTERVIEW (50 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Organization (X1)	Participant is unorganized and unprepared for the interview; an illogical explanation of the career choice is presented.	Participant is generally prepared for the interview; an explanation of the career choice is somewhat communicated and organized.	Interview is logical, well organized, and easy to follow; the career choice is communicated in an organized and concise manner.	
Knowledge (X2)	Participant seems to have little understanding of the concepts in the career choice; answers to questions may be vague.	Participant exhibits a general understanding of the career choice.	Participant shows clear evidence of a thorough understanding of the career choice.	
Delivery (X1)	Participant is verbose and/or uncertain in the interview; participant's posture, gestures, and lack of eye contact diminish the interview.	Participant is somewhat well-spoken and clear in the interview; participant's posture, gestures, and eye contact are acceptable in the interview.	Participant is well-spoken and clear in the interview; participant's posture, gestures, and eye contact result in a polished, natural, and effective interview.	

SEMIFINAL MOCK INTERVIEW (50 points) – continued				
Articulation (X1)	Communication is full of illogical thoughts that lack clarity, and/or there is insufficient information provided about the career choice; leadership and/or 21 st century skills are not evident.	Communication is somewhat logical, easy-to-follow, and/or there is sufficient information provided describing the career choice; leadership and/or 21 st century skills are somewhat evident.	Communication is clear and concise, and there is ample information provided about the career choice; leadership and/or 21 st century skills are clearly evident.	
SEMIFINAL MOCK INTERVIEW SUBTOTAL (50 points)				
<p>Rules violations (a deduction of 20% of the total possible points in the semifinalist sections above) must be initialed by the evaluator, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
SEMIFINAL SUBTOTAL (50 points)				
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.</p>				TOTAL (130 points)

Comments:

 I certify these results to be true and accurate to the best of my knowledge.
JUDGE

Printed name: _____ Signature: _____

CAREER PREP

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more (preferably the same judges who reviewed the written entries)
- C. Assistants, two (2)

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Results envelope with coordinator forms
- B. Interview questions appropriate to the annual selection of technology-related careers
- C. Stapler and staples
- D. Tables and chairs for event coordinator, judges, and participants

RESPONSIBILITIES

PRE-CONFERENCE

- A. National TSA will collect entries until 11:59 p.m. ET on May 15th and send out receipt confirmations to participants. The results are shared with the CRC manager, event coordinator, and assigned judges.
- B. Review entries as they are submitted to the designated online storage utility.
- C. Manage communication and pre-conference evaluation (at least two [2] or more judges should be recruited earlier in the year). Coordinate with the Judge Manager.
- D. Judges determine the twelve (12) semifinalists and discuss and break any ties.

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.

- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, tables, chairs, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is to begin, meet with judges and assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRELIMINARY ROUND

- A. On the first full day of the conference, post a list of the twelve (12) semifinalists in random order.
- B. Create a sign-up sheet for semifinal mock interviews.

SEMIFINAL ROUND

- A. Semifinalists report at the time and place stated in the conference program to sign-up for the mock interview.
- B. Semifinalists report at the assigned time and place for the mock interview.
- C. Manage the interviews.
- D. Judges use the same official rating form for both the preliminary and semifinal round of judging.
- E. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry
 The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- F. Judges determine the ten (10) finalists and discuss and break any ties.
- G. Submit the finalist results and all related forms in the results envelope to the CRC room.
- H. If necessary, manage security and the removal of materials from the event area.

CHALLENGING TECHNOLOGY ISSUES



OVERVIEW

Applying leadership and 21st century skills, participants collaborate to prepare and deliver a debate-style presentation with participants explaining opposing views of a current technology issue. The annual topics will be posted on the [TSA website](#) under Competitions/Themes and Problems.

ELIGIBILITY

Three (3) teams of two (2) individuals per state may participate.

TIME LIMITS

- A. Fifteen (15) minutes is allowed to prepare.
- B. A minimum of two (2) minutes and a maximum of four (4) minutes is allowed to present.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRELIMINARY ROUND

- A. Both members of the team must report at the time and place stated in the conference program to receive an assigned presentation time.
- B. Both members must report with their materials to the preparation room at the assigned time.
- C. Using a random draw procedure:
 - 1. The coordinator draws one (1) topic from those posted on the [TSA website](#) under Competitions/Themes and Problems.
 - 2. The topic is written on index cards and given to each team in the preparation room.
- D. At the end of the fifteen (15)-minute preparation time, each team is escorted to the presentation room where the team presents opposing views of the selected issue.
- E. A list of twelve (12) semifinalist teams (in random order) is posted.

SEMIFINAL ROUND

- A. A representative from each semifinalist team reports at the time and place stated in the conference program to sign up for a presentation time.
- B. Semifinalist teams report to the preparation room at their assigned time for the same procedure used in the preliminary round.
- C. Ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

- A. The same regulations apply to both the preliminary and semifinal rounds of judging for this event.
- B. Materials:
 - 1. Team members may bring non-electronic reference materials for use while in the preparation room.
 - 2. No other form of assistance is allowed.
 - 3. Participants must provide their own pencils or pens for this event.
 - 4. Participants may provide note cards, if desired.
- C. Note cards:
 - 1. Note cards may be used during the presentation.
 - 2. The use of note cards may result in score deductions if they detract from the effectiveness of the presentation.
- D. Event debate:
 - 1. Using leadership and/or 21st century skills, the team presents on one (1) topic from the topics posted on the [TSA website](#) under Competitions/Themes and Problems.

2. Team may use first names ONLY and no other identifying information during their presentation.
3. Each team states the selected topic/issue when prompted by the judges.
4. After stating the selected issue, the presentation time begins once a team member begins to speak.
5. Teams present opposing views of the selected issue in debate style.
6. Teams may use the following suggested format to present opposing views:
 - Introduction (pro) Introduction (con)
 - Position (pro) Position (con)
 - Conclusion (pro) Conclusion (con)
7. A timekeeper notifies a presenting team thirty (30) seconds before the end of the four (4)-minute time limit by holding up a “30-seconds remaining” card.
8. Time is called at four (4) minutes, at which time the presentation must stop. No overtime speaking is allowed.

EVALUATION

A. The debate

Note: Scores are reset for the semifinal round and are not added to the preliminary scores.

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Lobbyist
- Management executive
- Motivational speaker
- Politician
- Public policy specialist

CHALLENGING TECHNOLOGY ISSUES

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

☐ A team of two (2) individuals is present

☐ ENTRY NOT EVALUATED

PRO SIDE (70 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Introduction (X1)	Introduction does not show an attempt to get the attention of the audience, and/or it does not outline points clearly and distinctly.	Introduction shows an effort to grab the attention of the audience; previewing points are somewhat organized in a logical manner.	Introduction employs an attention-getter, clearly states the thesis, and previews main points of the issue.	
Organization (X1)	Ideas may not be focused or developed; the main purpose is not clear; there are no transitions.	The main idea is evident, and the organizational structure is generally strong; ideas are relevant and flow smoothly.	Ideas are clearly organized, developed, and supported, with smooth transitions.	
Topic Knowledge (X1)	Team does not have a grasp of the topic; inaccurate, generalized, or inappropriate support material is used; over dependence on notes is evident.	Team demonstrates a simple grasp of the topic; support material is stated; the team is at ease when it elaborates on the topic.	Team exhibits full knowledge and a clear grasp of the topic; support material is introduced and referenced accurately.	
Conclusion (X1)	Conclusion ends abruptly (no logical and/or organized conclusion is presented); it does not restate main points of the position.	Conclusion is somewhat engaging; it restates main points and wraps up the position on the topic.	Conclusion is engaging and restates main points of the topic in a comprehensive, competent, and articulate way, reinforcing the team's understanding of the subject; the position is well stated and closes with a connection to the introduction.	
Voice and Language (X1)	Vocabulary choice may be limited; speech is peppered with slang or jargon; voice is dull; language is questionable or inappropriate for the setting.	Presentation is respectful; language is appropriate for the setting and word choices are generally precise; voice is appropriate.	Language is appropriate for the setting and voice tone and pitch energize the presentation; vocabulary choices are vivid and precise.	
Delivery (X2)	Delivery detracts from the message; eye contact may be limited; presenters may tend to look at the floor, mumble, speak inaudibly, fidget, or read from cards; gestures and movements may be excessive.	Delivery is appealing, though some hesitancy may be observed; posture, eye contact, gestures, facial expressions, volume, pace, etc., do not detract from the message.	Delivery is natural, confident, and enhances the message; posture, eye contact, gestures, facial expressions, volume, pace, etc., indicate confidence.	
PRO SIDE SUBTOTAL (70 points)				

CON SIDE (70 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Introduction (X1)	Introduction does not show an attempt to get the attention of the audience and/or does not outline points clearly and distinctly.	Introduction shows the effort to grab the attention of the audience; previewing points are somewhat organized in a logical manner.	Introduction employs an attention-getter, clearly states the thesis, and previews main points of the issue.	
Organization (X1)	Ideas may not be focused or developed; the main purpose is not clear; main points are difficult to identify; there are no transitions.	The main idea is evident, and the organizational structure is generally strong; ideas are relevant and flow smoothly.	Ideas are clearly organized, developed, and supported, with smooth transitions.	
Topic Knowledge (X1)	Team does not have a grasp of the topic; inaccurate, generalized, or inappropriate support material is used; over dependence on notes is evident.	Team has a simple grasp of the topic; support material is stated; the team is at ease when it elaborates on the topic.	Team exhibits full knowledge and a clear grasp of the topic; support material is introduced and referenced accurately.	
Conclusion (X1)	Conclusion ends abruptly (no logical and/or organized conclusion is presented); it does not restate main points of the position.	Conclusion is somewhat engaging; it restates main points and wraps up the position on the topic.	Conclusion is engaging and restates main points of the topic in a comprehensive, competent, and articulate way, reinforcing the team's understanding of the subject; the position is well stated and closes with a connection to the introduction.	
Voice and Language (X1)	Vocabulary choice may be limited; speech is peppered with slang or jargon; voice is dull; language is questionable or inappropriate for the setting.	Presentation is respectful; language is appropriate for the setting and word choices are generally precise; voice is appropriate.	Language is appropriate for the setting and voice tone and pitch energize the presentation; vocabulary choices are vivid and precise.	
Delivery (X2)	Delivery detracts from the message; eye contact may be limited; presenters may tend to look at the floor, mumble, speak inaudibly, fidget, or read from note cards; gestures and movements may be excessive.	Delivery is appealing, though some hesitancy may be observed; posture, eye contact, gestures, facial expressions, volume, pace, etc. do not detract from the message.	Delivery is natural, confident, and enhances the message; posture, eye contact, gestures, facial expressions, volume, pace, etc. indicate confidence.	
CON SIDE SUBTOTAL (70 points)				

PARTICIPATION (10 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Team Member Participation (X1)	One team member does the majority of the speaking and/or debating on the topic; the other member seems disengaged from the presentation; leadership and/or 21 st century skills are not evident.	Both team members are engaged in the debate, but one clearly takes the lead; the other member only replies to or refutes statements; leadership and/or 21 st century skills are somewhat evident.	Both team members are actively involved in the presentation, debate, and rebuttals of the topic; shared responsibility is evident throughout; leadership and/or 21 st century skills are clearly evident.	
PARTICIPATION SUBTOTAL (10 points)				

<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>	
--	--

To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.

TOTAL (150 points)

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

CHALLENGING TECHNOLOGY ISSUES

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more per heat
 - 2. Semifinal round, two (2) or more per heat
- C. Assistants, two (2) per preparation room
- D. Timekeeper, one (1) per presentation room

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Results envelope with coordinator forms
 - 5. List of participating teams
 - 6. A time sign-up sheet
- B. Lined paper and 3" x 5" note cards
- C. Stopwatch, one (1) per preparation room and one (1) for the presentation room per heat; one (1) set for the semifinal round
- D. Written topic/issue selections
- E. A card with "30 seconds remaining" printed clearly, one (1) per presentation room
- F. Tables and chairs for event coordinator, judges, and participants

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.

- D. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, chairs, tables, etc. Notify the event manager of any potential problems.
- E. One (1) hour before the event is scheduled to begin, meet with judges and assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRESENTATION TIME SIGN-UP

- A. Check in the teams at the time stated in the conference program.
- B. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.
- C. In order to compete, participants must be on the entry list or must have approval of the CRC.
- D. Requirements for attire do NOT apply during check-in, only on the first day of the conference.
- E. When the teams report to the event area:
 - 1. Assign times for their presentations. Times should be scheduled at ten (10)-minute intervals.
 - 2. Depending upon the number of entries, heats may be necessary to determine semifinalists.

PRELIMINARY ROUND

- A. Preparation:
 - 1. After each team reports to the preparation room at the assigned time and participants have been seated, review the time limits and distribute paper.
 - 2. Present the team with the topic selected.
 - 3. Start the time and inform participants of the end of the preparation time.
 - 4. Monitor students during the preparation time and supply extra paper if needed.
 - 5. At the end of the 15-minute preparation time, collect the topic and escort the team to the presentation room.

- B. Presentation:
 - 1. After the team is in position, introduce the team by entry number only. Please note that team members may use first names only and no other identifying information during their presentation.
 - 2. Judges tell the team to start, and timing the event begins.
 - 3. The timekeeper notifies the team thirty (30) seconds before the end of the four (4)-minute time limit by holding up a “30 seconds remaining” card.
 - 4. Time is called at four (4) minutes, at which point the speakers must stop.
- C. Judges independently assess the entries.
- D. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry

The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- E. Judges determine the twelve (12) semifinalists.
- F. Submit the semifinalist results to the CRC room for posting.
- G. Create a semifinalist sign-up sheet for final presentations.
- F. Judges determine the ten (10) finalist teams and discuss and break any ties.
- G. Submit the finalist results and all related forms in the results envelope to the CRC room.
- H. If necessary, manage security and the removal of materials from the area.

SEMIFINAL ROUND

- A. At least one (1) hour before the event begins, meet with judges/assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.
- B. Semifinalist teams report at the time and place stated in the conference program to sign up for a presentation time.
- C. Oversee semifinalist presentations, following the same procedure used in the preliminary round.
- D. Use the same official rating form for both the preliminary and semifinal rounds of evaluation.
- E. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.

CHAPTER TEAM



OVERVIEW

Participants take a written parliamentary procedures test in order to qualify for the semifinals. Applying leadership and 21st century skills, semifinalist teams are challenged to complete an opening ceremony, items of business, parliamentary actions, and a closing ceremony within a specified time period.

ELIGIBILITY

- A. Participants are limited to one (1) team of six (6) individuals per chapter.
- B. Team members do not have to be elected officers of the local chapter.
- C. Teams that take the test and advance to the semifinalist portion of the event must be comprised of the same six (6) members.

TIME LIMITS

PRELIMINARY ROUND

- A. All teams are allowed one (1) hour to complete a written parliamentary procedures test.

SEMIFINAL ROUND

- A. Teams have fifteen (15) minutes with no penalty, and up to seventeen (17) minutes with penalty (see Time over chart) to complete required parliamentary actions, items of business, set-up time, and a presentation.
- B. The time begins when the team is handed the event materials; the time ends when the gavel is rapped to close the meeting, or at seventeen (17) minutes (at that point all team members other than the secretary must leave the room. The secretary may then be taken to another room to complete the minutes).
- C. The secretary has five (5) additional minutes to complete the minutes of the meeting.

- D. Teams are penalized five (5) points per thirty (30) seconds for going over the allotted time, based on the following scale:

Time over fifteen (15) minutes	Penalty
15:01 to 15:30	five (5) points per evaluator
15:31 to 16:00	ten (10) points per evaluator
16:01 to 16:30	fifteen (15) points per evaluator
16:31 to 17:00	twenty (20) points per evaluator

ATTIRE

TSA competition attire is required. Note additional specific attire requirements for Chapter Team found in the General Rules and Regulations and on the [TSA website](#).

PROCEDURE

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRELIMINARY ROUND

- A. Participants report for the test at the time and place stated in the conference program.
- B. A parliamentary procedures test is administered at the same time to all team members.
- C. Twelve (12) teams with the highest averaged scores are selected as semifinalists for the oral presentation. A semifinalist list in random order is posted.

SEMIFINAL ROUND

- A. A semifinalist team representative reports at the time and place stated in the conference program to sign up for an oral presentation time.
- B. Semifinalist teams report at the assigned time and place for the oral presentation.
- C. Each team follows the procedure for opening and closing a local chapter meeting:
 - 1. A list of three (3) parliamentary actions are provided by the event coordinator and given to each team for the oral demonstration.

2. Each team then closes the meeting according to the prescribed procedure.
3. Concerning the reading of the TSA Creed by the secretary during the closing ceremony, a chapter has the option to recite the creed using one (1) or more of its team's members.
4. The secretary has five (5) additional minutes to complete the minutes of the meeting.
5. Ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

PRELIMINARY ROUND

- A. Participants are responsible for bringing two (2) sharpened No.2 pencils to the test site.
- B. The test may be administered online or via a scan-type answer sheet.
- C. Team members take the test individually.
 1. These same six (6) team members compete in the semifinal round of the event, should the team qualify.
 2. Teams consist of a president, vice president, secretary, treasurer, reporter, and sergeant-at-arms.
 3. Written materials, other than those provided by National TSA, may not be taken in the event room.

SEMIFINAL ROUND

- A. Teams respond to the semifinalist challenge by demonstrating a call to order, pledge to the flag, roll call, order of business, and closing ceremony.
- B. Any team that fails to appear at the designated time is placed at the end of the list and allowed to participate at the discretion of the evaluators and event coordinator if time permits.
- C. Materials provided to teams:
 1. A set consisting of secretary's minutes, copy of Chapter Team Official Minutes form for secretary's minutes, a treasurer's report, a copy of the TSA creed, and a list of parliamentary actions
 2. Paper, six (6) pens, a calculator, and six (6) 3" x 5" note cards

- D. Optional materials: A timepiece and/or a non-programmable calculator may be used by a team.
- E. Room set-up:
 1. Officer symbols and gavel (only) are placed on a long table with the United States flag positioned to the right of the president's rostrum (if available) and the host state flag to the left.
 2. The president's rostrum (if available) should be centered between the two (2) flags.
 3. The symbols of the officers should be placed in front of the respective officers.
 4. The host state banners are optional and do not add to or subtract from a team's score.
- F. The semifinal portion of the event includes:
 1. The call to order
 2. The pledge to the flag
 3. Roll call
 4. Order of business
 5. Closing ceremony
- G. Semifinal time limits and rules:
 1. Teams have a time limit of fifteen (15) minutes to complete required parliamentary actions, items of business, set-up time, and a presentation.
 2. Official timing begins when the materials are given to the president and stops at the team's final gavel to end the meeting.
 3. Five (5) points will be deducted for every thirty (30)-second interval over the allotted time (see TIME LIMITS).
 4. Bonus points will be awarded for additional motions and parliamentary actions by the officers, other than the president.
 5. At the conclusion of the oral presentation, each team secretary has five (5) minutes to write a copy of chapter minutes that is submitted to an evaluator. The coordinator begins timing the five (5) minutes when the secretary is seated at the area designated for writing of the minutes.

6. All materials given to team members, and the chapter minutes recorded during the presentation, must be handed to the evaluators before the team leaves the room.
7. No reference should be made to a team's school, chapter name, city, or state. Exception: The state name on a TSA patch is acceptable.

EVALUATION

PRELIMINARY ROUND

- A. Scores on a test of fifty (50) questions determine the semifinalist teams for the oral presentation.
 1. Each team's average test score is used to determine the twelve (12) semifinalist teams.
 2. A team's average test score is included in the final results.

SEMIFINAL ROUND

- A. The demonstration of a chapter business meeting
Refer to the official rating form for more information.

NOTES

There are a number of ways to learn about parliamentary procedure. The standard reference is *Robert's Rules of Order, Newly Revised*. Information about parliamentary procedure websites may be found online at: www.rulesonline.com/parliamentary_procedure_websites.htm

For writing proper minutes, also refer to *Robert's Rules of Order, Newly Revised*.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the career areas featured in the TSA AND CAREERS section of this guide. Careers will vary based on the student's area of interest.

CHAPTER OPENING AND CLOSING CEREMONIES

OPENING CEREMONY

- A. At the prescribed time for meetings, the president assumes his/her position behind the rostrum in the front center of the room.
- B. Other officers are seated to the left and right of the president. They are seated in this order from stage left to right: vice president, treasurer, secretary, president, reporter, and sergeant-at-arms.

HOST STATE BANNER (OPTIONAL)

U.S. FLAG SGT.-AT-ARMS REPORTER PRESIDENT SECRETARY TREASURER VICE PRES. STATE FLAG

(OFFICERS FACING AUDIENCE)

AUDIENCE

- President: (raps gavel twice) The meeting will please come to order. Mr./Ms. Sergeant-at-Arms, are all the officers in their places?
- Sergeant-at-Arms: They are, Mr./Ms. President.
- President: (raps three [3] times for assembly to rise) Mr./Ms. Sergeant-at-Arms, please lead the assembly in the Pledge to the Flag of the United States of America.
- Sergeant-at-Arms: (leads Pledge to the Flag)
- President: (raps once and assembly is seated) Mr./Ms. Secretary, will you please call the roll.
- Secretary: Mr./Ms. Sergeant-at-Arms.
- Sergeant-at-Arms: Present. The symbol of my office is the “hearty handshake” (officer points to symbol), and it is my responsibility to see that the assembly is comfortable and properly welcomed. It is also my duty to serve as doorkeeper for this organization.
- Secretary: Mr./Ms. Reporter.
- Reporter: Present. The symbol of my office is the beacon tower (officer points to symbol), and it is my duty to see that our school, community, and national association have a complete report of our organization’s activities.
- Secretary: Mr./Ms. President.
- President: Present. The symbol of my office is the gavel (officer points to symbol). The duties vested in me by my office are to preside at all regular and special meetings of this organization and to promote cooperation in carrying out the activities and work of our organization. Mr./Ms. Secretary.
- Secretary: Present. The symbol of my office is the pen (officer points to symbol), and it is my responsibility to see that accurate and proper records are kept of all business and correspondence of this association. Mr./Ms. Treasurer.

- Treasurer: Present. The symbol of my office is a balanced budget (officer points to symbol), and it is the duty of my office to keep accurate records of all funds and see that our financial obligations are met promptly.
- Secretary: Mr./Ms. Vice-President.
- Vice President: Present. The symbol of my office is a star (officer points to symbol), and it is the duty of my office to see that we always have a strong membership, a good work program, and are alert to the welfare of our chapter.
- Secretary: Mr./Ms. President, all officers are present and in their place.
- President: Mr./Ms. Sergeant-at-Arms, do we have guests present?
- Sergeant-at-Arms: If so, introduce guest(s); if not, state the following: No, Mr./Ms. President.
- President: Mr./Ms. Secretary, we are ready to transact our business.
- Teams dispose of the assigned business following the suggested order of business.

CLOSING CEREMONY

- President: (raps three [3] times; assembly rises) Mr./Ms. Secretary, will you please (read) or (lead us in) the TSA Creed.
- Secretary: (recites the TSA Creed; when presented at state and national competitions, the creed may be presented in some more original method.)
- President: Will the assembly repeat the TSA Motto after me. (Motto is spoken.) Does anyone know of any reason why this assembly should not adjourn? If not, I will entertain a motion to adjourn. (following motion to adjourn, a second, and a vote) I now declare this meeting adjourned until a special meeting is called or until our next regular meeting (raps once with gavel).

SUGGESTED ORDER OF BUSINESS FOR CHAPTER MEETINGS

1. The president calls the meeting to order with opening ceremonies.
2. Roll call is taken and a quorum is established.
3. The secretary reads the minutes of the preceding meeting. Any necessary corrections and/or additions are made and the minutes are approved as read or corrected.
4. The treasurer's report is received as read and placed on file, subject to audit.
5. The chairperson calls for committee and officer reports as necessary. If a committee has no report, let the committee so state.
6. Unfinished business is addressed.
7. New business is addressed.
8. The program, if any, is held. The chairperson presides with the assistance of the program chairperson or the committee chairperson.
9. Make announcements.
10. Adjournment with closing ceremonies.

CHAPTER TEAM OFFICIAL MINUTES

Team ID number _____

Date _____

Location of conference _____

Participants may use the back of this page, if necessary.

Secretary's signature _____ Date _____

CHAPTER TEAM

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

☐ ENTRY NOT EVALUATED

TEAM TEST (10 points)						Record scores in the column spaces below.
Record the scores of the six (6) team members in the boxes below. Calculate the average of their scores. Divide the average by five (5) for the score that the team will receive out of ten (10) points. Record the score in the column space to the right.						
#1	#2	#3	#4	#5	#6	
TEAM TEST SUBTOTAL (10 points)						
Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right. Indicate the rule violated: _____						
PRELIMINARY SUBTOTAL (10 points)						

BUSINESS MEETING DEMONSTRATION (190 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points	
PREPARATION FOR MEETING (30 points)				
Official Attire/Poise (X2)	Appearance is untidy; grooming is lacking; clothing is not consistent in coloration and visual appearance; shoes are the wrong color; poise and confidence are missing.	Overall appearance is neat and consistent; grooming is decent and professional appearance is adequate.	Overall appearance is cohesive, polished, and business professional.	
Placement of Flags and Officer Symbols; Officer Seating (X1)	Flags are not placed in the correct order; and/or officer symbols are not in the correct order; and/or are not aligned properly on the table; and/or not all officers are seated in the proper arrangement, resulting in a sloppy and haphazard appearance.	Placements and seating are generally businesslike and professional, with some inconsistencies (e.g., flags are in the correct order but are not aligned with other aspects of the officer gear; and/or several of the symbols are in proper order but are some are misaligned; and/or officers are seated in the proper arrangement, but some chairs are misaligned, etc.).	Flags are completely aligned and in proper order and placement; officer gear is placed in the correct order and in proper alignment on the table; the seating arrangement is precise, businesslike, and professional.	

BUSINESS MEETING DEMONSTRATION (190 points) – continued				
KNOWLEDGE OF TSA (20 points)				
Opening Ceremony (X1)	Many items of sequence and order are incorrect; officers make several mistakes.	Officers make few, if any, sequence and order mistakes, resulting in a fairly smooth opening ceremony.	The opening is smooth and efficient.	
Closing Ceremony (X1)	Officers make several mistakes; the creed recitation is sloppy and the overall effort is unpolished.	Appropriate procedures are followed, with some mistakes made (e.g., creed recitation).	The closing is outstanding, with no mistakes; the presentation is highly polished.	
KNOWLEDGE OF PARLIAMENTARY PROCEDURE (140 points)				
Voting Procedures (X1)	Several significant mistakes are made in voting procedures.	Only a few mistakes are made in voting procedures.	All voting procedures are correct, smooth, and efficient.	
Debate (exclude president) (X3)	Only a few officers participate effectively in the debate, which is loosely presented.	Most officers participate in the debate process and are somewhat convincing.	All officers participate in and present a highly cohesive debate.	
Parliamentary Actions (X5)	Only one (1) of the required actions is completed correctly.	At least two (2) of the actions are completed correctly, with adequate effort.	All three (3) actions are completed correctly, with notable and inspiring effort.	
Communication (X2)	Communication is unclear; some mumbling occurs and/or voices are too loud or too soft; and/or problems occur with verbal expression (e.g., grammar, sentence structure); leadership and 21 st century skills are not evident.	Communication is generally clear, with appropriate volume of voices and only minor problems with articulation or verbal expression; leadership and 21 st century skills are somewhat evident.	Communication is clear, concise, and easy to understand; voices are well modulated and speakers are articulate; leadership and 21 st century skills are somewhat evident.	
Treasurer's Report (X1)	The report is incorrect or not complete; math and spelling errors are evident.	The report generally is correct and complete, with only one (1) or two (2) math or spelling errors.	The report is correct and complete, with no math or spelling errors.	
Chapter Minutes (X2)	The format of the minutes is incorrect or not complete; poor grammar and spelling errors are evident.	The format of the minutes is generally correct and complete, with few grammar and/or spelling errors.	The minutes are formatted correctly, are complete, and have no grammar or spelling errors.	
BUSINESS MEETING DEMONSTRATION SUBTOTAL (190 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
SEMIFINAL SUBTOTAL (200 points)				
TIME DEDUCTIONS (NO TEAM MAY GO BEYOND 17 MINUTES)				
<p>A five-(5) point deduction will be incurred for every thirty (30)-second interval over the allotted time. Multiply the number of intervals by five (5) and record the total deduction in the column to the right.</p> <p># of intervals X 5 = _____ (total deduction)</p>				

To arrive at the **TOTAL** score, add any subtotals and subtract rules violation points, as necessary.

TOTAL (200 points)

BONUS (20 points)

**For Additional
Motions and
Parliamentary
Actions**

(by officers other
than the president)
(X2)

Only one (1) or two (2) of the
additional actions is/are completed
correctly; the effort is uninspiring.

Three (3) or four (4) of the actions
are completed correctly.

All five (5) of the supplementary
actions are completed correctly in
an efficient and effective manner.

BONUS SUBTOTAL (20 points)

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

CHAPTER TEAM EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges, two (2) or more
- C. Assistants, two (2) or more for the test and two (2) or more for the oral presentations
- D. Timekeeper

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Copies of parliamentary procedures test
 - 5. Opening and closing ceremonies script
 - 6. List of parliamentary actions; one (1) copy for each semifinalist team and copies for the judges.
 - 7. Copies of secretary's minutes
 - 8. Copies of treasurer's report
 - 9. Copies of the Chapter Team Official Minutes document
 - 10. Paper, pens, one (1) calculator, and six (6) 3" x 5" note cards, per team
 - 11. Results envelope with coordinator forms
- B. Coordinators are responsible for creating the test to be administered at the national conference; copies will be provided by the national TSA office.
- C. Officer's symbols and gavel
- D. United States flag
- E. State flag (optional)
- F. Stopwatches
- G. Table rostrum, if available
- H. One (1) long table or two (2) tables and six (6) chairs for team members
- I. One (1) table and three (3) chairs for judges

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area or room in which the event is to be held for appropriate set-up, including room size, chairs, tables, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is scheduled to begin, meet with judges/assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRELIMINARY ROUND

- A. Begin the event at the scheduled time by closing the doors and checking the entry list.
- B. All participants and evaluators should be in the room at this time.
- C. Late participants and/or entries are considered on a case-by-case basis and only when lateness is caused by events beyond the participant's control.
- D. In order to compete, participants must be on the entry list or must have approval of the CRC.
- E. Administer the test.
- F. Determine individual and team scores.
- G. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry

The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- H. Submit semifinalist results to the CRC for posting.

SEMIFINAL ROUND

- A. Check in semifinalists at the time stated in the conference program. Inform the teams of their order of performance and review the procedure to be followed.
- B. When a team enters the oral performance room, the materials (secretary's minutes, copy of Chapter Team Official Minutes form for secretary's minutes, a treasurer's report, a copy of the TSA creed, and a list of parliamentary actions) are provided to the president. At this point, begin the allotted time.
- C. The event coordinator or an assistant is responsible for introducing each team by entry number only when the previous team has finished its presentation.
- D. Teams may take chapter paraphernalia (officer symbols and gavel only) into the performance room if desired, or they may use what is provided by the event coordinator.
- E. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- F. Judges determine the ten (10) finalists and discuss and break any ties.
- G. Submit the finalist results and all related forms in the results envelope to the CRC room.
- H. If necessary, manage security and the removal of materials from the area.

OVERVIEW

Applying leadership and 21st century skills, participants create an illustrated children's story of high artistic, instructional, and social value. The narrative may be written in prose or poetry and take the form of a fable, adventure story, or other structure. The physical story book should be of high quality and designed to meet the annual theme, which will be posted on the [TSA website](#) under Competitions/Themes and Problems.

ELIGIBILITY

Three (3) teams per state may participate; individual entries are permitted.

TIME LIMITS

SEMIFINAL ROUND

- A. Twelve (12) minutes are allowed for the semifinal reading.
- B. An additional five (5) minutes are allowed to answer questions.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants access the annual design challenge on the [TSA website](#) under Competitions/Themes and Problems.
- B. Participants concentrate their efforts in researching, writing, and illustrating children's books and literature, as well as the creation of storybooks similar to the annual design challenge (e.g., pop-ups, interactive books, etc.).
- C. Participants develop and construct a high-quality children's storybook with illustrations.
- D. Participants record the design process in a documentation portfolio.
- E. Participants "field test" their storybook and document outcomes and findings.

PRELIMINARY ROUND

- A. No more than two (2) team representatives report to the time and place stated in the conference program to check in:
 - 1. The storybook
 - 2. The documentation portfolio
- B. Entries are reviewed by judges with neither students nor advisors present.
 - 1. Judges score the Storybook criteria to determine the top twenty-four (24) preliminary contestants, which will not be posted.
 - 2. Judges score the Documentation criteria of those top twenty-four contestants to determine the top twelve (12) semifinalist teams.
- C. A list of twelve (12) semifinalist teams (in random order) is posted.

SEMIFINAL ROUND

- A. Participants report to the event area at the time and place stated in the conference program to sign up for a reading and interview time.
- B. No more than two (2) representatives report at the assigned time and place for the reading and interview.
 - 1. One representative is the team's reader, who reads the story to the judges.
 - 2. Both representatives participate in the interview process following the reading of the story. The interview process lasts up to five (5) minutes.
- C. Judges score the Reading and Interview criteria.
- D. No more than two (2) team representatives pick up the team's entry from the display area at the time and place stated in the conference program.
- E. Ten (10) finalists are announced during the conference award ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRE-CONFERENCE

A. Storybook:

1. Participants design and create an entirely original storybook, complete with narrative and illustrations to meet the annual design challenge.
2. The physical storybook should be of high quality, designed to meet the age group for which it is intended. For the purposes of this event, children are defined as those twelve (12) years or younger.
3. Together with the storybook, the narrative and accompanying illustrations should result in an experience that delights, enlightens, and contributes to the wholesome development of a child.
4. The storybook and narrative with accompanying illustrations should take between five (5) and ten (10) minutes to read and view.
5. The physical storybook must not exceed 12" x 12" when closed.
6. There is no limit on the number of inside pages (may be one or two-sided).
7. The team must determine which format best presents the team's narrative and illustrations.
8. There must be a minimum of seven (7) illustrations that enhance the story and deepen the child's understanding and enjoyment of the reading experience.
 - a. An illustration on the book's cover may count as one (1) of the required seven (7) illustrations. The team may use the cover illustration within the story as well
 - b. All illustrations MUST be original, freehand, and/or computer-generated drawings made by the team member(s).
 - c. All computer-generated work MUST be developed from primitive lines and shapes and be the sole work of the team members(s).
 - d. Physical or computer templates, previously existing drawings, characters, backgrounds, etc., are NOT PERMITTED. The storybook may include the name of the author(s) and illustrator(s) on the cover.
9. Copyrighted material is NOT PERMITTED.
10. The physical storybook must be the original work of the team members.
11. If narrative or illustrations appear in the story and they are not authored by one of the team members, the team will be disqualified.
12. The book must be designed, engineered, created, and bound together solely by the team; no professional binding is allowed.
13. Photographic verification of the book construction process must be included in the portfolio.
14. The story must be no more than fifteen hundred (1500) words.
 - a. There will be a five (5)-point deduction for every hundred (100) words over the fifteen hundred (1500) word limit.
 - b. Stories containing two thousand (2000) or more words will be disqualified.
 - c. There is no minimum number of words required.
15. Publishing rights remain with the authors and illustrators.

B. Documentation Portfolio:

1. Documentation materials (comprising "a portfolio") are required and must be secured in a [clear front report cover](#) with the following single-sided, 8½" x 11" pages, in this order:
 - a. Title page with the title of the story, the event title, the conference city and state, the year, and the team/individual chapter ID number; one (1) page
 - b. Table of contents; pages as needed

- c. Purpose of story; one (1) page, to include:
 - i. Story's intent
 - ii. Summary of storyline and theme
 - iii. Intended audience (age, gender, demographics, and special disabilities, if any)
 - iv. Word count – Number of words comprising the story's narrative
- d. Photographic verification of book construction and binding (pages as needed)
- e. A Plan of Work log (see Forms Appendix); pages as needed
 - i. The Plan of Work log must include a summary of the storybook's assessment during a "field test" with a group of children within the age group specified in the annual problem. A "field test" is a reading of the storybook to a group of children in the intended target age range.
 - ii. Participants must document each field test and record outcomes and findings; pages as needed.
 - iii. A minimum of two (2) "field tests" must be conducted.
 - iv. Each "field test" must be signed off by the chapter advisor.
- f. Research summary: A written summary of the research, writing strategies, problems encountered, and solutions developed in the writing and illustrating of the story; one (1) page.
- g. Project summary: A written summary of the research into the creation of storybooks similar to the annual design challenge (e.g. paper folding, interactive features in books). The summary must include the process and challenges the team encountered and the solutions developed in overcoming them; one (1) page.
- h. A list of tools, software (if any), and techniques used in the creation of the physical storybook and illustrations, not to exceed one (1) page.
- i. References/research sources; one (1) page.

PRELIMINARY ROUND

- A. No more than two (2) team representatives drop off the storybook and documentation portfolio at the time and place stated in the conference program. **NOTE: The documentation portfolio and storybook must be submitted together, in order for the entry to be judged.**

EVALUATION

PRELIMINARY ROUND

- A. The physical storybook
- B. The documentation portfolio

SEMIFINAL ROUND

- A. The reading
- B. The interview

Refer to the official rating form for more information.

STEM INTEGRATION

Depending upon the subject of the story this event may align with one (1) or more of the STEM (Science, Technology, Engineering, and Mathematics) educational standards. Refer to the STEM Integration section of this guide for more information.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Writer
- Illustrator
- Educator
- Editor
- Publisher
- Graphic artist

CHILDREN'S STORIES

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

-
- ☐ Documentation portfolio is present
 - ☐ Storybook is present
 - ☐ The story is 1999 words or less (verified in portfolio)
 - ☐ ENTRY NOT EVALUATED

STORYBOOK (130 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points	
Story Narrative (X3)	Narrative is poorly written; there is little apparent purpose; it is lacking a coherent theme and storyline.	Narrative's purpose is clear, with a focused theme and storyline; the narrative has good pacing and development of characters and events.	Narrative is extremely well written with a clear purpose; storyline is fast paced and exciting; the details are rich and enchanting.	
Illustrations (X3)	Artisanship of the illustrations reflects little technical skill; illustrations add little value to the story's narrative, storyline, and/or theme.	Artisanship of most illustrations reflects good technical skill; illustrations add to the story's narrative, storyline, and theme.	Artisanship of illustrations is excellent, reflecting sophisticated technical skills; illustrations enhance the story's narrative, storyline, and theme, and they are of high esthetic quality.	
Book Construction and Concept (X3)	Book construction demonstrates little or no creativity or innovation; minimal consideration is given to basic design principles and book construction; book is poorly constructed or is not bound.	Construction of the book is of good quality and demonstrates some degree of creativity and innovation and an understanding of basic design principles; adequate choice of materials was used in its construction.	Book is designed with attention to detail; construction is of high quality and demonstrates a thorough understanding of design principles; an excellent choice of materials was used in the construction of the book.	
Impact (X3)	Story (narrative, with the illustrations) is lacking in purpose and coherence; it is not very interesting; it lacks artistic, and/or instructional, and/or social value.	Story (narrative, with the illustrations) reflects a purpose and incorporates artistic, instructional, and social value; it is somewhat compelling and entertaining.	Story (narrative, with the illustrations) is beautifully told; it is compelling, entertaining, purposeful, and it reflects high artistic, instructional, and social value.	
Theme (X1)	The annual theme is not addressed.	The annual theme is somewhat addressed but doesn't contribute to the effectiveness of the overall design.	The annual theme is addressed and contributes to the effectiveness of the overall design.	
STORYBOOK SUBTOTAL (130 points)				

DOCUMENTATION PORTFOLIO (80 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Portfolio Components (X1)	Portfolio is unorganized and/or is missing three (3) or more components.	Portfolio is missing one (1) or two (2) components and/or is loosely organized.	Portfolio has all required components and is well organized.	
Photographic Verification (X1)	Photographic verification is very unorganized or is missing.	Photographic verification is somewhat disorganized and is missing a few components; the process is somewhat outlined.	Photographic verification has all components and is well organized; the process is clearly outlined.	
Purpose of Story (X1)	Story's intent, storyline, and theme are poorly explained and/or the intended audience is not identified.	Story's intent, storyline, theme, and intended audience are adequately explained.	Story's intent, storyline, theme, and intended audience are complete and well explained.	
Plan of Work Log (X1)	Log is poorly organized and/or incomplete.	Log is adequately detailed and organized and contains most of the required components, including a record of the periodic readings to children.	Log is well documented and contains all the required components, with special attention given to periodic readings to children.	
Professional and Technical Information (X2)	Summary of the research, design, and writing process is poorly done and/or is incomplete.	Summary of the research, design, and writing process is generally clear and complete.	Summary of the research, design, and writing process is very well written, detailed, clear, and complete.	
Research Base (X2)	There are few references listed, and/or the references listed show little relevance to the project's goal; sources lack credibility.	There are a sufficient number of references listed, with some credible references.	Many credible and high quality references are listed, reflecting research in writing and illustrating for children, and in child development.	
DOCUMENTATION SUBTOTAL (80 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initiated by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
<p>Story length violation: For stories exceeding 1500 words, a deduction of 5 points will be incurred for every 100 words more than 1500 and up to 2000. Stories of 2000 words or greater will be disqualified. Example: 1600 – 1699 words, 5 points; 1700 – 1799 words, 10 points; 1800 – 1899 words, 15 points; 1900 – 1999 words, 20 points; 2000 words and above, disqualified.</p>				
PRELIMINARY SUBTOTAL (210 points)				

SEMIFINAL READING AND INTERVIEW (30 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Story's Reading (X1)	Story's reading is lackluster; reader shows little enthusiasm; delivery is halting and difficult to understand; story is read too quickly to permit viewing of the illustrations.	Story's reading is generally good; reader's speech is clear and mostly well-paced and enthusiastic; sufficient time is given for reflection on the illustrations.	The story's reading is exemplary; the reading is clear, well paced, and enthusiastic; sufficient time is given to reflect upon and appreciate the illustrations.	
Knowledge (X1)	Participants seem to have little understanding of the concepts in their project; answers to questions may be vague.	Participants exhibit a general understanding of the concepts in their project.	Participant shows clear evidence of a thorough understanding of their project.	
Articulation (X1)	Communication of the design process is unclear, unorganized, and/or illogical; leadership and/or 21 st century skills are not evident.	Communication of the design process is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the design process is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
SEMIFINAL READING AND INTERVIEW SUBTOTAL (30 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
SEMIFINAL SUBTOTAL (30 points)				
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.</p>				
TOTAL (240 points)				

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

CHILDREN'S STORIES

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more
- C. Assistants for check-in, two (2)

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stick-on labels for identifying entries
 - 5. Results envelope with coordinator forms
- B. Stopwatch
- C. Display tables for entries (minimum width 18")
- D. Table and chairs for judges and two (2) semifinalist team representatives.

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, tables, chairs, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is scheduled to begin, meet with the judges to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

EVENT CHECK-IN

- A. Check in the entries at the time stated in the conference program.
- B. Participants check in:
 - 1. The storybook
 - 2. The documentation portfolio
- C. Each entry must include the participant's identification number in the upper right-hand corner of the entry.
- D. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.
- E. In order to compete, participants must be on the entry list or must have approval of the CRC.
- F. Requirements for attire do NOT apply during check-in, only on the first day of the conference.
- G. Position the entries for evaluation and viewing.
- H. Secure the entries in the designated area.

PRELIMINARY ROUND

- A. Judges independently assess the entries.
- B. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry

The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- C. Submit the semifinalist results and all related items/forms in the results envelope to the CRC room for posting.
- D. Create a semifinalist sign-up sheet for each team's final presentation.

SEMIFINAL ROUND

- A. Two (2) team representatives report to the event area at the time and place stated in the conference program to sign up for a reading and interview time.
- B. Two (2) team representatives report at the assigned time and place for the seminal reading and interview.
- C. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- D. Manage the readings and interviews:
 - 1. The team's reader is given up to twelve (12) minutes to read the story to the judges.
 - 2. The other team member must be prepared to discuss illustrations included in the story.
 - 3. Both team members participate in the interview process (lasting up to five [5] minutes) following the reading of the story.
- E. Judges score the Reading and Interview criteria.
- F. Judges determine the ten (10) finalists and discuss and break any ties.
- G. Submit the finalist results and all related forms in the results envelope to the CRC room.
- H. If necessary, manage security and the removal of materials from the event area.

OVERVIEW

Participants demonstrate their knowledge of computer science and coding by taking a test. Applying leadership and 21st century skills, semifinalists participate in an on-site programming challenge. Specific requirements, such as the programming language, are posted on the [TSA website](#) under Competitions/Themes and Problems. Completed solutions are objectively measured to determine the best and most effective solution for the stated problem.

ELIGIBILITY

One (1) team of two (2) individuals per chapter may participate.

TIME LIMITS

PRELIMINARY ROUND

- A. One (1) hour is allowed for the test, which all participants take simultaneously.

SEMIFINAL ROUND

- A. Two (2) hours are allowed for the on-site challenge.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRELIMINARY ROUND

- A. Participants report at the time and place stated in the conference program for the exam.
- B. Both team members take the test simultaneously.
- C. A list of twelve (12) semifinalist teams (in random order) is posted.

SEMIFINAL ROUND

- A. Participants bring their own computer systems to the event area at the time and place stated in the conference program.
- B. Participants are given a problem, evaluation criteria, materials, and allotted two (2) hours for the design and construction of the solution.

- C. Each solution is tested and presented to the judges as soon as possible after the coding phase is completed.
- D. Ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRELIMINARY ROUND

- A. Tests may be administered online or via a scan-type answer sheet. Please review the Competition Updates page on the [TSA website](#).
- B. Participants are responsible for bringing two (2) sharpened No.2 pencils to the test site.

SEMIFINAL ROUND

- A. Participants respond to a design challenge consisting of a series of coding problems that must be completed on-site at the conference within a two (2)-hour time frame.
- B. All work must be completed in the event area during the time specified for the event.
- C. Teams must bring the following:
 - 1. One (1) laptop
 - 2. Extra charged laptop battery or extra charged laptop as backup (but only one laptop may be used at any time)
 - 3. One (1) computer mouse
 - 4. Pencils and paper
- D. Participants do NOT have access to electrical power/outlets during the event.
- E. Participants do NOT have access to the Internet during the event. The use of hot spots is not permitted.

- F. Participants must have all software development tools needed for the competition downloaded and accessible on their computers.
- G. All solutions must be tested, demonstrated and presented by participants in front of the judges.

EVALUATION

PRELIMINARY ROUND

- A. Each team's averaged test score

SEMIFINAL ROUND

- A. The solution to the on-site problem
 - 1. Each problem in the programming challenge will have an objective correct answer.
 - 2. Second-best attempts or other objective criteria will be used to break ties when necessary.
 - 3. Only as a last resort will subjective criteria, such as originality, be used to evaluate solutions.

STEM INTEGRATION

Depending upon the subject of the problem, this event may align with one (1) or more of the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Computer software engineer
- Mathematician

CODING

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

☐ Computer hardware is present

☐ ENTRY NOT EVALUATED

TEST (50 points)

TEST SUBTOTAL (50 points)

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

PRELIMINARY SUBTOTAL (50 points)

ON-SITE PROBLEM – SUBJECTIVE (20 points)

CRITERIA	Minimal performance	Adequate performance	Exemplary performance
	1-4 points	5-8 points	9-10 points
Subjective Criteria (X2)	Team did not work well together, did not understand the solution, and did not demonstrate an understanding of coding practices; leadership and/or 21 st century skills are not evident.	Team worked reasonably well together; team demonstrates an adequate understanding of the problem solutions and of coding practices; leadership and/or 21 st century skills are somewhat evident.	Team works well together and demonstrates superior understanding of the solution and of coding practices; leadership and/or 21 st century skills are clearly evident.
ON-SITE PROBLEM (SUBJECTIVE) SUBTOTAL (20 points)			

Record scores in the column spaces below.

ON-SITE PROBLEM – OBJECTIVE (80 points)

Evaluation: A finite unit of measure, such as elapsed time, linear distance, and/or strength, etc., is used to determine ranking.

1st: 80 Points**2nd:** 75 Points**3rd:** 70 Points**4th:** 65 Points**5th:** 60 Points**6th:** 55 Points**7th:** 50 Points**8th:** 45 Points**9th:** 40 Points**10th:** 35 Points**ON-SITE PROBLEM (OBJECTIVE) SUBTOTAL (80 points)**

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

SEMIFINAL SUBTOTAL (100 points)

To arrive at the **TOTAL** score, add any subtotals and subtract rules violation points, as necessary.

TOTAL (150 points)

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

CODING

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges, two (2) or more
- C. Assistants, two (2) or more

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Results envelope with coordinator forms
- B. Tables and chairs for participants
- C. Tables and chairs for judges
- D. Coordinators are responsible for creating the test to be administered at the national conference; hard copies will be provided by the national TSA office, if applicable.
- E. Answer sheets (scan-type) and paper
- F. Extra sharpened No.2 pencils
- G. Twelve (12) copies of a well-written, technologically appropriate problem for each semifinalist team that can be objectively measured; one (1) copy per team
- H. Adequate conditions, tools, materials, monitoring, and testing devices for the problem
- I. Stopwatch or clock for timekeeper

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.

- D. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, chairs, tables, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is to begin, meet with judges to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRELIMINARY ROUND

- A. Prior to the conference, the event coordinator shall become familiar with the format of the exam (refer to the Competition Updates page of the [TSA website](#)).
- B. Begin the event at the scheduled time by closing the doors and checking the entry list.
- C. All participants and judges should be in the room at this time.
- D. Late participants and/or entries are considered on a case-by-case basis and only when lateness is caused by events beyond the participant's control.
- E. In order to compete, participants must be on the entry list or must have approval of the CRC.
- F. Distribute any necessary materials.
- G. Monitor the one (1)-hour test.
- H. Score the exams.
- I. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry
 The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- J. Judges determine the twelve (12) semifinalists and discuss and break any ties.
- K. Submit semifinalist results and all related forms in the results envelope to the CRC room.

SEMIFINAL ROUND

- A. At least one (1) hour before the event is scheduled to begin, meet with semifinalist judges to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.
- B. Check in the semifinalist teams and equipment. Teams must bring:
 - 1. One (1) laptop
 - 2. Extra charged laptop battery or extra charged laptop as backup (but only one laptop may be used at any time)
 - 3. One (1) computer mouse
 - 4. Teams may also bring pencils and paper.
- C. Participants do NOT have access to electrical power/ outlets during the event.
- D. Participants do NOT have access to the Internet during the event.
- E. Participants must have all software development tools needed for the competition downloaded and accessible on their computers.
- F. Once teams are seated and general announcements have been given, distribute and review the problem and start the time.
- G. All solutions must be tested, demonstrated and presented by participants in front of the judges. Judges and assistants observe, with judges evaluating solutions as soon as appropriate.
- H. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- I. Judges determine the ten (10) finalists and discuss and break any ties.
- J. Submit the finalist results and all related forms in the results envelope to the CRC room.
- K. Manage security and the removal of materials from the area.

COMMUNITY SERVICE VIDEO



OVERVIEW

Applying leadership and 21st century skills, participants create and submit a video that depicts their local TSA chapter's involvement with a community service project (e.g. American Cancer Society) of their choice.

ELIGIBILITY

One (1) team per chapter may participate; individual entries are permitted.

TIME LIMITS

- A. All components of the chapter's entry must be finished, submitted, and accessible via the Internet by 11:59 p.m. ET on May 15th.
- B. Email verification of each team's entry will be made by June 10th.
- C. The video cannot exceed a duration of more than two and one-half (2½) minutes.
- D. A deduction of five (5) points will be applied to videos exceeding the time limit.
- E. There is no minimum length restriction.
- F. The video is timed from the first sound or picture to the final sound or picture.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants identify a community service project.
- B. Participants prepare a video while observing the requirements.
- C. Participants submit a community service video by 11:59 p.m. ET on May 15th.
- D. Submission information will be provided on the [TSA website](#) under Competition Updates.

PRELIMINARY ROUND

- A. A list of twelve (12) semifinalist teams (in random order) is posted on-site on the first full day of conference.

SEMIFINAL ROUND

- A. Participants report at the time and place stated in the conference program to sign up for an interview time.
- B. Participants report at the assigned time and place for the interview.
- C. Participants answer questions about their entry, the video's purpose, value, design, and the development process.
- D. Ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRE-CONFERENCE

- A. Participants may choose any video hosting site (such as an UNLISTED YouTube URL), or a shareable link in cloud storage, as long as the video is located online and accessible for evaluation.
- B. If a URL is provided, the URL must point directly to the participant's entry. Entries that require a software download or request that access be granted will not be judged.
- C. Entries received, or changes made to submitted entries after the deadline will not be judged.
- D. The year must be clearly illustrated at the beginning of the video.
- E. The video entry must be submitted in a common video format suitable for viewing with VLC Player, utilizing a Microsoft Windows operating system.
- F. This entry is exempt from the General Rule which states that a chapter name must not appear in an entry.

- G. All video footage, graphics, special effects, and audio clips must be originally created/filmed by the participants.
- H. No commercial or copyrighted material may be used, regardless of copyright fair use policy.
- I. Supporting Documentation:
 - 1. Participants must complete the Student Copyright Checklist (see Forms Appendix) and save it as a PDF to be submitted electronically with the entry online. The submission form will have a separate link for documentation.
 - 2. If the entry contains images of people, proof of consent must be provided for each person in the video.
 - a. Minors require parental consent.
 - b. Use the Photo/Film/Video Consent and Release form (see Forms Appendix) for any individuals included in the video footage.
 - c. Participants must scan each completed consent form and save it as a single, multi-page PDF file to be submitted pre-conference.

EVALUATION

PRELIMINARY ROUND

- A. The video

SEMIFINAL ROUND

- A. The interview

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Videographer
- Director
- Actor
- Screenplay writer
- Audiovisual technician

COMMUNITY SERVICE VIDEO

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

☐ Video entry was submitted and scored

☐ ENTRY NOT EVALUATED

VIDEO PRODUCTION (50 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Planning (X1)	Video shows little or no evidence of planning, analysis, or research.	Video shows good analysis of the project; concepts make sense.	Video shows a complete and insightful analysis; content is outlined properly.	
Camera (X1)	Problems are evident with camera focus, steadiness, and framing.	Camera work is clearly focused and framed; creative and close-up shots are somewhat used.	Steady and creative shots that enhance the video are evident in the camera work; there is good use of close-ups.	
Lighting (X1)	Poor ambient lighting choices and/or heavy back-lighting are evident.	Adequate lighting on subjects and proper lighting techniques are evident.	Excellent and creative use of lighting to propel the story emotionally is evident.	
Continuity and Pacing (X2)	Show sequencing in the video is incomprehensible; shots are left too long; edit points have glitches.	Pace and timing of the video are well structured; clips move along, telling the story; moderate use of transitions is evident.	Shots logically pace the story in an interesting way; excellent and purposeful use of transitions is evident.	
VIDEO PRODUCTION SUBTOTAL (50 points)				

VIDEO EFFECTIVENESS (100 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Topic and Context (X3)	Video does not show clear evidence of where and when the event(s) happened and why.	Video shows where and when the event(s) happened and why they occurred.	Video shows where and when the event(s) happened, why they occurred, and what factors contributed to their development.	
Theme (X2)	The theme is not clear, or the project has a loose-fitting, vaguely stated connection.	Video conveys the theme and implies the connection, however, some clarification is needed.	Video shows a thorough understanding of the theme and clearly uses the theme as a basis throughout.	
Significance of Topic (X2)	Video shows little evidence of the significance/importance of the topic.	Video states the topic's significance adequately.	Video clearly states the significance of the topic.	
Creativity and Originality (X1)	Little original thought or creativity are evident in the design and production of the video.	Original thought and creative elements are expressed and generally highlighted in the video.	Originality and creativity are at the forefront of the video.	
Video Efficacy (X2)	The video does not meet project goals; an unclear, sloppy message is evident.	The video topic is presented with insights; viewer can see that the video adequately meets the objective.	The video is highly focused, with a rich variety of supporting material.	
VIDEO EFFECTIVENESS SUBTOTAL (100 points)				

Rules violations (a deduction of 20% of the total possible points in the semifinalist section) must be initialed by the evaluator, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

TIME DEDUCTION	
Five (5) points is deducted for the video duration exceeding two and one-half (2½) minutes. The video timing commences from the first sound or picture to the final sound or picture.	

PRELIMINARY SUBTOTAL (150 points)	
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SEMIFINAL INTERVIEW (40 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Organization (X1)	Participants seem unorganized and unprepared; an illogical explanation of the design process is given.	Participants are generally prepared; explanation of the design process is communicated and generally organized.	The presentation/interview is logical, well organized, and easy to follow; the design process is communicated in a concise manner.	
Knowledge (X1)	Participants seem to have little understanding of the concepts in their project; answers to questions are vague.	Participants exhibit a general understanding of the concepts in their project.	Participants show clear evidence of a thorough understanding of the concepts in the project.	
Articulation (X2)	Communication of the design process is unclear, unorganized, and or illogical; leadership and/or 21 st century skills are not evident.	Communication of the design process is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the design process is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
SEMIFINAL INTERVIEW SUBTOTAL (40 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
SEMIFINAL SUBTOTAL (40 points)				
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.</p> <p>TOTAL (190 points)</p>				

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

COMMUNITY SERVICE VIDEO EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more (online).
 - 2. Semifinal round, two (2) or more (preferably the same judges as the preliminary round).

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. One (1) stopwatch
 - 5. Results envelope with coordinator forms
- B. Table and chairs for judges

RESPONSIBILITIES

PRE-CONFERENCE

- A. National TSA will collect entries until 11:59 p.m. ET on May 15th and send out receipt confirmations to participants. The results will be shared with the CRC manager, event coordinator, and assigned judges.
- B. Review entries as they are submitted to the designated online storage utility.
- C. Manage communication and pre-conference evaluation (at least two [2] or more judges should be recruited earlier in the year). Coordinate with the Judge Manager.
- D. Collect completed rating forms electronically and bring them to the conference on a flash drive.

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.

- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area or room in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is scheduled to begin, meet with judges to review time limits, procedures, regulations, evaluation, and all other details related to the event.

PRELIMINARY ROUND

- A. On the first full day of the conference, post a list of the twelve (12) semifinalists in random order.

SEMIFINAL ROUND

- A. Semifinalist report at the time and place stated in the conference program to sign up for an interview time.
- B. Semifinalists report at the assigned time and place for the interview.
- C. Manage completion of the on-site interviews.
- D. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry

The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- E. Judges determine the ten (10) finalists and discuss and break any ties.
- F. Submit the finalist results and all related forms in the results envelope to the CRC room.
- G. If necessary, manage security and the removal of materials from the event area.

COMPUTER-AIDED DESIGN (CAD) FOUNDATIONS



OVERVIEW

Applying leadership and 21st century skills, participants demonstrate their understanding of CAD fundamentals as they create a two dimensional (2D) graphic representation of an engineering part or object. For example, participants may be given an isometric drawing and would be expected to generate the required 2D views, complete with dimensions.

ELIGIBILITY

Two (2) individuals per state may participate.

TIME LIMITS

- A. Thirty (30) minutes to set-up
- B. Two (2) hours to develop the drawing(s)
- C. One (1) hour for the evaluation

ATTIRE

TSA competition attire is required.

PROCEDURE

- A. Participants bring their own computer systems to the event area at the time and place stated in the conference program.
- B. Each participant, with one (1) assistant (an instructor, fellow student, or adult chaperone), is allowed thirty (30) minutes to set up and test equipment. At the end of the thirty (30)-minute set-up period, assistants are required to leave the area.
- C. Participants are given a design problem to solve during a two (2)-hour work session.
- D. Participants work independently, without assistance from judges, teachers, or fellow participants.
- E. At the end of the session, participants save their work on their hard drives and back up saved work on a USB flash drive. All USB Flash drives become the property of TSA and will not be returned.

- F. Judges circulate to evaluate the entries and ask questions of the participants.
- G. Participants shall reserve one (1) additional hour for the final evaluation process.
- H. Participants report to the event area at the time and place stated by in the conference program to pick up their equipment.
- I. The top ten (10) finalists are announced during the awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

- A. Participants provide their own computer hardware:
 - 1. Only one (1) CPU and one (1) monitor are allowed per student. Laptop computers are recommended
 - 2. Computers must be equipped with a USB port.
 - 3. Computers must have the all software needed to complete the challenge installed prior to the start of the event.
 - 4. One blank USB flash drive labeled with the registered student identification number, for submission.
 - 5. Power strip/surge protector
 - 6. 20' extension cord
 - 7. Reference materials, which must be printed resources; no online resources will be allowed.
 - 8. Pencils
 - 9. Printers are not necessary.
- B. Participants are provided with sketching paper and electricity.
- C. Participants are advised to save their work onto their hard drives every fifteen (15) minutes.

- D. Participants identify their work using only their student identification number.
- E. TSA DOES NOT PROVIDE INTERNET ACCESS. The use of hotspots are not permitted during the event.
- F. Participants are not permitted to:
 - 1. Leave the event room without permission from the event coordinator. If a participant must use the restroom he/she is accompanied by an escort.
 - 2. Share solutions to problems, reference materials, hardware, or software.
- G. Breakdown of equipment is permitted only after the work of all participants has been evaluated.

EVALUATION

- A. The on-screen design solutions
- B. The interview

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Engineer
- Automobile designer
- CAD professional
- Machine designer

CAD FOUNDATIONS

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ Computer hardware is present
- ☐ USB drive is present
- ☐ ENTRY NOT EVALUATED

LAYOUT (70 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Geometry and Drawing Orientation (X2)	The correct views, constructive geometry, and orientation have not been selected or used throughout the drawing process and final layout.	Most of the views, constructive geometry, and orientation selected and used are correct and in the proper layout.	All of the views, constructive geometry, and orientation that have been selected and used are correct and in the proper layout.	
Line Conventions (X2)	Proper line types have not been used throughout the drawing process.	Most of the proper line conventions have been used, with one or two mistakes.	All of the correct line types are used in the correct locations.	
Dimensioning (X2)	Many of the necessary dimensions are missing or placed incorrectly.	Most of the required dimensions are included and placed correctly.	All of the necessary dimensions are included and correctly placed; this includes hole & thread notes (if applicable).	
Title Block (X1)	The title block is missing or is missing scale, title of drawing, student ID, or date.	The title block is present, but is missing either scale, title of drawing, student ID, or date.	The title block is present and contains all required elements: scale, title of drawing, student ID, and date.	
LAYOUT SUBTOTAL (70 points)				

SOFTWARE UTILIZATION (30 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Application of Drawing Knowledge (X1)	There is little evidence that the student is able to read and interpret mechanical drawings.	There is some evidence that the student is able to read and interpret mechanical drawings.	There is overwhelming evidence that the student can read and interpret mechanical drawings.	
Use of CAD Features and Functions (X2)	There is little evidence of an understanding and application of CAD functions.	There is evidence of a general understanding and effective application of CAD functions.	A complete and effective understanding and application of CAD functions is evident.	
SOFTWARE UTILIZATION SUBTOTAL (30 points)				

INTERVIEW RESPONSE (10 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Articulation (X1)	Communication of the solution is unclear, unorganized, and or illogical; leadership and/or 21 st century skills are not evident.	Communication of the solution is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the solution is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
INTERVIEW SUBTOTAL (10 points)				
<p>Rules violations (a deduction of 20% of the total possible points in the semifinalist sections above) must be initialed by the evaluator, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.</p>				
TOTAL (110 points)				

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

COMPUTER-AIDED DESIGN (CAD) FOUNDATIONS

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges, two (2) or more
- C. Assistants, one (1)

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Results envelope with coordinator forms
- B. One (1) ream of 8½" x 11" white copier paper
- C. Statement of problem as a hard-copy sketch; copies, as needed
- D. Tables and chairs for event coordinator, judges, and participants

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is to begin, meet with judges and assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

ON-SITE CHALLENGE

- A. Check the registration list and assign participants to work stations.
- B. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.
- C. In order to compete, participants must be on the entry list or must have approval of the CRC.
- D. All participants and judges should be in the room at this time. Participants not present may be disqualified.
- E. Allow thirty (30) minutes for participants and their assistants (no more than one [1] per participant) to set up equipment.
- F. At the end of the thirty (30)-minute set-up time, non-participants are required to leave the event area.
- G. Review the time limits, procedures, regulations, and protocol of the event with the participants.
- H. Distribute copies of the CAD problem.
- I. Remind participants to save their work at regular time intervals.
- J. Answer any appropriate questions concerning the CAD problem.
- K. Begin the event and announce the ending time.
- L. Announce the time remaining to work at one (1) hour, thirty (30) minutes, fifteen (15) minutes, and five (5) minutes before time is called.
- M. When time is called, participants stop, save their work on their hard drives, and back-up on their USB flash drives.
- N. Each entry must include the student's identification number.
- O. Participants are required to remain in the area while their entries are being judged, but may be asked to leave the room while judges discuss entries.
- P. Judges circulate and evaluate entries as they are completed.

Q. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:

1. To deduct twenty percent (20%) of the total possible points in this round
2. To disqualify the entry

The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.

R. Breakdown of equipment is permitted only after the work of ALL participants has been evaluated.

S. Judges determine the ten (10) finalists and discuss and break any ties.

T. Submit the finalist results and all related forms in the results envelope to the CRC room.

U. If necessary, manage security and the removal of materials from the event area.

CONSTRUCTION CHALLENGE



OVERVIEW

Applying leadership and 21st century skills, participants submit a scale model, display, and portfolio that documents the design idea, to fulfill an identified community need related to construction. Semifinalists demonstrate expertise in construction design through a presentation and an interview.

ELIGIBILITY

One (1) team per chapter may participate.

TIME LIMITS

PRELIMINARY ROUND

- A. The project must have been in progress or completed during the current school year.

SEMIFINAL ROUND

- A. Up to ten (10) minutes for the presentation/interview.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants identify a community need related to construction and conduct research.
- B. Participants create a scale model/prototype, display, and documentation portfolio while observing the regulations.

PRELIMINARY ROUND

- A. No more than two (2) team representatives report at the time and place stated in the conference program to check in:
 - 1. The scale model/prototype
 - 2. A display
 - 3. A documentation portfolio

- B. Entries are reviewed by judges with neither students nor advisors present based on the following criteria:

- 1. Judges score the Model/Prototype and Display criteria to determine the top twenty-four (24) preliminary contestants, which will not be posted.
- 2. Judges score the Documentation criteria of those top twenty-four contestants to determine the top twelve (12) semifinalist teams.

- C. A list of twelve (12) semifinalist teams (in random order) is posted.

SEMIFINAL ROUND

- A. A representative from each semifinalist team reports at the time and place stated in the conference program to schedule a presentation/interview time.
- B. Two to four (2-4) representatives from each team report at the assigned time and place to participate in a brief presentation, discuss their chapter's community project, and respond to questions.
- C. Participants pick up their entries from the display area at the time specified in the conference program.
- D. Ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRE-CONFERENCE

- A. The chapter must address the impact of the construction project on the community. "Community" is defined as within an area near the school.
- B. Chapters must be involved in the majority of stages of development of the project, from planning to construction (where appropriate), by experiencing as many facets of the undertaking as possible.

- C. The history of long-term or ongoing projects that began in a previous year or that continue beyond the current school year may be included with the documentation, however, the scale model/prototype and portfolio must be based on current year activities.

D. Model/Prototype and Display:

1. The materials that make up the scale model/prototype must be student-constructed and assembled.
2. The display may occupy a space no more than 15" deep x 3' wide x 4' high.
3. A/C electricity may not be used.

- E. Identifying information must not be placed on the scale model/prototype, display, or in the portfolio for the purpose of revealing the TSA chapter, however, the entry is excluded from General Rule D.9, and the chapter name or other identifying information may appear in the entry documentation portfolio but only in newspaper clippings, photographs, etc.

- F. If the entry (scale model/prototype or documentation portfolio) contains images of people, proof of consent must be provided.

1. Minors require parental consent. (See Photo/Film/Video Consent and Release form in Forms Appendix)
2. The consent forms do not count in the page limits identified in Regulation E2.

G. Documentation Portfolio:

1. Documentation materials (comprising "a portfolio") are required and must be secured in a [clear front report cover](#) with the following single-sided, 8½" x 11" pages, in this order:
 - a. Title page with the event title, the conference city and state, the year, and the team/chapter ID number; one (1) page
 - b. Table of contents
 - c. Plan of Work log (see Forms Appendix); pages as needed

- d. Project journal, letters from community members that verify chapter involvement, pictures of the project, newspaper clippings, and other relevant materials; pages as needed
- e. Photo time line of project photos (before, during, and after the project), with dates and team members involved; pages as needed
- f. Research provided on the community need for the project; pages as needed
- g. Strategies and recommendations of the team that address the community need; up to three (3) examples
- h. References and resources in MLA format; pages as needed

PRELIMINARY ROUND

- A. No more than two (2) team representatives set up the entry and submit the portfolio for judging.

SEMIFINAL ROUND

- A. Using leadership and/or 21st century skills, two to four (2-4) representatives are allowed a maximum of ten (10) minutes to present and respond to interview question.

EVALUATION

PRELIMINARY ROUND

- A. Participants' involvement in a community project.
- B. The model/prototype
- C. The display
- D. The documentation portfolio

SEMIFINAL ROUND

- A. The presentation and interview

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Architect
- Community planner
- Construction manager
- General contractor
- Product designer

CONSTRUCTION CHALLENGE

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ Model/Prototype and Display are present
☐ Documentation portfolio is present
☐ ENTRY NOT EVALUATED

DISPLAY (20 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Display (X2)	Display is sloppy and does not represent the project.	Display has some design flaws, but it represents the project.	Display has a high quality of craftsmanship and clearly depicts the project.	
DISPLAY SUBTOTAL (20 points)				

DOCUMENTATION PORTFOLIO (60 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Portfolio Contents (X1)	Portfolio is unorganized and/or is missing three (3) components.	Portfolio is generally organized but is missing two (2) components.	Portfolio content and organization are clearly evident; one (1) or no components may be missing.	
Plan of Work Log (X1)	Log is poorly organized and/or incomplete.	Log is adequately detailed, generally organized, and contains all the required components.	Log is well documented and contains all the required components.	
Project Journal (X1)	Little or no student involvement is evident in the project; work is unorganized and/or sloppy.	Community letters, photos, and/or news clippings documenting student involvement in the project are included in the portfolio.	A well-organized and thorough documentation of student involvement, from inception to completion of the project, is included in the portfolio.	
Photo Timeline (X1)	Photo timeline is sloppy and/or unorganized and hard to read and understand; key dates are missing.	Photo timeline is formatted in a somewhat organized manner and is generally easy to read/interpret; it includes most key dates.	Photo timeline has all key dates listed from inception to completion; the timeline is creative and organized.	

DOCUMENTATION PORTFOLIO (60 points) – continued

Identification of Community Need and Community Impact (X1)	Identification of the community need and impact lacks clarity; wordy, illogical, unorganized explanations are included.	Identification of the community need and impact is generally organized, with a mostly logical explanation and concisely written information.	Clear and concise identification of the community need and impact is evident, with a logical explanation related to the need.
Strategies and Recommendations (X1)	Two (2) or fewer strategies/ recommendations are presented; they are not well-connected to the community need identification.	Two (2) or more strategies/ recommendations are presented; some are connected to the research collected.	Three (3) or more strategies/ recommendations are presented, all of which are connected to the research that was collected and analyzed.

DOCUMENTATION PORTFOLIO SUBTOTAL (60 points)

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

PRELIMINARY SUBTOTAL (80 points)**MODEL (20 points)**

CRITERIA	Minimal performance	Adequate performance	Exemplary performance
	1-4 points	5-8 points	9-10 points
Model (X2)	Model is sloppy and does not represent the project.	Model has some design flaws, but it represents the project.	Model has a high quality of craftsmanship and clearly depicts the project.

MODEL SUBTOTAL (20 points)

Record scores in the column spaces below.

SEMIFINAL PRESENTATION/INTERVIEW (50 points)

CRITERIA	Minimal performance	Adequate performance	Exemplary performance
	1-4 points	5-8 points	9-10 points
Organization (X1)	Participants seem unorganized and unprepared for the presentation/ interview; an illogical explanation of the need and solution is presented.	Participants are generally prepared for the presentation/interview; an acceptable explanation of the need and solution are communicated.	Presentation/interview is logical, well organized, and easy to follow; the need and solution are communicated in an organized and concise manner.
Knowledge (X2)	Participants seem to have little understanding of the concepts in their project; answers to questions may be vague.	Participants exhibit a general understanding of the concepts in their project.	Participants show clear evidence of a thorough understanding of the project.
Articulation (X1)	Communication of the design process is unclear, unorganized, and or illogical; leadership and/or 21 st century skills are not evident.	Communication of the design process is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the design process is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.

Record scores in the column spaces below.

CONSTRUCTION CHALLENGE

SEMIFINAL PRESENTATION/INTERVIEW (50 points) – continued				
Team Participation (X1)	The majority of the delivery is made by one member of the team; the partner(s) may be disengaged from the presentation/interview.	Team members generally are engaged in the presentation/ interview, though one (1) member may take on more responsibility than the other(s).	All team members are actively involved in the presentation/ interview and responses to questions; there is shared responsibility between team members.	
SEMIFINAL PRESENTATION/INTERVIEW SUBTOTAL (50 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
SEMIFINAL SUBTOTAL (70 points)				
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.</p> <p>TOTAL (150 points)</p>				

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

CONSTRUCTION CHALLENGE

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more
- C. Assistants:
 - 1. Two (2) or more individuals assigned to check in, receive entries, and direct students to the display set-up area
 - 2. One (1) individual assigned for security during the set-up time

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stick-on labels for identifying entries
 - 5. Results envelope with coordinator forms
- B. Display tables for entries (needed at set-up time through pick-up time prior to the close of the conference)
- C. Stopwatch to monitor semifinalist presentations and interviews
- D. Tables and chairs for event coordinator and judges

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area or room in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.

- E. At least one (1) hour before the event is scheduled to begin, meet with judges and assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

EVENT CHECK-IN

- A. No more than two (2) team representatives check in:
 - 1. The scale model/prototype
 - 2. The display
 - 3. The documentation portfolio
- B. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.
- C. In order to compete, participants must be on the entry list or must have approval of the CRC.
- D. Requirements for attire do NOT apply during check-in, only on the first day of the conference.
- E. Secure the entries in the designated area.

PRELIMINARY ROUND

- A. Judges independently review the entries based on the following criteria:
 - 1. Judges score the Model/Prototype and Display criteria to determine the top twenty-four (24) preliminary contestants, which will not be posted.
 - 2. Judges score the Documentation criteria of those top twenty-four contestants to determine the top twelve (12) semifinalist teams.
- B. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry

The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.

CONSTRUCTION CHALLENGE

- C. Submit semifinalist results and all related forms in the results envelope to the CRC room.
- D. If necessary, manage security and the removal of materials from the event area.

SEMIFINAL ROUND

- A. One (1) semifinalist team representative reports to the time and place stated in the conference program to sign-up for an interview time.
- B. Two to four (2-4) team representatives report at the assigned time and place for the presentation/interview.
- C. Manage completion of the presentation/interviews.
- D. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- E. Judges determine the ten (10) finalists and discuss and break any ties.
- F. Submit the finalist results and all related forms in the results envelope to the CRC room.
- G. If necessary, manage security and the removal of materials from the event area.
- H. Participants pick up their entries from the display area at the time specified in the conference program.

OVERVIEW

Participants complete a Cybersecurity exam covering general cybersecurity vocabulary and knowledge needed to execute tasks commonly performed by all levels of cybersecurity professionals alike. Using digital presentation software such as Powerpoint, Prezi, or Moovly, participants prepare a presentation, addressing a specific cybersecurity issue, to a group of hypothetical corporate board members (i.e. judges).

Applying leadership and 21st century skills, participants must explain the importance of cybersecurity and why it is essential that the organization invest in such measures. The problem statement will be posted on the [TSA website](#) under Competition/Themes and Problems. Semifinalists exhibit proficiency by recommending security measures to address various scenarios based on factors such as efficiency, feasibility, and ethical impacts.

ELIGIBILITY

Two (2) individuals per chapter may participate.

TIME LIMITS

PRELIMINARY ROUND

- A. One (1) hour to complete the test.

SEMIFINAL ROUND

- A. Ten (10) minutes broken down as follows:
 - 1. Two (2) minutes to set up
 - 2. Six (6) minutes to present and respond to questions; digital presentations may be no more than three (3) minutes in length.
 - 3. Two (2) minutes to take down the presentation.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants access the annual problem posted on the [TSA website](#) under Competition/Themes and Problems.

- B. Participants research the issues surrounding cybersecurity.
- C. Participants create a digital presentation according to the regulations.

PRELIMINARY ROUND

- A. Participants report at the time and place stated in the conference program to take the exam.
- B. A list of twelve (12) semifinalists (in random order) is posted.

SEMIFINAL ROUND

- A. Participants report at the time and place stated in the conference program to sign-up for the presentation.
- B. At least ten (10) minutes prior to the scheduled time, participants report to the event area with their computer hardware.
- C. Participants have ten (10) minutes to present their solution to the judges who act as corporate board members (see Time Limits).
- D. Ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRELIMINARY ROUND

- A. Participants take a multiple choice test to evaluate their knowledge of basic cybersecurity fundamentals.
- B. Tests may be administered online or via a scan-type answer sheet.
- C. Depending on the format of the exam, which will be posted on the Competition Updates page prior to the conference, participants shall be prepared to bring:
 - 1. Two (2) sharpened No.2 pencils
 - 2. One (1) laptop
 - 3. Extra charged laptop battery

- D. Should the test be administered online, participants are required to use their own laptops to take the timed exam. Participants will not:
 - 1. be required to download software on-site.
 - 2. have access to electrical power/outlets during the event.
- E. Participants will:
 - 1. be given one (1) hour to complete the sixty (60)-question exam with one (1) minute to read and answer each question.
 - 2. not be allowed to reference resources when taking the exam.
- F. Participants do not have access to the Internet during the event and may need to supply their own Internet depending upon the format of the exam.

SEMIFINAL ROUND

- A. Participants enter the semifinal challenge with the following scenario in mind:
 - 1. You are an employee at a large firm that is in need of cybersecurity as a result of a recent event (see Competitions/Themes and Problems on the [TSA website](#)). You must convince the corporate board members (i.e. judges) to invest in cybersecurity for the firm.
- B. Participants must bring one (1) laptop or other presentation hardware (such as an I-Pad).
- C. The Presentation:
 - 1. No identifying information other than the participant's identification number and conference title and year are permitted. Identification information shall be the listed on the title page of the presentation.
 - 2. Internet access will not be provided; all presentation materials must be saved on the presentation hardware.
- 3. Participants shall focus on the following in their presentation:
 - a. Identify and explain the security problem.
 - b. Explain how physical and digital security measures protect electronic information.
 - c. Use real-world data metrics and situations to support the claim.
 - d. Explain trade-offs when selecting and implementing cybersecurity recommendations.
- 4. Participants must use fictitious company names if needed for both the company in which the participant is "employed," as well as the fictitious company offering cybersecurity services. Real names may not be used.
- 5. Participants may use the presentation platform of their choice. Video formats may be used (such as Moovly), however, audio may not be used.
- 6. The participant must orally present key points to the corporate board members.
- 7. Presentations shall not last longer than three (3) minutes. Points will be deducted for presentations exceeding this time limit.
- 8. Highlight your proposal with creative visual elements (e.g. graphics, photos, titles, transitions) to actively engage the audience. Participants may use images and video clips "labeled for reuse," but must properly cite the source (refer to the General Rules).
- D. No commercial or copyrighted material may be used. If the entry contains images of people, proof of consent must be provided for each person in the presentation.
 - 1. Minors require parental consent
 - 2. Use the Photo/Film/Video Consent and Release form (see Forms Appendix) for any individuals included in the presentation.
 - 3. Participants must attach the consent forms as the last pages of the digital presentation.

RESOURCES

- A. Organizing a Visual Presentation—An overview of the steps involved in organizing a visual presentation: 2012books.lardbucket.org/books/successful-writing/s18-01-organizing-a-visual-presentati.html
- B. Designing an Influential Presentation— Overview of how to tailor a presentation to influence an audience: www.presentation-pointers.com/showarticle/articleid/374
- C. Moovly—Build animated content using a library of objects: www.moovly.com
- D. Free Presentation Tools— A roundup of presentation tools that are free (or have a free level): guthriejensen.com/blog/free-presentation-tools
- E. Making Videos from PowerPoint Presentations—Learn step-by-step how to create an HD YouTube video from a PowerPoint presentation and a companion audio recording: www.youtube.com/watch?v=aNkfZvjPHFE

EVALUATION

PRELIMINARY ROUND

- A. The test score

SEMIFINAL ROUND

- A. The presentation

Refer to the official rating form for more information.

STEM INTEGRATION

Depending upon the subject of the problem, this event may align with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Information support & services
- Network systems
- Programming & software development
- Web & digital communications
- Technical support specialist
- Computer software engineer
- Cybersecurity engineer
- Cryptographer
- Cyber Crime Investigator
- Cyber defense incident responder
- Cyber forensics expert
- Cyber legal advisor
- Cyber operator
- Vulnerability assessor

CYBERSECURITY

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

☐ Computer hardware is present

☐ ENTRY NOT EVALUATED

TEST (50 points)

TEST SUBTOTAL (50 points)

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

PRELIMINARY SUBTOTAL (50 points)

SEMIFINAL PRESENTATION (120 points)

CRITERIA	Minimal performance	Adequate performance	Exemplary performance	Record scores in the column spaces below.
	1-4 points	5-8 points	9-10 points	
PRESENTATION (90 points)				
Identification and Explanation of Issue (X2)	Identification and explanation of the issue is unclear.	Issue is defined and explained appropriately, however, some points need clarification.	A clear and concise definition and explanation of the issue is evident.	
Explanation of Importance (X2)	There is little evidence of research; there is a lack of understanding of the issues cited.	There is some evidence of research; an adequate understanding of the issues is present.	Thorough research is clearly evident with a firm understanding of the issues established.	
Creativity, Aesthetics, and Artisanry (X1)	The presentation lacks creativity; the work is unorganized and sloppy.	Some visual elements of creativity exist in the work; presentation is generally organized in its explanation of the issue and the visual elements somewhat enhance the presentation.	The presentation exudes creativity; essential design principles and elements are well integrated; presentation logically communicates an important idea and is engaging.	

SEMIFINAL PRESENTATION (120 points) – continued**PRESENTATION (90 points) – continued**

Articulation (X2)	Communication of the proposal is unclear, unorganized, and/or illogical; leadership and/or 21 st century skills are not evident.	Communication of the proposal is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the proposal is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
Overall Impact (X2)	The presentation does not detail or enhance the essential components of the participant's problem identification and proposal.	The presentation somewhat enhances the essential components of the participants problem identification and solution.	The presentation greatly details and enhances the essential components of the participant's problem identification and solution.	
STAGE PRESENCE (30 points)				
Delivery (X1)	Participant is verbose and/or uncertain in his/her presentation; participants' posture, gestures, and lack of eye contact diminish the presentation.	Participant is somewhat well-spoken and clear in his/her presentation; participants' posture, gestures, and eye contact are acceptable in the presentation.	Participant is well-spoken and distinct in its presentation; the participants' posture, gestures, and eye contact result in a polished, natural, and effective presentation.	
Appearance (X1)	Participant's appearance is unprofessional, sloppy, and/or inappropriate.	Participant's appearance is adequate and appropriate.	Participant's appearance is clearly exceptional, appropriate, and professional.	
Confidence (X1)	Participant appears nervous during the presentation; poor posture, poor eye contact, and lack of confidence are evident; participant reads the presentation from notes.	Participant is generally poised, displays eye contact, and is confident, with little sign of nervousness; participant reads from the presentation or notes for key points, but presents clearly.	Participant "commands" the room, and is exceptionally poised, confident, and positive; participant does not use rely heavily on the presentation or reference materials.	
SEMIFINAL PRESENTATION SUBTOTAL (120 points)				

TIME DEDUCTIONS

One (1) point per ten (10)-second interval is deducted for speaking over three (3) minutes. Time commences when the competitor begins speaking.		Record scores in the column spaces below.
TOTAL TIME FOR PRESENTATION		
TIME DEDUCTION		
TOTAL TIME DEDUCTIONS		

SEMIFINAL SUBTOTAL (170 points)

To arrive at the **TOTAL** score, add any subtotals and subtract rules violation points, as necessary. **TOTAL (170 points)**

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

CYBERSECURITY

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges, two (2) or more
- C. Assistants for the set-up, monitoring, and clean-up of the preliminary and the semifinal rounds, two (2) or more

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants/proctors
 - 4. Results envelope with coordinator forms
- B. Tables and chairs for participants
- C. Tables and chairs for judges
- D. Coordinators are responsible for creating the test to be administered at the national conference; copies will be provided by the national TSA office
- E. Answer sheets (scan-type) and paper (if applicable)
- F. Extra sharpened No.2 pencils (if applicable)
- G. Twelve (12) copies of a well-written, technologically appropriate problem that can be objectively measured, one (1) copy per individual
- H. Adequate conditions, tools, materials, monitoring, and testing devices for the problem
- I. A projector (if available), and connections for both MAC and PC computers to project the presentation if desired.
- J. Presentation screen or wall to project the presentation (if available)
- K. Stopwatch or clock for the timekeeper

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is to begin, meet with judges to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRELIMINARY ROUND

- A. Prior to the conference, the event coordinator shall become familiar with the format of the exam (refer to the Competition Updates of the [TSA website](#)).
- B. Late participants and/or entries are considered on a case-by-case basis and only when lateness is caused by events beyond the participant's control.
- C. In order to compete, participants must be on the entry list or must have approval of the CRC.
- D. Should the test be administered via scan-type answer sheet, proceed with the following steps:
 - 1. Begin the event at the scheduled time by closing the doors and checking the entry list.
 - 2. All participants should be in the room at this time.
 - 3. Participants registered but not present shall be disqualified.
 - 4. In order to compete, participants must be on the entry list or must have approval of the CRC.
 - 5. Distribute the answer sheet (scan-type) and paper.
 - 6. Monitor the one (1)-hour test.
 - 7. Score the exams if needed.

- E. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entryThe event coordinator, judges and CRC manager must all initial either of these actions on the rating form.
- F. Judges determine the twelve (12) semifinalists and discuss and break any ties.
- G. Submit the finalist results and all related forms in the results envelope to the CRC room.

SEMIFINAL ROUND

- A. Semifinalists report at the time and place stated in the conference program to sign up for a presentation time.
- B. Semifinalists report at the assigned time and place for the on-site challenge with:
 - 1. One (1) laptop, or other presentation hardware (e.g. I-Pad)
- C. Participants do NOT have access to electrical power/ outlets during the event.
- D. Participants do NOT have access to the Internet during the event.
- E. Participants must have the presentation downloaded and accessible on their computers.
- F. Participants may project their presentation via the projector (if available).
- G. Participants are given ten (10) minutes to present, broken down as follows:
 - 1. Two (2) minutes to set up
 - 2. Three (3) minutes for the presentation
 - 3. Five (5) minutes to respond to questions
- H. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- I. Judges determine the ten (10) finalists and discuss and break any ties.
- J. Submit the finalist results and all related forms in the results envelope to the CRC room.
- K. Manage security and the removal of materials from the area.

OVERVIEW

Data science is a broad term for implementing variety of methods to find connections between data to gain insightful knowledge about a particular issue. Data analytics is an even more focused way of sorting through collected data to make predictions.

Applying leadership and 21st century skills, participants conduct research on the annual topic posted on the [TSA website](#) under Competitions/Themes and Problems, document their research in a supporting portfolio and create a display. Semifinalist teams participate in a timed, on-site challenge in which they must review specific data sets, provide insights, make predictions, and present their findings.

ELIGIBILITY

Three (3) teams of two to three (2-3) individuals per state are permitted.

TIME LIMITS

PRELIMINARY ROUND

- A. Five (5) minutes are allowed for the presentation.

SEMIFINAL ROUND

- A. Ten (10) minutes are allowed for data analysis and synthesis.
- B. Three (3) minutes are allowed to present.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants access the annual topic under the Themes and Problems page of the [TSA website](#).
- B. Participants research the issue using credible resources, analyze the data, and draw conclusions.
- C. Participants prepare their documentation and display according to the regulations.

PRELIMINARY ROUND

- A. Participants report at the time and place stated in the conference program to:
 - 1. Set up the static entry display
 - 2. Submit the documentation portfolio
- B. Entries are reviewed by judges and based on the following criteria:
 - 1. Judges score the Display criteria to determine the top twenty-four (24) preliminary contestants, which will not be posted.
 - 2. Judges score the Documentation criteria of those top twenty-four contestants to determine the top twelve (12) semifinalist teams.
- C. A list of twelve (12) semifinalist teams (in random order) is posted.

SEMIFINAL ROUND

- A. A representative from each semifinalist team reports at the time and place stated in the conference program to schedule a time for the on-site challenge.
- B. Semifinalist teams report at the assigned time and place stated in the conference program for the on-site challenge.
- C. Semifinalist teams are allowed ten (10) minutes to review the data set in the holding room.
- D. Late participants will not receive extra time to analyze the data.
- E. After ten (10) minutes has elapsed, semifinalists are given no more than three (3) minutes to present their analysis to the judges.
- F. Teams pick up their entry from the display area at the time and place stated in the conference program.
- G. Ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRELIMINARY ROUND

- A. Participants must understand the fundamental concepts and principles of the contemporary issue researched. Research about the issue shall focus on:
 1. Analysis of the collected data.
 2. Representation of that data in statistical graphs.
 3. Synthesis of the collected data in terms of factors influencing the issue, societal impacts, and ethical considerations.
- B. Display:
 1. The display shall include, at a minimum, the following major key points:
 - a. The team identification number and the event name in the upper-right hand corner of the display. No other identifying information shall be included.
 - b. The definition and explanation of the issue.
 - c. An explanation of the importance of the issue including problems and possible solutions (if applicable).
 - d. Emphasis shall be placed on the graphs, which should depict not only the issue, but any causal factors.
 2. Highlight your display with creative visual elements (e.g. photos, titles) to actively engage the audience. Participants may use images “labeled for reuse,” but must properly cite the source (refer to the General Rules).
 3. No commercial or copyrighted material may be used. If the entry contains images of people, proof of consent must be provided for each person in the presentation.
 - a. Minors require parental consent
 - b. Use the Photo/Film/Video Consent and Release form (see Forms Appendix) for any individuals included in the presentation.
 - c. Participants must attach the consent forms within the documentation portfolio
 4. May be three dimensional as long as it does not exceed the size limitations of 15" deep x 3' wide x 4' high
 5. Any digital display (e.g. I-pad) must fit within the allotted display space.
 6. A/C electricity may not be used.
 7. Dry cell or photo-voltaic cells may be used for power, if desired.
 8. Any power source used must fit within the maximum display area.
 9. No viruses, live plants, or animals may be used as a part of the display.
 10. No harmful or illegal substances may be displayed.
- C. Documentation Portfolio:
 1. The documentation portfolio shall include all supporting material such as research notes, links to articles, sketches, illustrations, etc.
 2. Documentation materials (comprising “a portfolio”) are required and must be secured in a [clear front report cover](#) with the following single-sided, 8½" x 11" pages, in this order:
 - a. Title page that includes the event title, the conference city and state, the year, and the team/chapter ID number; one (1) page
 - b. Supporting materials; maximum of ten (10) pages.
 - c. A summary of the issue, one (1) page
 - d. Analysis of the data collected; pages as needed
 - e. A list of references and credible resources; a minimum of three (3) different types of resources must be used; pages as needed
 - f. Consent forms (if applicable; refer to the display guidelines section of this event)

SEMIFINAL ROUND

- A. The on-site challenge must include all team members.
- B. Participants report at the assigned time and place stated in the conference program and are ushered into the holding room.
- C. Once in the holding room participants are given the data set and have ten (10) minutes analyze the data and draw conclusions.
- D. Participants are permitted to:
 - 1. Use their phones to conduct their research during this time, however, Internet will not be provided
 - 2. Take notes on the index cards (to be provided by TSA)
 - 3. Reference their notes during the on-site challenge presentation to the judges
- E. Participants are NOT permitted to:
 - 1. Use their phones during the presentation to the judges
 - 2. Contact outside sources for assistance while in the holding room.

EVALUATION**PRELIMINARY ROUND**

- A. The display
- B. The documentation portfolio

SEMIFINAL ROUND

- A. Analysis of the on-site challenge
- B. The presentation

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Data scientist
- Data analyst
- Actuary
- Economist
- Epidemiologist
- Forensic accountant
- Market researcher
- Meteorologist
- Operations research analyst
- Quality engineer

DATA SCIENCE & ANALYTICS

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ Display is present
- ☐ Documentation portfolio is present
- ☐ ENTRY NOT EVALUATED

DISPLAY (80 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points	
Explanation of Impacts (X1)	Explanation is missing a discussion of the issue's relevance to environmental, economic, social, and/or ethical considerations.	Explanation addresses some of the issues relevant to environmental, economic, social, and/or ethical considerations.	Explanation includes a full discussion of the issue's relevance to environmental, economic, social, and/or ethical considerations.	
Data Charts and Graphs (X2)	The data is not represented in charts and graphs.	The data is represented in charts and graphs and somewhat supports the analysis of the team.	The data is represented in charts and graphs and supports the analysis of the team.	
Communication of Issue (X2)	It is difficult to understand the issue being communicated in the display; display organization does not aid in conveying the points.	The issue is somewhat communicated by the data presented, imagery, and organization of the display.	The issue is communicated in an organized, clear, and concise manner through effective use of imagery and the display organization.	
Creativity (X2)	The display lacks creativity; no, or very few, design principles are integrated in the display.	Some elements of creativity exist in the display, and essential design principles are generally evident.	The display exudes creativity; essential design principles and elements are well integrated.	
Aesthetics and Artisanry (X1)	Work is unorganized and sloppy; display seems to be an afterthought or thrown together.	Display shows an organized presentation of the issue; design and layout considerations are evident in some aspects.	Display is exemplary in logically communicating important data; design and aesthetics are considered and add to the effectiveness of the display.	
DISPLAY SUBTOTAL (80 points)				

DOCUMENTATION PORTFOLIO (60 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Portfolio (X1)	Portfolio is missing three (3) or more elements.	Portfolio is missing less than three (3) elements.	Portfolio is missing no elements and is thoughtfully constructed.	
Research Base (X2)	Research is inadequate, and/or very few credible sources are referenced.	Research has been conducted appropriately, with some credible sources included.	Research indicates evidence of a comprehensive assortment of materials that are credible sources.	
Support Materials (X2)	Support materials do not help clarify the documentation or are of little significance to the issue.	Support materials are appropriate and help supplement documentation by providing clarity to the issue.	Support materials are of excellent quality; if not original, they are cited; support materials clarify the issue.	
Quality, Effectiveness, and Mechanics (X1)	Portfolio appears to have been thrown together; distracting errors in punctuation, grammar, and spelling are evident in the documentation.	Portfolio is generally organized; punctuation, grammar, and spelling are generally correct, with few errors.	Work is of exceptional quality and well organized; punctuation, grammar, and spelling are correct, with no errors.	
DOCUMENTATION PORTFOLIO SUBTOTAL (60 points)				
Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right. Indicate the rule violated: _____				
PRELIMINARY SUBTOTAL (140 points)				

SEMIFINAL PRESENTATION/INTERVIEW (60 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Articulation (X2)	The analysis is full of illogical thoughts that lack clarity, and/or there is insufficient supporting information provided; leadership and/or 21 st century skills are not evident.	The analysis is somewhat logical, generally easy to follow, and/or there is sufficient supporting information provided; leadership and/or 21 st century skills are somewhat evident.	The analysis is clear, concise, and there is ample supporting information provided; leadership and/or 21 st century skills are clearly evident.	
Knowledge (X2)	Participants seem to have little understanding of the concepts in their analysis; responses to questions may be vague.	Participants exhibit a general understanding of the concepts in their analysis.	Participants show clear evidence of a thorough understanding of data analysis; the analysis is accurate and supported by evidence.	
Delivery (X1)	The team is verbose and/or uncertain in their analysis; the participants' posture, gestures, and lack of eye contact diminish the delivery; participants rely too heavily on the notes.	The team is somewhat well-spoken and clear in their analysis; participants' posture, gestures, and eye contact result in an acceptable delivery; participants rely on the notes.	The team is well-spoken and distinct in its presentation/interview; participants' posture, gestures, and eye contact result in a polished, natural, and effective delivery.	

SEMIFINAL PRESENTATION/INTERVIEW (60 points) – continued			
Team Participation (X1)	The majority of the presentation is made by one member of the team; the partner(s) may be disengaged.	Team members are generally engaged in the process, though one member may take on more responsibility than the other(s).	All team members are actively involved in the presentation.
SEMIFINAL PRESENTATION/INTERVIEW SUBTOTAL (60 points)			
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>			
SEMIFINAL SUBTOTAL (60 points)			
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.</p> <p>TOTAL (200 points)</p>			

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

DATA SCIENCE AND ANALYTICS

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more
- C. Assistant, one (1)

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stick-on labels for identifying entries
 - 5. Results envelope with coordinator forms
 - 6. Notecards (any size)
 - 7. Pencils/pens
- B. Measuring tape for judges
- C. Display tables for entries
- D. Table and chairs for event coordinator and judges

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough judges have been scheduled.
- D. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, tables, chairs, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is to begin, meet with judges and assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

EVENT CHECK-IN

- A. Check in the entries at the time stated in the conference program. Participants:
 - 1. Set up the static entry display
 - 2. Submit the documentation portfolio
- B. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.
- C. In order to compete, participants must be on the entry list or must have CRC approval.
- D. Requirements for attire do NOT apply during check-in, only on the first day of the conference.
- E. Each entry must include the team's identification number in the upper right-hand corner of the entry.
- F. Instruct participants to position the entries for viewing.
- G. Secure the entries in the designated area.

PRELIMINARY ROUND

- A. Entries are reviewed by judges based on the following criteria:
 - 1. Judges score the Display criteria to determine the top twenty-four (24) preliminary contestants, which will not be posted.
 - 2. Judges score the Documentation Portfolio criteria of those top twenty-four contestants to determine the top twelve (12) semifinalist teams.
- B. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry

The event coordinator, judges and CRC manager must all initial either of these actions on the rating form.
- C. Judges determine the twelve (12) semifinalists.
- D. Submit the finalist results and all required forms in the results envelope to the CRC room.

SEMIFINAL ROUND

- A. A representative from each semifinalist team reports to the time and place stated in the conference program to sign-up for the on-site challenge.
- B. Semifinalist teams report at the assigned time and place stated in the conference program for the on-site challenge.
- C. Semifinalist teams are allowed ten (10) minutes to review the data set in the holding room.
- D. Semifinalists are permitted to:
 - 1. Use their phones to conduct their research in the holding room, however, Internet will not be provided
 - 2. Take notes on the index cards (to be provided by TSA)
 - 3. Reference their notes during the on-site challenge presentation to the judges
- E. Semifinalists are not permitted to:
 - 1. Use their phones during the on-site challenge presentation to the judges
 - 2. Contact outside sources for assistance while in the holding room
- F. After ten (10) minutes has elapsed, semifinalists are given no more than three (3) minutes to present their analysis to the judges.
- G. While the team is presenting, the assistant ushers the next team into the holding room. Repeat this step until all the semifinalists have had the chance to present.
- H. Judges use the same official rating form for both the preliminary and semifinal round of evaluation.
- I. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- J. Judges determine the ten (10) finalists and discuss and break any ties.
- K. Submit the finalist results and all required forms in the results envelope to the CRC room.
- L. If necessary, manage security and the removal of materials from the event area.

OVERVIEW

Applying leadership and 21st century skills, participants produce a digital photographic portfolio that represents or relates to a chosen theme posted on the [TSA website](#) under Competitions/Themes and Problems. Semifinalists demonstrate competency in the production of a series of digital photographs taken at the conference site within the time limit specified.

ELIGIBILITY

Three (3) individuals per state may participate.

TIME LIMITS

PRELIMINARY ROUND

- A. All components of the chapter's entry must be finished, submitted, and accessible via the Internet by 11:59 p.m. ET on May 15th.
- B. Email verification of each team's entry will be made by June 10th.

SEMIFINAL ROUND

- A. One-half (½) hour is allowed to set up equipment and receive the on-site task and procedures.
- B. Two (2) hours are allowed to complete the on-site task.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants review the annual theme posted on the [TSA website](#) under Competitions/Themes and Problems.
- B. Participants produce a digital photographic portfolio while observing the regulations.
- C. Participants submit the entry by 11:59 p.m. ET on May 15th. Submission information will be provided on the [TSA website](#) under Competition Updates.

- D. Email verification of each team's entry will be made by June 10th.

PRELIMINARY ROUND

- A. A list of twelve (12) semifinalist teams (in random order) is posted on-site on the first full day of conference.

SEMIFINAL ROUND

- A. Participants report at the time and place stated in the conference program for the on-site challenge with all of the required equipment and software noted in the event Regulations section.
- B. Participants are allowed one-half (½) hour to set up and test their equipment.
- C. At the end of the set-up time, the event coordinator presents the on-site task and related procedure to the semifinalists.
- D. The task involves students taking photographs addressing a specific theme, or documenting a current aspect of the conference, such as a competitive event, a special focus of the site, a general session, etc.
- E. Participants are responsible for supplying USB flash drives for the on-site challenge.
- F. Semifinalists are given two (2) hours to complete the task, including taking their pictures, and editing or enhancing them.
- G. The semifinalists save the final photos in a multimedia presentation on the USB flash drives, which will become property of TSA.
- H. The participant signs up for a presentation/interview time once the two (2) hours has concluded.
- I. Participants report at the assigned time and place stated in the conference program for the presentation/interview.
- J. Judges assess the entries and the interview responses.
- K. The top ten (10) finalists are announced at the awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRE-CONFERENCE

- A. Photographs included in the portfolio must be unified.
- B. Participants are solely responsible for all aspects of the competition, including taking the photographs, editing, and completing the portfolio.
- C. Digital Photographic Portfolio:
 1. The digital photohraphic portfolio is required and must be submitted as a multi-page PDF document with pages in this order:
 - a. Cover page – must include the event title, the conference city and state, the year, the participant's ID number.
 - b. Summary of the theme must follow the annual challenge, including a detailed description of how the theme was interpreted by the participant, why the particular subjects were chosen, as well as the challenges that were faced in the selection of the subjects, in taking the photos, and in selecting and editing the final images.
 - c. Photos:
 - i. Originality: photos must be taken, edited, and saved digitally by the participant, with no assistance.
 - ii. Submission: the original photo and the edited version should appear together on the same page and must be labeled "ORIGINAL" and "EDITED."
 - iii. The next page should include descriptions of the preceding photos along with a synopsis of how the original photo was edited/changed, and the rationale surrounding how the theme specifically is addressed by both the style and content of the photo.
 - iv. Enhancements and/or editing should be done ethically and in a way that makes a better photograph.
 - d. Resource page – must include a list of resources used to complete the album, including camera, software, and hardware, etc.
 - e. Consent and Release Forms – Recognizable individuals pictured in the images must give their written consent before the images can be used in this event (see Photo/Film/Video Consent and Release form in Forms Appendix). All consent forms must be included in the multi-page PDF album. **NOTE: If consent forms are missing, the entry will not be judged.**
- D. The entry must be finished, submitted, and accessible via the Internet by 11:59 p.m. ET on May 15th.
- E. Entries received, or changes made to submitted entries after this deadline will not be judged.

SEMIFINAL ROUND

- A. Participants are required to provide their own equipment, including:
 1. A computer system (laptop preferred) with software installed.
 2. A method to transfer the images to the computer (such as a media reader) for editing, and to the USB drives
 3. USB drive(s); The USB flash drives and the images contained therein become property of National TSA, Inc., and will not be returned. The images may be used in future TSA promotional materials and publications.
 4. Power Strip
 5. Extension cord
 6. Tripod
 7. DSLR or dedicated "point-and shoot" camera, with a timer feature and/or remote trigger as well as the ability to be mounted to a tripod; Cell phones are NOT permitted as cameras
 8. Semifinalists may bring optional related accessories (i.e., filters, reflectors, extra batteries, etc.) to use in the on-site competition.

- B. No internet access will be provided during the competition.
- C. When preparing their multimedia presentation, semifinalists must include the following information for each photograph:
1. Camera make (e.g. Nikon, Canon, Panasonic, Sony, etc.)
 2. Camera model (e.g. CoolPix, Rebel, 5D, etc.)
 3. F-stop at which each photograph was taken
 4. Exposure time of each photograph
 5. ISO value, aperture (f-stop number), and shutter speed
 6. How the photo relates to the on-site challenge

EVALUATION

PRELIMINARY ROUND

- A. The digital photographic portfolio

SEMIFINAL ROUND

- A. The multimedia presentation
B. The presentation/interview

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Animator
- Photojournalist
- Research and development scientist
- Reporter
- Website designer

DIGITAL PHOTOGRAPHY

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ Digital portfolio was submitted pre-conference and scored
- ☐ Consent/Release forms are present (if required)
- ☐ Equipment is present (semifinalists only)
- ☐ ENTRY NOT EVALUATED

DIGITAL PHOTOGRAPHIC PORTFOLIO 60 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points	
Principles and Elements of Design and Composition and Creativity (X2)	There is little or no evidence of an understanding or creative use of compositional elements (line, shape, form, value, space, texture, color, framing, emphasis, balance, unity, contrast, movement/rhythm and pattern/repetition).	Images demonstrate some knowledge and creative use of compositional elements (line, shape, form, value, space, texture, color, framing, emphasis, balance, unity, contrast, movement/rhythm and pattern/repetition).	Images clearly demonstrate excellent and creative use of a variety of compositional elements (line, shape, form, value, space, texture, color, framing, emphasis, balance, unity, contrast, movement/rhythm and pattern/repetition).	
Technical Quality (X1)	Photos are out of focus; blurriness is unintentional and does not contribute to the overall composition; photos display incorrect exposure values, white balance, and/or range of tones; there is little or no consideration given to lighting and/or special effects.	Photos are in focus; photos display correct exposure values, white balance, and/or range of tones; images exhibit some attention to lighting and/or the use of special effects.	Photo subject(s) are in sharp focus; blurriness is used effectively to enhance the composition; photos display correct exposure values, white balance, and/or range of tones; images are enhanced by attention to lighting and/or the use of special effects.	
Conveyance of the Theme (X1)	The images are flat and lack a clear connection to the theme; viewers are not drawn into the scene; images do not clearly convey the theme/challenge.	The images show some emotional depth; viewers make an emotional connection with the images/pictures and are drawn into the scene or learn something from the subject(s); images convey the competition theme/challenge.	The images show emotional depth; viewers make an instant emotional connection with the pictures and are drawn into the scene or learn something from the subject(s); images clearly convey the competition theme/challenge.	
Written Statements (X1)	A written statement may or may not accompany each photo, and/or the statement includes only some of the photo's meta data (camera make/model, f/stop, exposure time, ISO speed, focal length), and/or an explanation of the relevance of the image to the challenge is not present and/or is written poorly.	A written statement accompanies each photo; the statement includes most of the photo's meta data (camera make/model, f/stop, exposure time, ISO speed, focal length); an explanation of the relevance of the image to the challenge is included.	A written statement accompanies each photo; the statement includes the photo's meta data (camera make/model, f/stop, exposure time, ISO speed, focal length); an explanation of the relevance of the image to the challenge is presented in a clear and concise manner.	
Resources/References (X1)	A reference list is present, but graphic and/or software packages used are not mentioned, and/or MLA format is not used, and/or the citations are inadequate.	A reference list is present and the primary software packages used are included; MLA format is used for an adequate number of resources.	Detailed and concise resources/references are provided; all software packages used are included; MLA format is used for the citations.	

DIGITAL PHOTOGRAPHIC PORTFOLIO SUBTOTAL (60 points)

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

PRELIMINARY SUBTOTAL (60 points)**SEMIFINAL CHALLENGE (70 points)**

CRITERIA	Minimal performance	Adequate performance	Exemplary performance	Record scores in the column spaces below.
	1-4 points	5-8 points	9-10 points	
Principles and Elements of Design/Composition and Creativity (X2)	There is little or no evidence of an understanding or creative use of compositional elements (line, shape, form, value, space, texture, color, framing, emphasis, balance, unity, contrast, movement/rhythm and pattern/repetition).	Images demonstrate some knowledge and creative use of compositional elements (line, shape, form, value, space, texture, color, framing, emphasis, balance, unity, contrast, movement/rhythm and pattern/repetition).	Images clearly demonstrate excellent and creative use of a variety of compositional elements (line, shape, form, value, space, texture, color, framing, emphasis, balance, unity, contrast, movement/rhythm and pattern/repetition).	
Technical Skill (X2)	Participants do not demonstrate knowledge of and understanding of how to utilize photographic equipment and techniques; participants show little or no creativity in staging and photographing subjects.	Participants demonstrate some knowledge of and an understanding of how to utilize photographic equipment and techniques, or use it only minimally in the on-site challenge; participants show some creativity in staging and photographing subjects.	Participants clearly demonstrate knowledge and understanding of how to utilize photographic equipment and techniques; participants show creativity in staging and photographing subjects; participants show a high level of skill in the use of the tools to create high quality images.	
Technical Quality (X1)	Photos are out of focus; blurriness is unintentional and does not contribute to the overall composition; photos display incorrect exposure values, white balance, and/or range of tones; there is little or no consideration given to lighting and/or special effects.	Photos are in focus; photos display correct exposure values, white balance, and/or range of tones; images exhibit some attention to lighting and/or the use of special effects.	Photo subject(s) are in sharp focus; blurriness is used effectively to enhance the composition; photos display correct exposure values, white balance, and/or range of tones; images are enhanced by attention to lighting and/or the use of special effects.	
Impact and Theme (X1)	The images are flat and lack emotional depth; viewers are not drawn into the scene; images do not clearly convey the theme/challenge.	The images show some emotional depth; viewers make an emotional connection with the images/pictures and are drawn into the scene or learn something from the subject(s); images convey the competition theme/challenge.	The images show emotional depth; viewers make an instant emotional connection with the pictures and are drawn into the scene or learn something from the subject(s); images clearly convey the competition theme/challenge.	
Written Statements (X1)	A written statement may or may not accompany each photo, and/or the statement includes only some of the photo's meta data (camera make/model, f/stop, exposure time, ISO speed, focal length), and/or an explanation of the relevance of the image to the challenge is not present and/or is written poorly.	A written statement accompanies each photo; the statement includes most of the photo's meta data (camera make/model, f/stop, exposure time, ISO speed, focal length); an explanation of the relevance of the image to the challenge is included.	A written statement accompanies each photo; the statement includes the photo's meta data (camera make/model, f/stop, exposure time, ISO speed, focal length); an explanation of the relevance of the image to the challenge is presented in a clear and concise manner.	
SEMIFINAL CHALLENGE SUBTOTAL (70 points)				

SEMIFINAL PRESENTATION/INTERVIEW (60 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Organization Use of visual materials (X1)	Participant seems unorganized and unprepared for the presentation/interview; illogical explanation of the photographs and/or stylistic elements is presented.	Participant is generally prepared for the presentation/interview; explanation of photographs and/or stylistic elements is communicated and somewhat organized.	The presentation/interview is logical, well organized, and easy to follow; explanation of the photographs and/or stylistic elements are communicated in an organized and concise manner.	
Knowledge (X1)	Participant seems to have little understanding of the stylistic photographic elements used.	Participant exhibits an understanding of the stylistic photographic elements used in their project; the presentation is for the most part, logical and/or clear.	Participants show clear evidence of a thorough understanding of the stylistic photographic elements; the presentation is concise and logical.	
Articulation (X1)	Communication of the design process is unclear, unorganized, and or illogical; leadership and/or 21 st century skills are not evident.	Communication of the design process is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the design process is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
Integration of Theme (X2)	The current theme is not demonstrated in the product.	The current theme is adequately demonstrated in the product.	The current theme is exceptionally well demonstrated in the product.	
Delivery (X1)	The participant is verbose and/or uncertain in his/her presentation/interview; participants' posture, gestures, and lack of eye contact diminish the presentation/interview.	The participant is somewhat well-spoken and clear in his/her presentation/interview; participants' posture, gestures, and eye contact are acceptable in the presentation/interview.	The participant is well-spoken and distinct in its presentation/interview; the participants' posture, gestures, and eye contact result in a polished, natural, and effective presentation/interview.	
SEMIFINAL PRESENTATION/INTERVIEW SUBTOTAL (60 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
SEMIFINAL SUBTOTAL (130 points)				
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary. TOTAL (190 points)</p>				

<p>Comments:</p> <p>I certify these results to be true and accurate to the best of my knowledge.</p> <p>JUDGE</p> <p>Printed name: _____ Signature: _____</p>

DIGITAL PHOTOGRAPHY

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more (online)
 - 2. Semifinal round, two (2) or more

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Results envelope with coordinator forms
- B. Semifinal round materials
 - 1. Evaluation schedule
 - 2. Task and guidelines
 - 3. Blank stick-on labels for USB identification
 - 4. Interview questions
 - 5. One projector
 - 6. One white board or wall to project the multimedia presentation
 - 7. One laptop with USB capabilities

RESPONSIBILITIES

PRE-CONFERENCE

- A. National TSA will collect entries until 11:59 p.m. ET on May 15th and send out receipt confirmations to participants. The results are shared with the CRC manager, event coordinator, and assigned judges.
- B. Review entries as they are submitted to the designated online storage utility.
- C. Manage communication and pre-conference evaluation (at least two [2] or more judges should be recruited earlier in the year). Coordinate with the Judge Manager.
- D. Collect the rating forms electronically and bring them to conference on a flash drive.

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area or room in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is to begin, meet with judges and assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRELIMINARY ROUND

- A. On the first full day of the conference, post a list of the twelve (12) semifinalists in random order.

SEMIFINAL ROUND

- A. Before the on-site task session, check the room set-up. There should be enough seating, table space, and access to electricity for twelve (12) semifinalists.
- B. Participants must provide their own equipment, including computers and cameras. Label the USBs with the semifinalists' identification numbers.
- C. Begin the event at the scheduled time by closing the doors and checking the entry list.
- D. Late entries are considered on a case-by-case basis and only when the lateness is caused by circumstances beyond the participant's control.
- E. In order to compete, participants must be on the entry list or must have approval of the CRC.
- F. All participants should be in the room at this time. Participants registered but not present may be disqualified.
- G. Review the on-site task and procedures with the participants.

- H. Manage the semifinalist session with judges, who may observe participants taking pictures or editing.
- I. As participants complete the on-site challenge, collect the USB's and manage the removal of participants' equipment.
- J. As participants depart, ensure they sign up for the presentation/interview.
- K. Judges independently score the multimedia presentation.
- L. Participants report at the time and place stated in the conference program for the presentation/interview.
- M. If available, project the multimedia presentation during the presentation/interview.
- N. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entryThe event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- O. Judges determine the ten (10) finalists and discuss and break any ties.
- P. Submit the finalist results and all related forms in the results envelope to the CRC room.
- Q. If necessary, manage security and the removal of materials from the event area.

OVERVIEW

Applying leadership and 21st century skills, participants design, produce a working drawing for, and build a CO₂-powered dragster according to stated specifications, using only specified materials.

ELIGIBILITY

Two (2) individuals per chapter may participate.

TIME LIMITS

- A. The dragster and drawing are submitted at the time and place stated in the conference program.
- B. Sixteen (16) qualifying car builders participate in a five (5)-minute interview.
- C. Drawings and cars must be picked up at the specified time and place stated in the conference program.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants design and create their dragster while working within the required specifications and considering the current year's special design requirements.

PRELIMINARY ROUND

- A. Participants check in the following at the time and place stated in the conference program:
 - 1. The dragster
 - 2. A full-size metric drawing of the completed vehicle
- B. Entries are reviewed by judges to determine specification adherence and safety on the track.
- C. Safe dragsters race for qualifying time on the same lane of a raceway.
- D. The top sixteen (16) qualifying cars, based on time trials, are evaluated against the criteria for this event.

- E. Dragsters that do not meet event regulations are disqualified and lower qualifying cars are moved up until sixteen (16) dragsters meeting specifications are determined.

SEMIFINAL ROUND

- A. The top sixteen (16) car builders report to the track at the posted time for a five (5)-minute interview.
- B. The top sixteen (16) cars race in a double-elimination format to earn points for the race portion of the event.
- C. Drawing, design, and body finish points are combined with race points to determine the final standings.
- D. Ten (10) finalists are announced during the conference award ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

- A. Participants review the current year's design challenge specifications.
- B. Drawings:
 - 1. A two (2)-view (top and side) working drawing with metric dimensions must be made on 11" x 17" drawing paper.
 - 2. The drawing must be developed using standard engineering practices and procedures; it may be produced using traditional drafting methods or CAD.
 - 3. The title block includes only the student's identification number, which is assigned at conference registration and is placed on the entry and drawing during check-in.
- C. Dragsters that do not meet the following specifications and tolerances are disqualified from the race.

Dragster body		
	MINIMUM	MAXIMUM
1. One (1)-piece, all-wood construction a. Two (2) or more like or unlike pieces of wood glued together are not considered one (1)-piece, all-wood construction. b. Any type of lamination will result in disqualification. c. No add-ons, such as body strengtheners, fenders, plastic canopy, exhausts, or air foils may be attached to or enclosed within the vehicle. d. Fiberglass and shrink wrap are considered body strengtheners and cannot be used on the car body for any reason. e. Decals may be used for decoration only; they may not be used to gain an aerodynamic advantage, i.e., decals cannot cover the exterior axle holes or be used to cover open areas of the body.		
2. Body length	280mm	300mm
3. Body height with wheels		75mm
4. Body mass (completed car without CO ₂)	*(2020) – 50g	80g
* denotes specific school year requirement	*(2021) – 60g	85g
5. Body width at the point the axles pass through the body, front and back	35mm	42mm
6. Vehicle total width (including wheels).		90mm

Axles/axle holes/wheelbase		
	MINIMUM	MAXIMUM
1. Dragsters must have two (2) axles per car, no more.		
2. Bottom of axle hole or bearing above bottom of car body. (NOTE: This will be only be measured at the side surfaces of the wood car body at the axle hole.)	5mm	10mm
3. Axle hole from front and rear of car	10mm	100mm
4. Wheelbase (axle distance apart at farthest points)	105mm	250mm
5. Bearings, bushings and lubricants may be used.		
6. Glue may only be used to secure bearings to body.		

Spacer washers/clips		
	MINIMUM	MAXIMUM
1. Spacer washers		10
2. Axle clips		4
3. Silicone or any other type of glue/adhesive may not be used in place of wheel clips to hold wheels or axles in place.		

Power plant (CO₂ cartridge hole)

	MINIMUM	MAXIMUM
1. The power plant hole must be at the farthest point at the rear of the car and must be drilled parallel to the racing surface to assure proper puncture of the CO ₂ cartridge.		
a. A minimum of 3mm thickness around the entire power plant hole must be maintained on the dragster for safety.		
b. There should be no paint inside the CO ₂ cartridge hole.		
2. Hole depth	45mm	55mm
3. Safety zone thickness	3mm	
4. Chamber diameter	19mm	20mm
5. Lowest point of chamber diameter to race surface (with wheels)	26mm	40mm

Eye screws

	MINIMUM	MAXIMUM
1. Dragsters must have no more than two (2) eye screws per car that meet tolerances.		
a. Eye screws must not make contact with the racing surface.		
b. The track string must pass through both eye screws, which are located on the center line of the bottom of the car.		
c. Glue may be used to reinforce the eye screws.		
d. It is the responsibility of the car designer/engineer to see that the eye screw holes are tightly closed to prevent the track string from slipping out.		
e. Any adjustments must be done prior to event check-in.		
2. Inside diameter	3mm	5mm
3. Distance apart (at farthest points)	150mm	270mm

Wheels

	MINIMUM	MAXIMUM
1. A dragster must have exactly four (4) wheels, each of which separately must meet regulations in items in 2 and 3 below.		
a. All four (4) wheels must touch the racing surface at the same time.		
b. All wheels must roll.		
c. Wheels must be made entirely from plastic.		
d. Dimensions must be consistent for the full circumference of the wheel.		
2. Wheel diameter	30mm	40mm
3. Wheel width*	2mm	18mm

* Width is determined by the continuous point of contact between the wheel and track or flat surface.

D. Race:

1. The official distance between the start line and the finish line on the race track is twenty (20) meters.
2. No repair or maintenance is allowed after the entries have been registered.
3. Any entry damaged during the race is evaluated by the event coordinator to determine whether or not the vehicle is allowed to race again.
4. In the event that the vehicle is damaged by conference personnel, the event coordinator rules as to whether or not the vehicle may be repaired by the student entering the vehicle. This is the only reason a student is allowed to touch his/her vehicle after registration.
5. Cars that lose wheels, bearings, screw-eyes will not continue to race.
6. Damaged wheels may not be replaced.
7. All CO₂ cartridges for the race are provided by national TSA.

EVALUATION

- A. The car
- B. The drawing
- C. Placement in the double elimination on-site race
- D. The interview

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Aeronautical engineer
- Automotive designer
- Automotive modeler
- Industrial designer
- Industrial engineer
- Mechanical engineer
- Race car engineer

DRAGSTER

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ Dragster is present
- ☐ Technical drawing is present
- ☐ Car is safe to race
- ☐ ENTRY NOT EVALUATED

DRAGSTER CONSTRUCTION (50 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points	
Dragster Body Production Quality (X1)	Dragster exhibits poor production quality; little or no attention to detail is evident; surface is crude and rough.	Dragster shows evidence of proper production techniques; dragster is adequate but needs improvement.	Excellent production techniques are displayed in the dragster; obvious attention to detail and quality is evident.	
Body Paint/Finish (X1)	Surface preparation is inadequate; body is unprimed, with poorly applied final finish.	Dragster body is painted and finished but not in a quality way; body is dull and sticky.	Dragster body finish is exemplary; body is smooth, shiny, and exhibits quality.	
Vehicle Assembly (X1)	Dragster exhibits poor or sloppy assembly of parts (loose wheels, eye screws are not level, and/or they are loose, etc.).	Dragster is well assembled, and adequately meets standards.	Dragster is properly assembled, with obvious evidence of attention to detail.	
Drawing Scale and Dimensioning (X1)	Drawing is present, but it is not to scale; dimensions are missing, or dimensioning is poorly done.	Drawing is acceptable, true to scale, and it is a close representation of the vehicle; some dimensions are missing.	Drawing is exemplary, exact, and includes all pertinent dimensions.	
Drawing Completion and Quality (X1)	Drawing work is sloppy, missing parts, and lacking quality.	Drawing is complete; quality is average.	Drawing is complete, precise, and of exceptional quality.	
DRAGSTER CONSTRUCTION SUBTOTAL (50 points)				

INTERVIEW (20 points)								Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance		Exemplary performance				
	1-4 points	5-8 points		9-10 points				
Car Builder Interview (X2)	The participant demonstrates limited knowledge and has difficulty articulating the design process; there are signs of lack of involvement in the production or processes; leadership and/or 21 st century skills are not evident.	The participant demonstrates adequate knowledge of the design processes; leadership and/or 21 st century skills are somewhat evident.		The participant demonstrates competence and knowledge related to the design and production of the dragster and able to articulate the "reasoning" behind the decisions made; leadership and/or 21 st century skills are clearly evident.				
INTERVIEW SUBTOTAL (20 points)								
PRELIMINARY SUBTOTAL (70 points)								
RACE (60 points)								
1st	2nd	3rd	4th	5th & 6th	7th & 8th	9th-12th	13th – 16th	
60 Points	55 Points	50 Points	45 Points	40 Points	35 Points	30 Points	25 Points	
RACE SUBTOTAL (60 points)								
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>								
SEMIFINAL SUBTOTAL (60 points)								
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.</p>								
TOTAL (130 points)								

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

DRAGSTER

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more
- C. Recorder for double elimination chart, one (1)
- D. Assistants, two (2)

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stick-on labels for identifying entries (three [3] per entry; one [1] each for the car and plans)
 - 5. Time trial record sheet
 - 6. Qualifier Interview Time Slot sheet
 - 7. Double elimination bracket chart
 - 8. Results envelope with coordinator forms
- B. CO₂ cartridges
- C. Go/No-Go gauges for all judges
- D. Metric scientific scales (triple beam balance or digital)
- E. Mono-filament fishing line (50lb) for track (4 pre-tied, 2 on track, and 2 reserve)
- F. Race track set, including a starting gate and a finish gate with digital timer and winning lane indicator
- G. Padding for the finish gate
- H. One (1) or more test cars
- I. Tables for the display of cars and for evaluation
- J. Table at the starting line for arranging and holding cars prior to the races
- K. Table at the finish gate for the placement of cars after the races and to hold eliminated cars
- L. Table for the official time keeper

- M. When using a computer controlled track, provide the proper computer for the software being used, all necessary connections, and a printer (placed on the official time keeper's table)
- N. A method for displaying the time trial and race brackets

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area or room in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is to begin, meet with judges and assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

CHECK-IN

- A. Participants report to the time and place stated in the conference program and check in:
 - 1. The dragster entry
 - 2. Full-size metric drawing of the completed vehicle
- B. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.
- C. In order to compete, participants must be on the entry list or must have approval of the CRC.
- D. Requirements for attire do NOT apply during check-in, only on the first day of the conference.

- E. Check to see that each entry drawing includes the participant's identification number in the upper right-hand corner of the paper.
- F. Position each entry (dragster and drawing) for evaluation and viewing.
- G. Secure the entries in the designated area.

PRELIMINARY ROUND

- A. At least one (1) hour before the event is scheduled to begin, meet with judges/assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.
- B. Assist judges with evaluation of the design, drawing, and construction categories.
- C. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry

The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- D. Begin the time trials at the scheduled time.
 - 1. Every race-worthy car should be tested.
 - 2. Students do not have to be present.
 - 3. Public viewing is allowed.
- E. Position a judge at the starting gate to ensure that all cars are positioned in the starting gate correctly.
- F. Position another judge at the finish line.
- G. If there is a misfire or if a time is not properly recorded, a rerun may be ordered at the discretion of the event coordinator.
- H. Record preliminary times on a time trial record sheet.
- I. Place each car in the double elimination race bracket (see next page for sample) according to the rank of its qualifying time.
- J. Judges verify that the top sixteen (16) qualifying cars meet specifications.
- K. Entries that do not meet specifications are removed.

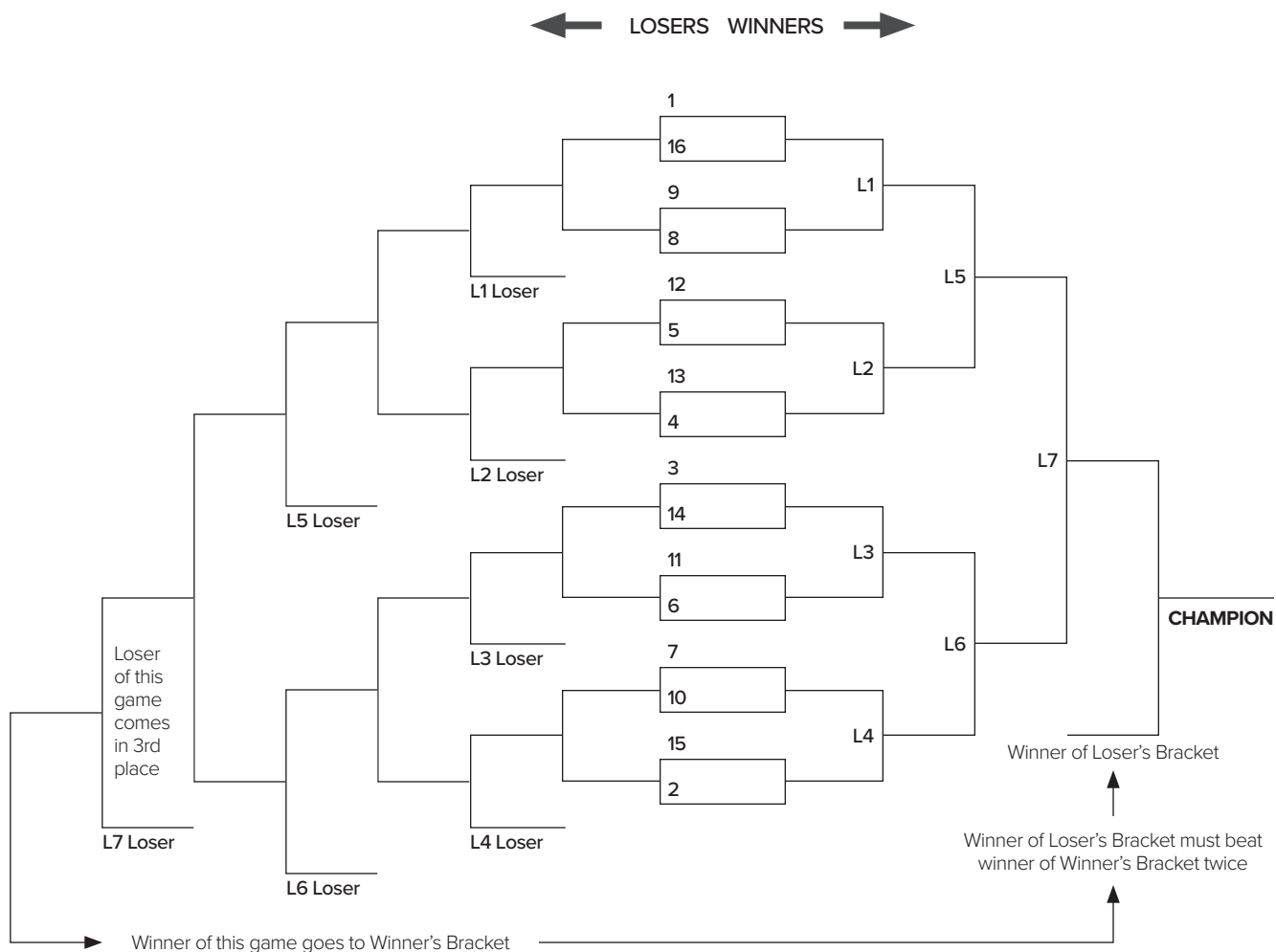
- L. Cars that are damaged or broken during the qualifying round are deemed non-raceable and also are removed.
- M. Only raceable cars, as determined by the judges, are allowed to compete for the semifinalist category.
- N. Lower qualifying cars are moved up until there are sixteen (16) legal semifinalists.
- O. Submit the semifinalist results to the CRC room.

SEMIFINAL ROUND

- A. Post the top sixteen (16) cars with interviews times.
- B. Car builders report to the track at the posted time for a five (5)-minute car builder interview.
- C. Conduct interviews with the qualifying top sixteen (16) car builders.
- D. Begin the semifinals at the scheduled time.
- E. Run the semifinalist race. A sample double-elimination bracket follows.
- F. Only the sixteen (16) qualifying cars are raced.
- G. Students do not have to be present.
- H. Public viewing is allowed.
- I. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- J. Judges use qualifying times to break any ties among the sixteen (16) qualifying cars.
- K. Submit the finalist results and all related forms in the results envelope to the CRC room.
- L. If necessary, manage the security and removal of materials from the event area.

RACE BRACKET FOR 16-CAR DOUBLE ELIMINATION

Double Elimination Tournament Chart Seeded 16 player Field



ELECTRICAL APPLICATIONS



OVERVIEW

Participants take a test of basic electrical and electronic theory to qualify as semifinalists. Applying leadership and 21st century skills, semifinalists assemble a specific circuit from a schematic diagram using their own kit and make required electrical measurements; semifinalists explain their solution during an interview.

ELIGIBILITY

One team of two (2) individuals per chapter may participate. No individuals will be allowed to compete.

TIME LIMITS

PRELIMINARY ROUND

- A. One (1) hour is allotted for the test.

SEMIFINAL ROUND

- A. One (1) hour is allotted to solve the circuit problem.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRELIMINARY ROUND

- A. Participants report to the event area at the time and place stated in the conference program.
- B. Both team members take the test.
- C. The top twelve (12) teams with the highest averaged scores qualify as semifinalists.
- D. A list of semifinalist teams (in random order) is posted.

SEMIFINAL ROUND

- A. Participants report to the event area at the time stated in the conference program.
- B. Participants build a circuit from the provided schematic diagram and make electronic measurements with their multimeter at the designated positions in the circuit, within the time limit, using their own kit.
- C. Judges circulate and perform the evaluations.

- D. Participants remain with their circuit solution until the judges have completed the interview.
- E. Ten (10) finalists are announced during the conference award ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRELIMINARY ROUND

- A. The test may be administered online or via a scan-type answer sheet.
- B. Participants are to bring two (2) sharpened No.2 pencils.

SEMIFINAL ROUND

- A. All work must be completed in the event area during the time specified for the event.
- B. Participants provide:
 - 1. A toolkit with identification (school name, address, and advisor cell phone number). Each tool kit must contain all required materials to fabricate the solution. The following is a suggested list of materials:
 - a. (Minimum) 1.375" x 3.25" solderless circuit breadboard 10 x 30 pin positions
 - b. One (1) 9-volt battery with snap-on battery connector
 - c. One (1) 9-volt battery clip
 - d. One (1) speaker (wires pre-soldered)
 - e. Two (2) LEDs
 - f. Twelve (12) connector wires
 - g. Pushbutton switch (wires pre-soldered)
 - h. One (1) photocell
 - i. One (1) potentiometer
 - j. One (1) IN4003 diode

- k. One (1) IC555 integrated circuit
 - l. One (1) 2N3906 transistor
 - m. One (1) 2N3904 transistor
 - n. Resistors (minimum of one [1] each, ohms): 10, 10K, 47, 100, 220, 1K, 2.2K, 3.3K, 6.8K, 16K, 33K, 120K, 330, 470K
 - o. Capacitors (in microfarads): .01, .1, 10, 100, 1000
 - p. S106B1 SCR
 - q. Wire strippers
 - r. Standard 4-function calculator (scientific calculators will not be permitted)
 - s. Digital multimeter
- C. Paper to complete on-site calculations are provided by TSA.
- D. All other equipment necessary to solve the on-site problem is provided by the coordinator.

EVALUATION

PRELIMINARY ROUND

- A. The averaged team score

SEMIFINAL ROUND

- A. The accuracy and degree of completion of the circuit problem in the allotted time
- B. The interview

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Electrical engineer
- Electrical technician
- Electrician
- Electronic analyst
- Electronic designer
- Research assistant

ELECTRICAL APPLICATIONS

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ Toolkit is present
☐ ENTRY NOT EVALUATED

TEST SCORE (50 points)

TEST SCORE SUBTOTAL (50 points)

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

PRELIMINARY SUBTOTAL (50 points)

SEMIFINAL PROBLEM SOLUTION (80 points)

CRITERIA	Minimal performance	Adequate performance	Exemplary performance	Record scores in the column spaces below.
	1-4 points	5-8 points	9-10 points	
Solution Accuracy (X1)	Solution attempt is evident but the solution is not complete, and/or there is no final solution.	Solution is not complete, though some measurements can be taken.	Solution is accurate and complete.	
Proper Use of Components (X1)	Components are not used properly, and/or they are placed in the wrong sequence.	Components are used correctly, however, they may be placed in the improper sequence.	Components are used correctly and they are in the proper sequence and arrangement.	
Accuracy of Measurements (X1)	Measurements taken and calculated are 0-49% accurate.	Measurements taken and calculated are 50-89% accurate.	Measurements taken and calculated are 90-100% accurate.	
Articulation (X1)	Communication of the solution is unclear, unorganized, and/or illogical; leadership and/or 21 st century skills are not evident.	Communication of the solution is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the solution is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	

SEMIFINAL PROBLEM SOLUTION (80 points) – continued				
Delivery (X1)	Participants are verbose and/or uncertain in the interview; participant's posture, gestures, and lack of eye contact diminish the interview.	Participants are somewhat well spoken and clear in the interview; participant's posture, gestures, and eye contact are acceptable in the interview.	Participants are well-spoken and distinct in the interview; participant's posture, gestures, and eye contact result in a polished, natural, and effective interview.	
Organization (X1)	The team seems unorganized and unprepared for the interview; an illogical explanation of the solution is presented.	The team is generally prepared for the interview; an explanation of the solution is communicated adequately.	The interview is logical and easy to follow; the solution is communicated in an organized and concise manner.	
Knowledge (X2)	The team seems to have little understanding of the necessary concepts; answers to questions may be vague.	The team exhibits understanding of the concepts involved in the solution.	The team shows clear evidence of a thorough understanding of the concepts involved in the solution.	
SEMIFINAL PROBLEM SOLUTION SUBTOTAL (80 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initiated by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
SEMIFINAL SUBTOTAL (80 points)				
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.</p> <p>TOTAL (130 points)</p>				

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

ELECTRICAL APPLICATIONS

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges, semifinal round, two (2) or more
- C. Proctors, two (2) or more
- D. Assistants, two (2)

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
- B. Stick-on labels for identifying entries
- C. Coordinators are responsible for creating the test to be administered at the national conference; copies will be provided by the national TSA office.
- D. Results envelope with coordinator forms
- E. Stopwatch for the assistant/timekeeper
- F. Twelve (12) wire strippers (participants are required to provide their own within the toolkit)
- G. On-site problem:
 - 1. Twelve (12) copies of the on-site circuit diagram problem, one (1) for each team
 - 2. Twelve (12) copies of the calculation worksheet, one (1) for each team
 - 3. Any additional electrical components needed for the on-site problem
- H. Adequate conditions (inside or outside) for on-site testing devices as needed for the designated circuit
- I. Tables and chairs for the participants, event coordinator and judges

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area or room in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is to begin, meet with judges and assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRELIMINARY ROUND

- A. Begin the event at the scheduled time by closing the doors and checking the entry list.
- B. Late participants and/or entries are considered on a case-by-case basis and only when lateness is caused by events beyond the participant's control.
- C. In order to compete, participants must be on the entry list or must have approval of the CRC.
- D. All participants and judges should be in the room at this time.
- E. Manage the one (1)-hour test.
- F. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry

The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.

- G. Judges determine the twelve (12) semifinalists and discuss and break any ties.
- H. Submit semifinalist results and all related forms in the results envelope to the CRC room.

SEMIFINAL ROUND

- A. Participants report at the time and place stated in the conference program for the semifinal challenge.
- B. Provide the on-site circuit problem, any additional electrical components, and the worksheet to the semifinalists.
- C. Manage the one (1)-hour on-site circuit problem.
- D. Judges conduct semifinalist interviews at a location separate from the other semifinalists
- E. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- F. Any ties should be broken on: first, test scores; second, interview points; third, electronic measurement accuracy.
- G. Judges determine the ten (10) finalists and discuss and break any ties.
- H. Submit the finalist results and all related forms in the results envelope to the CRC room.
- I. Manage security and the removal of materials from the event area.

ESSAYS ON TECHNOLOGY



OVERVIEW

Applying leadership and 21st century skills, participants conduct research on specified subtopics of a broader technological area. The topic and subtopics will be posted on the [TSA website](#) under Competitions/Themes and Problems. Participants will apply the knowledge and resources gained through their research to write a comprehensive essay on the one (1) subtopic that is designated on-site.

ELIGIBILITY

Three (3) individuals per state may participate.

TIME LIMITS

PRELIMINARY ROUND

- A. One (1) hour for the on-site detailed outline and corresponding note challenge.

SEMIFINAL ROUND

- A. One (1) hour to complete the on-site essay challenge.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants access the topic and related subtopics on the Themes and Problems of the [TSA website](#).
- B. Participants concentrate their efforts researching the topic and subtopics.
- C. Each participant shall record key points of their research using a 3" x 5" note card for *each* subtopic.
- D. Note cards (1 per subtopic) may be used for the preliminary round of the on-site challenge at the conference.

PRELIMINARY ROUND

Creating a Detailed Outline

- A. Participants report to the event area at the time and place stated in the conference program with their prepared note cards.

- B. One (1) of the subtopics is randomly selected.
- C. Timing begins after the subtopic is announced.
- D. Using the information on the prepared 3" x 5" note cards, participants have one (1) hour to draft the detailed outline.
- E. After one (1) hour the participants turn in a detailed outline and the corresponding note card for independent review by the judges.
- F. A list of twelve (12) semifinalists (in random order) is posted.

SEMIFINAL ROUND

The Essay

- A. Participants report at the time and place stated in the conference program for the on-site essay challenge.
- B. Participants are given one (1) hour to write an essay on the subtopic.
- C. After one (1) hour, each participant turns in an essay not to exceed five (5) pages.
- D. Judges independently review entries.
- E. Ten (10) finalists are announced at the awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRELIMINARY ROUND

- A. Materials:
 - 1. Each participant is required to bring one (1) 3" x 5" note card for each subtopic.
 - a. Participants must *handwrite* notes on one side of the 3" x 5" note cards (one [1] for each subtopic), and the sources and references are to be handwritten on the other side of the note card.
 - b. Note cards are not to contain introductory or concluding paragraphs, nor are details to be written in sentence form.

- c. Participants are not permitted to enter the competition area with computer-generated notes, notes that are not handwritten, or notes not contained on 3" x 5" note cards.
 - d. The outline on the note card may contain a thesis statement.
 - e. The bulleted outline for note cards must follow the required format on the following pages.
2. All research material brought into the event area must be handwritten on the note cards.
 3. Each participant may also bring a hard copy dictionary and/or a thesaurus to the event (no electronic formats permitted).
 4. Participants are responsible for bringing a blue or black ink pen to the event site, which may be "erasable."
 5. Participants may also bring correcting fluid or correction tape to the site.
 6. Each participant is provided with lined paper.
- B. Detailed Outline (to be submitted for judging):
1. Length is limited to two (2) handwritten pages, one (1) side of the paper only, single-spaced.
 2. Each submitted outline page must have the participant entry number only (i.e., no other identifying information) written in the upper right-hand corner of each page.
 3. Participants are required to follow the outline displayed within this event guide.
 4. Requirements must include:
 - a. Introductory paragraph
 - b. Details for a body (of the essay)
 - c. Concluding paragraph
 - d. All details are to be in sentence form.
- C. With the outline, participants must turn in a one (1) page bibliography (written on one [1] side of the paper only, using proper MLA bibliography format), and the relevant note card.
- D. The relevant note card is to have the participant entry number written in the upper right-hand corner.

- E. Only participants are allowed in the event area.
- F. Should a participant finish before the allotted time expires, the participant is allowed to leave quietly but may not re-enter the event room.
- G. Twelve (12) semifinalists are determined; semifinalists write an essay on a subtopic.

SEMIFINAL ROUND

- A. Participants are allowed to bring correcting fluid or correction tape, and a hard-copy dictionary and/or thesaurus to the event (no electronic formats are permitted).
- B. Participants are responsible for bringing a blue or black ink pen to the event site. The pen may be "erasable."
- C. Each participant receives his/her outline, bibliography, and note card submitted from the preliminary round.
- D. Each essay must have the participant's entry number only written in the upper right-hand corner of each page submitted.
- E. The essay must be no more than five (5) pages, written on one (1) side of the paper only, and double-spaced. The list of references (bibliography) is not included in the five (5) pages.
- F. With the essay, participants must turn in:
 1. A one (1)-page bibliography (written on one [1] side of the paper only, using proper MLA bibliography format)
 2. The outline from the preliminary round
 3. The relevant note card
- G. All essays, outlines, and note cards become the property of national TSA.

EVALUATION

PRELIMINARY ROUND

- A. The outline

SEMIFINAL ROUND

- A. The essay

Refer to the official rating form for more information.

NOTE

When conducting research, participants should consider source credibility and be aware that some web-based resources may have misleading, misrepresentative, or inaccurate information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Economist
- Engineer
- Research technician
- Scientist
- Technical writer

OUTLINE FORMAT FOR NOTE CARDS

TITLE OF ESSAY

A. INTRODUCTION

1. Thesis statement (may be written in sentence form)

B. BODY

1. Point A
 - a. Supporting detail
 - b. Supporting detail
2. Point B
 - a. Supporting detail
 - b. Supporting detail
3. Point C
 - a. Supporting detail
 - b. Supporting detail

C. CONCLUSION

DETAILED OUTLINE FORMAT PRELIMINARY ROUND

TITLE OF ESSAY

A. INTRODUCTORY PARAGRAPH

B. BODY

1.
 - a.
 - i.
 - ii.
 - b.
 - i.
 - ii.
2.
 - a.
 - i.
 - ii.
 - b.
 - i.
 - ii.
3.
 - a.
 - i.
 - ii.
 - b.
 - i.
 - ii.

C. CONCLUDING PARAGRAPH

ESSAYS ON TECHNOLOGY

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ Note cards are present and contain appropriate bulleted outlines
- ☐ Bibliography is present
- ☐ ENTRY NOT EVALUATED

DETAILED OUTLINE (80 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Format (X1)	Outline only minimally follows the required format.	Outline generally follows the format, with most items from the format included.	Outline clearly follows the format; elements are in the proper sequence, and all items are included.	
Thesis (X1)	Thesis is not a complete thought and/or is inappropriate for the essay; essay title and thesis do not correlate with one another; thesis lacks creativity.	Thesis is evident, and the idea behind the thesis is generally clear, concise, and/or creative; essay title correlates with the thesis.	Thesis is well structured, concise, and creative; essay title correlates well with thesis.	
Introduction (X1)	Introduction lacks detail; thesis does not help to establish the writer's position.	Introduction creates some interest; thesis clearly states the writer's position.	Introduction is well developed; the thesis clearly states a significant and compelling position.	
Body of Essay (X1)	Outline of paragraphs lacks main points to support the thesis, and/or there is a poor development of ideas.	Outline of paragraphs includes main points that are related to the thesis; examples have adequate supporting details.	Outline of paragraphs provides well-developed main points directly related to the thesis; supporting examples are concrete and detailed.	
Conclusion (X1)	Conclusion is recognizable, but it does not effectively summarize the topic.	Conclusion effectively summarizes the points of the topic.	Conclusion clearly wraps up the points of the topic and goes beyond restating the thesis.	
Organization (X1)	No discernible organization is apparent.	There is a logical progression of ideas in the outline; some structure is evident.	The outline conveys a logical progression of ideas, with a clear structure that enhances the thesis.	
Mechanics (X1)	Outline contains distracting errors in punctuation, grammar, and spelling; handwriting is messy and/or illegible.	Punctuation, spelling, and grammar are generally correct, with few errors; handwriting is adequate and/or mostly legible.	Punctuation, spelling, and grammar are correct, with no errors; handwriting is easy to read.	
Bibliography (X1)	References are not used effectively and/or do not pertain to the topic; limited quality sources are used; bibliography is not in the proper MLA format.	Most sources used are credible and of good quality; most references help to support the essay topic; bibliography is in the proper MLA format, with only minor errors.	Outline includes multiple and varied sources, all of which are credible, appropriate, and support the topic; bibliography is in proper MLA format, with no errors.	

DETAILED OUTLINE SUBTOTAL (80 points)

Rules violations (a deduction of 20% of the total possible points in the semifinalist section) must be initialed by the evaluator, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

PRELIMINARY SUBTOTAL (80 points)

ESSAY (90 points)

CRITERIA	Minimal performance	Adequate performance	Exemplary performance	Record scores in the column spaces below.
	1-4 points	5-8 points	9-10 points	
Thesis (X1)	Thesis is not a complete thought and/or is inappropriate for the essay; essay title and thesis do not correlate with one another; thesis lacks creativity.	Thesis is evident, but the idea behind the thesis may not be clear or concise, and/or it may be lacking in creativity; essay title somewhat correlates with the thesis.	Thesis is well structured, concise, appropriate, and creative; essay title correlates well with thesis.	
Introductory Paragraph (X1)	Introduction provides background but may lack detail; thesis does not help to establish the writer's position.	Introduction creates interest; thesis clearly states the position.	Introduction is well developed, it engages the reader, and it creates interest; the thesis clearly states a significant and compelling position.	
Body Paragraphs (X1)	Paragraphs lack main points to support the thesis, and/or there is a poor development of ideas.	Paragraphs include main points that are related to the thesis; supporting details are adequate.	Paragraphs provide well-developed main points directly related to the thesis; supporting examples are concrete and detailed.	
Concluding Paragraph (X1)	Conclusion is recognizable, but it does not effectively summarize the topic.	Conclusion effectively summarizes the topic.	Conclusion wraps up the points of the essay and goes beyond restating the thesis.	
Organization (X1)	No discernible organization is apparent; transitions are not present.	There is a logical progression of ideas in the essay; transitions are present throughout the essay.	The essay conveys a logical progression of ideas, with a clear structure that enhances the thesis; transitions are mature and graceful.	
Style (X1)	The style is confusing and hard to follow; it contains fragments and/or run-on sentences; word choice is simple, ordinary, and/or repetitive.	The style is generally clear, but sentences may lack variety; word choice is appropriate.	The style is smooth, skillful and coherent; sentences are strong and expressive, with varied structure; word choice is appropriate and mature.	
Mechanics (X1)	Essay contains distracting errors in punctuation, grammar, and spelling; handwriting is messy and/or illegible.	Punctuation, spelling, and grammar are generally correct, with few errors; handwriting is generally legible.	Punctuation, spelling, and grammar are correct, with no errors; handwriting is easy to read.	
Research Base (X1)	Essay lacks an adequate research base, and/or very few credible sources are referenced; leadership and/or 21 st century skills are not evident.	Research is conducted appropriately, with generally credible sources; leadership and/or 21 st century skills are somewhat evident.	Essay conveys a comprehensive research base that includes clearly credible sources; leadership and/or 21 st century skills are clearly evident.	
Bibliography (X1)	References are not used effectively and/or do not pertain to the topic; limited quality sources are used; bibliography is not in the proper MLA format.	Most sources used are credible and of good quality; most references help to support the essay topic; bibliography is in the proper MLA format, with only minor errors.	Essay incorporates multiple and varied sources, all of which are credible, appropriate, and support the topic; bibliography is in proper MLA format, with no errors.	

ESSAY SUBTOTAL (90 points)

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

SEMIFINAL SUBTOTAL (90 points)

To arrive at the **TOTAL** score, subtract rules violation points, as necessary.

TOTAL SCORE (90 points)

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

ESSAYS ON TECHNOLOGY

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) for every twenty (20) outlines submitted
 - 2. Semifinal round, two (2) or more

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stopwatch
 - 5. Results envelope with coordinator forms
 - 6. Stick on labels, for entries
- B. Securable room (preferable) during time of the event
- C. Lined paper, five (5) sheets per participant in the preliminary round; ten (10) sheets per each participant in the semifinal round
- D. Subtopics, one (1), which is chosen on-site as the essay topic
- E. Paper clips and staplers for securing note cards, outlines, and essays
- F. Tables and chairs for event coordinator, judges, and participants

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area or room in which the event is being held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.

- E. At least one (1) hour before the event is to begin, meet with judges and assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRELIMINARY ROUND

- A. Begin the event at the scheduled time by closing the doors and checking the entry list.
- B. Late entries are considered on a case-by-case basis and only when the lateness is caused by circumstances beyond the participant's control.
- C. In order to compete, participants must be on the entry list or must have approval of the CRC.
- D. All participants should be in the room at this time. Participants registered but not present may be disqualified.
- E. Distribute five (5) sheets of ruled notebook paper to each participant. Provide additional paper as needed.
- F. Instruct participants to identify their outline with only their entry number written in the upper right hand corner of each page submitted. No other identifying information may be included.
- G. Remind participants to single-space their outline and submit no more than two (2) pages for evaluation, plus a single page for references, and the note card used for research (each with their entry number in the upper right hand corner).
- H. Randomly select one (1) of the subtopics. This subtopic becomes the subject for all the entries.
- I. Instruct participants who finish before time is called that they may submit their work and leave quietly.
- J. Five (5) minutes before the hour is up, make an announcement that the participants have five (5) minutes to complete their outline.
- K. Exactly one (1) hour after beginning, call time and collect the outlines, reference pages, note cards, and unused paper.
- L. Supervise and assist the judges during the evaluation of the outlines and note cards.

- M. Each entry must be read independently by two (2) judges.
- N. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry
 The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- O. The two (2) scores for each entry are averaged and the top twelve (12) semifinalists are posted in random order.
- P. Submit the semifinalist results to the CRC room.
- Q. If necessary, manage security and the removal of materials from the area.
- K. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- L. Judges determine the ten (10) finalists and discuss and break any ties.
- M. Submit the finalist results and all related forms in the results envelope to the CRC room.
- N. If necessary, manage security and the removal of materials from the area.

SEMIFINAL ROUND

- A. Distribute participant's outlines and note cards from the preliminary round as participants check in to the semifinal round.
- B. Distribute ten (10) sheets of ruled notebook paper to each participant. Provide additional paper as needed.
- C. Instruct participants to identify their essay with only their entry number written in the upper right hand corner of each page of the essay submitted. No other identifying information may be included.
- D. Remind participants to double space their written work and submit no more than five (5) essay pages, plus a single page for references (with their entry number in the upper right hand corner).
- E. Each participant is required to turn in the outline and the note card used for the preliminary round.
- F. Instruct participants who finish before time is called that they may submit their work and leave quietly.
- G. Five (5) minutes before the hour is up, make an announcement that the participants have five (5) minutes to complete their essay.
- H. Exactly one (1) hour after beginning, call time and collect the essays, reference pages, outlines, note cards, and unused paper.
- I. Supervise and assist the judges during the reading of the essays.
- J. Each entry must be assessed twice.

OVERVIEW

Applying leadership and 21st century skills, participants study the principles of flight and design in order to fabricate a glider that stays in flight for the greatest elapsed time. The glider must be designed to be launched from a catapult that is provided on-site. The design process is documented in a portfolio that is submitted for evaluation.

ELIGIBILITY

Two (2) individuals per chapter may participate.

TIME LIMITS

PRELIMINARY ROUND

- A. Participants test their prebuilt glider for three (3) flights with no additional trim time.

SEMIFINAL ROUND

- A. Forty-five (45) minutes are allowed for the construction of a glider.
- B. Fifteen (15) minutes are allowed for trimming (test flights) of their glider.

ATTIRE

TSA competition attire is required.

SAFETY

- A. Participants are required to provide and wear safety-approved eyewear during all phases of this event.
- B. Prescription eye wear needs to have side shields to be considered safety eyewear.
- C. Should a participant remove his/her eyewear during the event, he/she will be reminded once to replace it. If there is a second infraction, the participant will be disqualified and asked to leave the competition.
- D. TSA will not supply safety glasses.
- E. Participants must be instructed by their advisors on the proper use of cyanoacrylate (CA) glue.

PROCEDURE

PRELIMINARY ROUND

On-site Testing of Pre-Built and Trimmed Gliders

- A. Participants report to the time and place stated in the conference program:
 - 1. The completed glider
 - 2. The documentation portfolio
 - 3. Safety glasses
- B. On-site Testing:
 - 1. During the testing participants must provide and wear safety glasses.
 - 2. No trim time is allotted during the preliminary round.
 - 3. After check-in, participants will test their prebuilt glider for three (3) flights.
- C. Scoring: After the third flight, the three (3) flight times are averaged to obtain the average flight time; If a plane is unable to be tested the time is marked as a zero (0).
- D. Twenty (20) semifinalists are determined by the top twenty (20) averaged test flight times.
- E. Participants pick up their entries at the time and place stated in the conference program.

SEMIFINAL ROUND

On-site Reconstruction of Glider and Flight Testing

- A. Twenty (20) semifinalist teams report to the event area at the time and place stated in the conference program to demonstrate the leadership and/or 21st century skills acquired by participating in an on-site reconstruction of the glider.
- B. Participants provide their own toolbox and building materials for the on-site construction portion (see regulations).
- C. Participants must provide and wear safety glasses.
- D. Participants use their metric technical drawing to fabricate a glider.

- E. Participants have 30 minutes to trim their glider in the designated area.
- F. Documentation portfolios are evaluated.
- G. Participants are allowed three (3) opportunities to fly their gliders for official times.
- H. Launch Procedures:
 - 1. Participants are called by their group timer to the designated launch area.
 - a. Each participant receives a turn to fly his/her glider.
 - b. Participants must do all four (4) flights consecutively during their turn.
 - c. The glider is hooked to the rubber loop of the catapult provided by TSA, and the participant pulls the glider's shark tooth point back to the wooden stop in front of the 350mm stop block or less on the catapult. The altitude and angle of the catapult (with the glider on it) are determined by participants as the glider is launched.
 - d. The participant releases the glider after getting the OK from the official timer.
 - 2. Flight time begins when the glider is released.
 - 3. Flight time ends when the glider hits the floor or ground, or when it comes to rest on an obstruction.
 - 4. One repair is allowed after the individual time trials have begun.
 - a. The repair must be made in three (3) minutes or less.
 - b. No additional trimming is allowed after the repair.
- I. The combined flight time of the best three (3) of the four (4) flights is used to determine the ten (10) finalists.
- J. Ties are broken by determining the longest single flight time.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRE-CONFERENCE

- A. Documentation Portfolio:
 - 1. Documentation materials (comprising "a portfolio") are required and must be secured in a [clear front report cover](#) with the following single-sided, 8½" x 11" pages, in this order:
 - a. Title page with event title conference city and state, the current year, and the participant's ID number
 - b. Full-size metric technical drawing of the glider including dimensions on an 11" x 17" paper, which may be folded to fit into the sheet protector. The technical drawing must:
 - i. Be created using CAD, or be hand-drawn with traditional mechanical drawing instruments
 - ii. NOT be a freehand sketch
 - iii. Depict all parts that make up the glider
 - iv. Be drawn to full scale
 - v. Be drawn on a single sheet of paper that does not exceed 11" x 17"
 - vi. Participants are not allowed to enter the semifinal on-site glider construction round without a completed technical drawing included.
 - c. Pictures of two (2) test gliders are included in the portfolio (one [1] picture of each test glider, for a total of two [2] pictures).
 - d. A flight log for each pictured test glider (see Flight Log sample) must be included.

- e. A detailed drawing demonstrating compliance with the rules and features, including design principles used in building and adjusting gliders, must be included on 11" x 17" paper (may be folded to fit in the sheet protector).
 - f. A technical review of one flight log detailing launch, trim, and flights of the glider must be included.
- B. For pre-built glider and home-testing catapult regulations and specifications, refer to the "Glider Reconstruction Materials" section in the semifinal round of this guide.

PRELIMINARY ROUND

The Flight Test

- A. Participants are required to provide and wear safety eyewear for this event.
- B. Catapults for timed flights at the national event site are supplied by TSA.
- C. During time trial flights, ONLY catapults provided by TSA may be used.
- D. No trim time is allotted.

SEMIFINAL ROUND

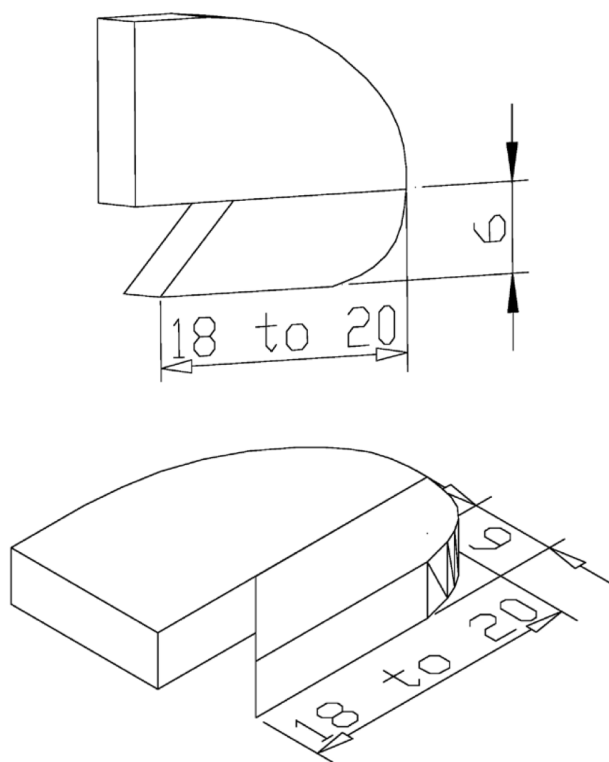
Reconstruction of the Glider

- A. Participants demonstrate their expertise by reconstructing the glider.
- B. Participants are required to provide their own tool box for use in the semifinal on-site construction challenge. Participants should bring only the tools needed and leave the rest behind. Transporting and checking in will be made simpler with a smaller and lighter tool box.
 - 1. Each tool box must:
 - a. Include identification (school name, address, and advisor cell phone number)
 - b. Not exceed twenty (20) inches (508 mm) length x ten (10) inches (254 mm) width x ten (10) inches (254 mm) height
 - c. Contain all items needed to fabricate the solution
 - d. Participants are not permitted to share toolboxes

- e. The following is a suggested list of tools:
 - i. Cutting devices – none may be electric
 - ii. Adhesives – This event requires the use of cyanoacrylate glue (best known as Super/Krazy glue) instead of aliphatic resin glue. Participants should practice with this material before the conference.
 - iii. Aerosol and electric applicators are not allowed
 - iv. A bottle of Uncure or Debonder is recommended
 - v. A single two (2)-ounce bottle of accelerant (pump or drip) is permitted
 - vi. Temporary fastening devices
 - vii. Straight pins
 - viii. Clamps
 - ix. Tape
 - x. A cutting surface that prevents table-top marring (required)
 - xi. Rulers, straightedges, and/or measuring scales
 - xii. Abrasives sheets, sponges, boards
 - xiii. Marking devices (pens, pencils, etc.) and sharpener
 - xiv. Sheet of wax paper, as large as is needed for the competition (required)
- 2. Glider reconstruction materials (supplied by the participant)
 - a. Participants are not permitted to share.
 - b. Moldable ballast material, i.e., clay
 - c. Only basswood may be used to create the glider.
 - i. Templates, jigs, and fixtures MAY be used in constructing gliders (these are to help facilitate fast and accurate construction), however, these templates, jigs, and fixtures must be developed and built by students, and must not be bass wood or balsa wood to eliminate confusion with pre-made parts.

BLANKS	Length	Width	Thickness
Fuselage	MAX 300mm or 11 $\frac{7}{8}$ "	MIN 13mm or $\frac{1}{2}$ "	MIN 3mm or $\frac{1}{8}$ "
Wing	MAX 300mm or 11 $\frac{7}{8}$ "	MAX 76mm or 3"	MIN 1.5mm or $\frac{1}{16}$ "
Stabilizer	MAX 150mm or 5 $\frac{7}{8}$ "	MAX 50mm or 2"	MIN .75mm or $\frac{1}{32}$ "
Fin	MAX 76mm or 3"	MAX 25mm or 1"	MIN .75mm or $\frac{1}{32}$ "
Shark Tooth	MAX 20mm or $\frac{3}{4}$ "	MAX 6mm or $\frac{1}{4}$ "	MIN 3mm or $\frac{1}{8}$ "

FINISHED GLIDER SIZE	Length	Width	Notes
Fuselage Measured without ballast (clay, etc)	MAX 300 mm or 11 $\frac{7}{8}$ "		No extra length allowed for grip
Wing Span	MAX 300 mm or 11 $\frac{7}{8}$ "		
Wing Chord		MAX 76mm or 3"	Measured parallel to fuselage at widest point



ii. No precut pieces is allowed.

iii. Wood blank specifications:

1. Only one (1) piece is allowed for each glider part listed. Choose wood carefully.
2. The following table describes the wood blanks allowed. A blank is the starting size of material before cutting or sanding.

3. Catapult specifications (to be used for trim and testing at home, school, and during preparation prior to time trial flights):

- a. Catapults for timed flights at the national event site are supplied by TSA.
- b. During time trial flights, ONLY catapults provided by TSA may be used.
- c. Catapults are made from hardwood or plywood.
- d. Participants who prefer to do so may use their own catapults during trim flights.

- e. Catapult wooden stick dimensions:
 - i. Laminate a piece of wood (10mm thick x 45mm wide x 700mm long) to a second piece of wood (6mm thick x 45mm wide x 350mm long), aligning the pieces at the handle end and gluing them face-to-face (see drawing).
 - ii. The handle is 20mm thick x 30mm wide x 150mm long and is attached by screws to a 15mm thick x 30mm wide x 75mm long block using a middle-lap joint. The 75mm long block then is screwed to the laminated main catapult stick beginning at 400mm from the muzzle end.
 - iii. The rubber loop is a #19 rubber band $3\frac{1}{2}$ " x $\frac{1}{16}$ " threaded through the screw eye of the launcher. Rubber bands are available in bulk from office suppliers such as Office Max, Office Depot, and Staples.
 - iv. The screw eye is attached to the center of the 15mm thick x 15mm wide x 45mm long wooden block connected to the underside of the muzzle end of the catapult.
4. Storage container—All student-made items and fixtures must fit in the toolbox, which is not to exceed 254mm high x 254mm wide x 508mm long.
5. Student made fixtures may include:
 - a. Traction plate with sandpaper (150mm x 300mm maximum) attached to a thin piece of rigid material, i.e., plywood, foam core board, press board, cardboard, plastic, etc.
 - b. Dihedral fixture—This is an all-wood apparatus that assists in sanding the critical dihedral joints and secures the model as the glue dries to ensure a precise prototype.

EVALUATION

- A. The documentation portfolio
- B. Points earned for the accumulated flying time of three (3) trials

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

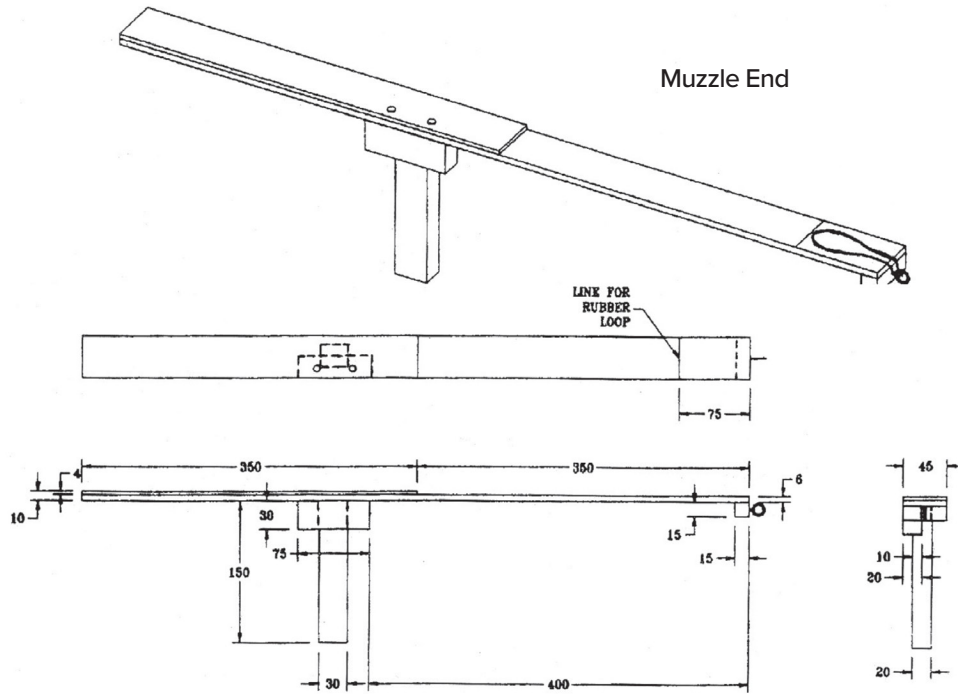
- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Aeronautical engineer
- Aircraft systems engineer
- Physics instructor

CATAPULT DRAWING



FLIGHT LOG SAMPLE

Glider #1 or Glider #2 (circle one)			Dates:	
Flight #	Time aloft	Flight pattern	Trim adjustment	Advisor sign off
#1				
#2				
#3				
#4				
#5				
#6				
#7				
#8				
#9				
#10				

FLIGHT

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ Glider is present
- ☐ Building material including toolkit are present
- ☐ Documentation portfolio is present
- ☐ ENTRY NOT EVALUATED

DOCUMENTATION PORTFOLIO (70 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Portfolio (X1)	Portfolio is unorganized and/or missing three or more components.	Portfolio may be missing up to two components; it is mostly organized.	All components are included in the portfolio, and content and organization are clearly evident.	
Full Scale Technical Drawing (X1)	Technical drawing is missing two or more components; parts of the glider are not shown; non-metric dimensioning is used; technical drawing is not drawn to full scale and/or is on paper larger than 11" x 17", and/or it is sloppy.	Technical drawing may be missing one component; the technical drawing is largely correct and neatly completed.	All components are included in the technical drawing and the drawing is correctly and neatly completed.	
Technical Drawing/Built Glider Correlation (X1)	Glider built for the competition does not match the technical drawing in dimensions or appearance; glider is not designed/built properly for the event.	Glider is similar to the technical drawing within a tolerance of 5mm; glider is designed correctly to fly in the competition.	Glider is within a tolerance of 2mm of the technical drawing; glider is constructed exactly as the technical drawing illustrates.	
Test Glider Pictures (X1)	One test glider photo is missing, and/or pictures are not clearly visible, and/or they lack definition/detail of each glider.	Pictures of both test gliders are included; each picture is clearly visible, but pictures provide only adequate definition and/or detail.	Both test glider pictures include significant details and annotations about each glider; clearly visible pictures are defined.	
Flight Logs (X1)	One flight log is missing, and/or the logs are incomplete, and/or advisor signature is not included.	Both logs are included and they are generally complete.	Both logs are included and are complete, with a thorough understanding of a flight log's purpose as a flight aid.	
Detail Drawing (X1)	Detail drawing is unclear, non-compliant with the regulations and design feature specifications; adjustments are not addressed or are missing.	Detail drawing illustrates compliance with most rules and design features used in building; adequate details for adjustments are provided.	Detail drawing illustrates compliance with all rules and design features used in building and adjusting the glider.	
Technical Review of Flight Log (X1)	Review of flight logs are missing many details of launching; trimming and flying of one glider are not clear; leadership and/or 21 st century skills are not evident.	Review of Flight Logs provide adequate details of launching, trimming and flying of one glider; leadership and/or 21 st century skills are somewhat evident.	Review of Flight Logs are complete, with a thorough understanding of launching, trimming and flying of one glider; leadership and/or 21 st century skills are clearly evident.	
DOCUMENTATION PORTFOLIO SUBTOTAL (70 points)				

FLIGHT

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

PRELIMINARY SUBTOTAL (70 points)

FLIGHT TIMES (70 points)

Flight times recorded to the nearest one hundredth [.01] of a second.

Duration of flight #1		Seconds		Duration of flight #3		Seconds	
Duration of flight #2		Seconds		Duration of flight #4		Seconds	
1st	2nd	3rd	4th	5th	5th	7th	8th
70 Points	67 Points	64 Points	61 Points	58 Points	55 Points	52 Points	49 Points
9th	10th	11th & 12th	13th & 14th	15th & 16th	17th & 18th	19th – 20th	
46 Points	43 Points	36 Points	30 Points	24 Points	18 Points	12 Points	

SUBTOTAL FLIGHT SCORE (70 points)

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

SEMIFINAL SUBTOTAL (140 points)

To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.

TOTAL (140 points)

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

FLIGHT

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more
- C. Assistants, two (2) or more
- D. Timekeepers, two (2) or more

MATERIALS

- A. Coordinator's packet, containing
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge/assistant
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stopwatches, two (2) or more
 - 5. Results envelope with coordinator forms
- B. Other supplies
 - 1. Measuring scales
 - 2. First aid kit with strip bandages and debonder
 - 3. Catapults, five (5)
 - 4. #19 rubber bands
- C. Metric rulers

SAFETY

- A. Participants are required to provide and wear safety-approved eyewear during all phases of this event.
- B. Prescription eye wear needs to have side shields to be considered safety eyewear.
- C. Should a participant remove his/her eyewear during the event, s/he will be reminded once to replace it. If there is a second infraction, the participant will be disqualified and asked to leave the competition.
- D. TSA will not supply safety glasses.
- E. Participants must be instructed by their advisors on the proper use of cyanoacrylate (CA) glue.

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is to begin, meet with judges and assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRELIMINARY ROUND

- A. Check in participants at the time stated in the conference program.
- B. Participants check in:
 - 1. The completed glider
 - 2. The documentation portfolio
 - 3. Safety glasses
- C. Late participants and/or entries are considered on a case-by-case basis and only when lateness is caused by events beyond the participant's control.
- D. In order to compete, participants must be on the entry list or must have approval of the CRC.
- E. Distribute the list of entrants assigned to each designated judge/timer.
- F. Timed flight procedure:
 - 1. Each flight time is recorded to the nearest one hundredth (.01) of a second.
 - 2. After the fourth flight, the top three (3) flight times are added together, then divided by three (3) to obtain the average flight score; each glider is placed with its documentation portfolio.

3. Three (3) groups may fly simultaneously in the assigned area for the event, with consideration for the safety of gliders and participants.
 4. Each participant receives a new rubber band for each of the test flights.
- G. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
1. To deduct twenty percent (20%) of the total possible points in this round
 2. To disqualify the entry
- The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- H. After the test flight, average the scores and determine finalists.
- I. After the gliders have been tested, secure the holding area so that the gliders and documentation portfolios remain safe until the scheduled time for pickup.

SEMIFINAL ROUND

- A. Check in semifinalists at the time stated in the conference program.
- B. Check to verify that the tool-boxes and building materials are within the specifications outlined.
- C. Announce any specific rules and regulations pertaining to the on-site construction challenge.
- D. Manage the on-site construction of gliders.
- E. After the gliders have been constructed, secure the holding area so that the gliders and documentation portfolios remain safe until the scheduled time for trimming.
- F. Designate times for test flying/trimming and communicate the thirty (30)-minute segments scheduled for each group of participants.
- G. Designate times for groups to make four (4) official flights for time.
- H. Timed flight procedure:
 1. Each flight time is recorded to the nearest one hundredth (.01) of a second.
 2. After the fourth flight, the top three (3) flight times are averaged to obtain a score; each glider is placed with its documentation portfolio.
- I. Judges determine the ten (10) finalists and discuss and break any ties.
- J. Submit the finalist results and all related forms in the results envelope to the CRC room.
- K. Manage the security and removal of materials from the area.
- L. Documentation portfolios are judged.
- M. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- N. Judges determine the ten (10) semifinalists and discuss and break any ties.
- O. Submit the finalist results and all related forms in the results envelope to the CRC room.
- P. If necessary, manage security and the removal of materials from the event area.

OVERVIEW

Participants take a test of basic forensic science theory to qualify as semifinalists. Applying leadership and 21st century skills, semifinalists demonstrate expertise of forensic science concepts through the application of techniques within a limited time frame. Each year, three (3) skills or techniques will be posted in under the Themes and Problems page on the [TSA website](#). Students will need to be familiar with and able to demonstrate all three (3) skills. During the semifinalist portion, one (1) skill will be selected for the students to demonstrate to the judges.

ELIGIBILITY

One (1) team of two (2) individuals per chapter may participate.

TIME LIMITS

PRELIMINARY ROUND

- A. One (1) hour to complete the test.

SEMIFINAL ROUND

- A. Five (5) minutes is allowed to set up supplies and prepare the demonstration. Supplies are provided but students may bring their own if they prefer.
- B. Ten (10) minutes is allowed to demonstrate their selected skill and answer questions from the judges.
- C. Three (3) minutes is allowed to clean the demonstration area.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRELIMINARY ROUND

- A. Participants report for the test at the time and place stated in the conference program.
- B. A forensic science test is administered to all team members at the same time.
- C. Twelve (12) teams with the highest averaged scores are selected as semifinalists for the on-site problem.
- D. A list of semifinalists in random order is posted.

SEMIFINAL ROUND

- A. Participants report at the time and place stated in the conference program to sign-up for the on-site skills challenge.
- B. Participants report at the assigned time and place for the on-site skills challenge.
- C. Each team is given a copy of the skill they are required to demonstrate.
 - 1. Participants use the allotted time to set up necessary materials and prepare the demonstration.
 - 2. Participants demonstrate the selected skill in the application of using proper forensic science techniques, and to respond to questions.
 - 3. Participants clean the demonstration area and pack necessary supplies for the next competitors.
- D. The top ten (10) finalists are announced during the conference award ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRELIMINARY ROUND

- A. Tests may be administered online or via a scan-type answer sheet. Please review the Competition Updates page of the [TSA website](#).
- B. Team members take the test individually.
- C. Participants are responsible for bringing two (2) sharpened No.2 pencils to the test site.
- D. The same two (2) team members compete in the semifinal round, should the team qualify.

SEMIFINAL ROUND

- A. No reference may be made concerning the name of the team, the team members, or their school. Team members write their team identification number on any material used to demonstrate their skill.

- B. No reference materials may be used during this event.
- C. No observers are allowed in the event or preparation rooms during the event.
- D. Supplies are provided to complete the demonstration, however, students may bring their own supplies.
- E. If teams supply their own materials they are only allowed to use the same type of materials provided by National TSA. For example, if the skill the students are demonstrating is “Taking and Lifting Fingerprints,” students may bring their own dusting powder and duster, but would not be permitted to use a camera with micro capabilities unless it is provided by National TSA.

Optional tools:

1. Clipboard(s)
2. Blank sheets of paper (for note taking)

EVALUATION

PRELIMINARY ROUND

- A. The averaged team’s test score

SEMIFINAL ROUND

- A. The demonstration/interview

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Crime scene investigator
- Forensic anthropologist
- Forensic pathologist
- Forensic engineering scientist

FORENSIC TECHNOLOGY

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

☐ ENTRY NOT EVALUATED

TEST SCORES (50 points)

Record the test scores of each of the two (2) team members (for team A and B) in the boxes below and then calculate the team average. Record the team average in the column space to the right.

Team member 1		Team member 2		
TEST SUBTOTAL (50 points)				

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

PRELIMINARY SUBTOTAL (50 points)

SKILLS DEMONSTRATION (80 points)

CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Knowledge (X2)	The team is unprepared and unorganized for the presentation.	Team members have a general understanding of the forensic science skill and answer questions adequately.	There is clear evidence that team members have a thorough understanding of the forensic science skill; they answer questions well and confidently.	
Articulation (X1)	The team's demonstration is not logical or articulate; leadership and/or 21 st century skills are not evident.	The team's demonstration is logical and generally articulate; leadership and/or 21 st century skills are somewhat evident.	The team provides a concise, logical, and clear explanation of the skill they are demonstrating; leadership and/or 21 st century skills are clearly evident.	

Record scores in the column spaces below.

SKILLS DEMONSTRATION (80 points) – continued			
Team Participation (X1)	Only one team member communicates with judges; there is no participation from the other team members.	Team members participate equally, but only one member seems to fully understand the concepts.	Team members seem to fully understand the concepts and share an equal role in the demonstration.
Skill Demonstration (X2)	Team members are unable to successfully demonstrate the designated skill.	Team members are able to partially demonstrate the designated skill.	Team members are successful and effective in their skill demonstration.
Technique (X2)	No indication of proper technique is used during the demonstration	Some indication of proper technique is used during demonstration.	Proper technique is used during the demonstration.
SKILLS DEMONSTRATION SUBTOTAL (80 points)			
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>			
SEMIFINAL SUBTOTAL (80 points)			
To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.			TOTAL (130 points)

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

FORENSIC TECHNOLOGY

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more
- C. Timekeepers for recording start/stop times
- D. Monitors, one (1) per event room

MATERIALS

- A. Coordinator's packet containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Results envelope with coordinator forms
- B. Coordinators are responsible for creating the test to be administered at the national conference; copies are provided by the national TSA office.
- C. Stopwatches for timekeepers, one (1) per room
- D. Tables and chairs in the analysis room
- E. Copies of the semifinalist problem, one (1) per team and one (1) per judge
- F. Supplies needed to demonstrate the selected skill

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is being held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.

- E. At least one (1) hour before the event is to begin, meet with judges and assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRELIMINARY ROUND

- A. Begin the event at the scheduled time by closing the doors and checking the entry list.
- B. Late participants and/or entries are considered on a case-by-case basis and only when lateness is caused by events beyond the participant's control.
- C. In order to compete, participants must be on the entry list or must have approval of the CRC.
- D. All participants and judges should be in the room at this time.
- E. In order to compete, participants must be on the registration list or must have approval of the CRC.
- F. Monitor the one (1)-hour test.
- G. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry
 The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- H. Judges determine the twelve (12) semifinalists.
- I. Submit semifinalist results to the CRC for posting.
- J. The demonstration theme is posted when the semifinalists are posted.

SEMIFINAL ROUND

- A. Set up the demonstration supplies in the designated room one (1) hour prior to the semifinalist sign-up time.
- B. Facilitate semifinalist sign-up times at the designated location.
- C. When each team enters the crime scene room, guide them to the demonstration area.

- D. Notify students when time begins. Allow teams five (5) minutes to set up and prepare for the demonstration.
- E. Allow ten (10) minutes for the students to demonstrate the selected skill.
- F. At the end of the ten (10)-minute period, allow students two (2) minutes to clean up the work space and then escort the students out of the competition room.
- G. Collect all materials, including any notes, prior to dismissing the participants.
- H. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- I. Judges determine the ten (10) finalists and discuss and break any ties.
- J. Submit the finalist results and all related forms in the results envelope to the CRC room.
- K. Manage security and removal of all materials from the competition area.

FOUNDATIONS OF INFORMATION TECHNOLOGY (FIT)



OVERVIEW

Participants complete an examination covering essential IT skills and knowledge needed to execute tasks commonly performed by all levels of IT professionals alike. Areas include but not limited to: using features and functions of common operating systems and establishing network connectivity, identifying common software applications and their purpose, and using security and web browsing best practices. Applying leadership and 21st century skills, semifinalists exhibit proficiency by applying techniques to troubleshoot an industry-related challenge.

ELIGIBILITY

Two (2) individuals per chapter may participate.

TIME LIMITS

PRELIMINARY ROUND

- A. Participants have one (1) hour to complete the test.

SEMIFINAL ROUND

- A. Fifteen (15) minutes to complete the on-site skills challenge, broken down as follows:
 - 1. Ten (10) minutes are allotted for troubleshooting the problem
 - 2. Five (5) minutes to present the solution

ATTIRE

TSA competition attire is required.

PROCEDURE

PRELIMINARY ROUND

- A. Participants report for the test at the time and place stated in the conference program.
- B. Participants take the exam.
- C. A list of twelve (12) semifinalists (in random order) is posted.

SEMIFINAL ROUND

- A. Participants report to the time and place stated in the conference program to sign-up for the on-site challenge.
- B. At least ten (10) minutes prior to the scheduled time, semifinalists report at the time and place stated in the conference program for the on-site challenge.
- C. Participants have fifteen (15) minutes to complete the on-site challenge (see Time Limits).
- D. Ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRELIMINARY ROUND

- A. Participants take a multiple choice test to evaluate their knowledge of basic IT fundamentals.
- B. Tests may be administered online or via a scan-type answer sheet.
- C. Depending on the format of the exam, which will be posted on the Competition Updates page prior to the conference, participants shall be prepared to bring:
 - 1. Two (2) sharpened No.2 pencils
 - 2. One (1) laptop
 - 3. Extra charged laptop battery
- D. Should the test be administered online, participants are required to use their own laptops to take the timed exam. Participants will not:
 - 1. be required to download software on-site.
 - 2. have access to electrical power/outlets during the event.

E. Participants will:

1. be given one (1) hour to complete the sixty (60)-question exam with one (1) minute to read and answer each question.
2. may need to provide Internet access; TSA will not supply Internet.
3. not be allowed to use additional resources when taking the exam.

SEMIFINAL ROUND

- A. Semifinalists report to the time and place stated in the conference program to sign-up for the on-site challenge.
- B. Semifinalists report at the assigned time and place for the on-site challenge.
- C. Participants are administered the problem.
- D. Semifinalists are given ten (10) minutes to troubleshoot the issue.
- E. After ten minutes has commenced, the participant is allowed five (5) minutes to communicate the issue, approach, and resolution to the judges.
- F. All solutions must be tested, demonstrated and presented by participants in front of the judges.

EVALUATION

PRELIMINARY ROUND

- A. The test score

SEMIFINAL ROUND

- A. The solution

Refer to the official rating form for more information.

STEM INTEGRATION

Depending upon the subject of the problem, this event may align with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Information support & services
- Network systems
- Programming & software development
- Web & digital communications
- Help desk
- Computer software engineer

SAMPLE CHALLENGE TOPICS

This list serves only as an *example* of challenge categories.*

DEVICES

1. Recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices.

HARDWARE & SOFTWARE

1. Assess issues pertaining to hardware/software components
2. Assess issues pertaining to the collection and exchange of data

TROUBLESHOOTING

1. Systematically identify and fix problems with computing devices and their components.

NETWORK COMMUNICATION AND ORGANIZATION

1. Understand the role of protocols and how they enable secure and precise communication.

SAFETY LAW & ETHICS

1. Describe trade-offs between allowing information to be public and keeping information private and secure.

STORAGE

1. Represent data using multiple encoding schemes.

PROGRAM DEVELOPMENT

1. Systematically test and refine programs using a range of test cases to better meet the need of users and to evaluate whether programs function as intended.

CULTURE

1. Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options.
2. Discuss issues of bias and accessibility in the design of existing technologies.

*Challenge categories are based on the Computer Science Teachers Association (CTSA) K-12 standards.

FOUNDATIONS OF INFORMATION TECHNOLOGY (FIT)

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

☐ ENTRY NOT EVALUATED

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

TEST (50 points)

TEST SUBTOTAL (50 points)

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

PRELIMINARY SUBTOTAL (50 points)

SEMIFINAL CHALLENGE (50 points)

CRITERIA	Minimal performance	Adequate performance	Exemplary performance	Record scores in the column spaces below.
	1-4 points	5-8 points	9-10 points	
Troubleshooting (X2)	Participant did not understand the problem; the solution was not identified; participant did not demonstrate an understanding of basic IT knowledge; leadership and/or 21 st century skills are not evident.	Participant demonstrated an adequate understanding of the problem; the solution was identified, but the participant struggled with the application of the solution; leadership and/or 21 st century skills are somewhat evident.	Participant clearly understood the problem; solution was identified, and applied appropriately; leadership and/or 21 st century skills are clearly evident.	
Technical Skill (X2)	Participant did not demonstrate knowledge of and an understanding of how to utilize the technological equipment and techniques; participant shows little or no creativity in troubleshooting methods.	Participant demonstrates some knowledge of and understanding of how to utilize the technological equipment and techniques; participant shows some creativity in applied techniques.	Participant clearly demonstrates knowledge and understanding of how to utilize the technological equipment and techniques; participant shows creativity and a high level of skill in applied techniques.	

SEMIFINAL CHALLENGE (50 points) – continued				
Delivery (X1)	Participant is verbose and/or uncertain in his/her presentation; participants' posture, gestures, and lack of eye contact diminish the presentation.	Participant is somewhat well-spoken and clear in his/her presentation; participants' posture, gestures, and eye contact are acceptable in the presentation.	Participant is well-spoken and distinct in its presentation; the participants' posture, gestures, and eye contact result in a polished, natural, and effective presentation.	
SEMIFINAL CHALLENGE SUBTOTAL (50 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
SEMIFINAL SUBTOTAL (50 points)				
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.</p> <p>TOTAL (100 points)</p>				

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

FOUNDATIONS OF INFORMATION TECHNOLOGY (FIT)

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges, two (2) or more
- C. Assistants for the set-up, monitoring, and clean-up of the preliminary and semifinal challenges, two (2) or more

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants/proctors
 - 4. Results envelope with coordinator forms
- B. Tables and chairs for participants
- C. Tables and chairs for judges
- D. Coordinators are responsible for creating the test to be administered at the national conference; copies will be provided by the national TSA office.
- E. Answer sheets (scan-type) and paper (if applicable)
- F. Extra sharpened No.2 pencils (if applicable)
- G. Twelve (12) copies of a well-written, technologically appropriate problem that can be objectively measured, one (1) copy per individual
- H. Adequate conditions, tools, materials, monitoring, and testing devices for the problem
- I. Stopwatch or clock for the timekeeper

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.

- D. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is to begin, meet with judges to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRELIMINARY ROUND

- A. Prior to the conference, the event coordinator shall become familiar with the format of the exam (refer to the Competition Updates of the [TSA website](#)).
- B. Late participants, and or entries are considered on a case-by-case basis and only when lateness is caused by events beyond the participant's control.
- C. In order to compete, participants must be on the entry list or must have approval of the CRC.
- D. Participants registered but not present shall be disqualified, unless they have received approval from the CRC. No additional time will be granted to take the exam.
- E. Should the test be administered via scan-type answer sheet, proceed with the following steps:
 - 1. Begin the event at the scheduled time by closing the doors and checking the entry list.
 - 2. All participants should be in the room at this time.
 - 3. Distribute the answer sheet (scan-type) and paper.
 - 4. Monitor the one (1)-hour test.
 - 5. Score the exams if needed.
- F. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry

The event coordinator, judges and CRC manager must all initial either of these actions on the rating form.

- G. Judges determine the twelve (12) semifinalists and discuss and break any ties.
- H. Submit semifinalist results and all related forms in the results envelope to the CRC room.

SEMIFINAL ROUND

- A. Coordinate with the event manager to ensure that the stage is set for the on-site problem. Check and ensure that:
 - 1. the required technical equipment is in place and functioning as needed.
 - 2. the necessary connections are in place.
 - 3. the problem can be easily replicated.
- B. Semifinalists report at the time and place stated in the conference program to sign up for a skills presentation time.
- C. All solutions must be tested, demonstrated and presented by participants in front of the judges. Judges and assistants observe, with judges evaluating solutions as soon as appropriate.
- D. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- E. Judges determine the ten (10) finalists and discuss and break any ties.
- F. Submit the finalist results and all related forms in the results envelope to the CRC room.
- G. Manage the security and removal of materials from the area.

OVERVIEW

Applying leadership and 21st century skills, participants research and brainstorm the need for an invention or innovation of a device, system, or process related to the current year's theme, noted on the [TSA website](#) under Competitions/Themes and Problems. Team entries must include documentation of the team's work through an interactive display and a model/prototype. Semifinalists give an oral presentation to a panel of judges (who act as venture capital investors) to persuade the panel to invest in their invention/innovation. Judges interview the participants.

ELIGIBILITY

One (1) team of at least three (3) individuals per chapter may participate.

TIME LIMITS

Ten (10) minutes is allowed for the semifinal presentation broken down as follows:

- A. Two (2) minutes for set up
- B. Five (5)-minutes for an oral presentation
- C. Two (2) minutes for a question and answer session
- D. One (1) minute for the removal of presentation items

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants access the annual theme on the [TSA website](#) under Competitions/Themes and Problems.
- B. Participants concentrate their efforts in researching and identifying a need that has the potential for the invention/innovation of a device, system, or process.
- C. Participants design a scaled model/prototype, which may be a conceptual model or a working model of a device, system, or process.
- D. Participants document the design through the creation of an interactive display.

- E. Participants prepare an oral presentation that further explains the invention/innovation to a panel of judges acting as venture capitalists.

PRELIMINARY ROUND

- A. No more than two (2) team representatives report at the time and place stated in the conference program to check in:
 - 1. The interactive display
 - 2. The model/prototype
- B. Entries are independently reviewed by judges, with neither students nor advisors present.
- C. A list of twelve (12) semifinalists (in random order) is posted.

SEMIFINAL ROUND

- A. Semifinalists report at the time and place stated in the conference program to sign-up for the presentation.
- B. Up to three (3) representatives from each team report at the assigned time and place for the presentation and to respond to inquiries from the judges.
- C. Ten (10) finalists are announced at the awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRELIMINARY ROUND

- A. The invention/innovation entry (of a device, system, or process) must be the result of an identified need.
- B. Interactive Display:
 - 1. Invention Name
 - 2. Description of the invention/innovation
 - 3. Explanation of the necessity
 - 4. Description of brainstorming process

5. Drawings, or illustrations of the invention/innovation
 6. Process of building the model prototype
 7. The display must include at least three (3) elements that are interactive.
 8. The size of the display (the portfolio and the model/prototype) for the invention/innovation may not exceed 15" deep x 3' wide x 4' high.
 9. A/C electricity may not be used
 10. Dry cell or photo-voltaic cells may be used for power, if desired. Any power source used must fit within the maximum display area.
 11. If operating instructions are necessary, they must be clearly displayed.
 12. Violation of the following will result in disqualification:
 - a. No viruses, live plants, or animals may be used as a part of the display.
 - b. No harmful or illegal substances may be displayed.
- C. Model/Prototype:
1. The model/prototype may be a scaled version of the invention/innovation idea.
 2. The idea should be realistic and have the potential to be workable.
 3. The following options may be used to provide direct current electrical power for the model/prototype when it is demonstrated during the semifinalist presentation. **No other electrical source may be used.**
 - a. Up to 4 "C" or "D" batteries, OR
 - b. Up to 8 "AA" or "AAA" batteries
- D. Once the display set-up time frame has closed, participants may not re-enter the event area.
- E. Participants pick up their entries at the time specified in the conference program.

SEMIFINAL ROUND

A. The Oral Presentation

1. Time limits:
 - a. Two (2) minutes for set-up
 - b. Five (5) minutes for the presentation
 - c. Two (2) minutes for a question/answer session
 - d. One (1) minute for removal of the presentation items
2. The presentation is limited to three (3) teams. Each member should be an active participant in the presentation.
3. The use of visual aid material is encouraged.
4. Using leadership and/or 21st century skills, the goal of the team is to convince the judges that the invention/innovation is needed and has real-world potential.

EVALUATION

PRELIMINARY ROUND

- A. The interactive display
- B. The model/prototype

SEMIFINAL ROUND

- A. The presentation

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Engineer
- Multimedia designer
- Product designer
- Small business owner

INVENTIONS AND INNOVATIONS

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ Interactive display is present
- ☐ Model/Prototype is present
- ☐ ENTRY NOT EVALUATED

STATIC ENTRY (80 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Display (X2)	Display is not complete; the information is irrelevant to the invention/innovation, and the display is lacking in aesthetic quality.	Display includes most components; the idea featured is adequately described; the quality is aesthetically pleasing.	Display is complete; information presented promotes the invention/innovation exceptionally well, and the quality is aesthetically pleasing; the display incorporates the required interactive components.	
Need and Description (X2)	Description of need for invention/innovation is provided, but it is unclear and unconvincing; there is not enough detail; invention/innovation is not sensible, practical, or rational in nature.	Description of need for invention/innovation is generally convincing, with some detail; invention/innovation is realistic and generally meets the need as defined.	Description of need for invention/innovation is fully explained, defined, and detailed precisely; invention/innovation accurately and convincingly meets the need as defined.	
Illustration/Drawings (X1)	Only one or two illustrations/sketches of the model/prototype are displayed, with little or no evidence that a model/prototype was well-developed or utilized.	Adequate illustrations/sketches of the model/prototype are included and are generally representative of the concept.	High quality illustrations/drawings of the model/prototype are provided and documented completely.	
Brainstorming Process (X1)	Description of the brainstorming process includes little or no details.	Description of the brainstorming process is provided, and includes some detail about the process.	There is clear evidence that brainstorming served as a key component of the process.	
Model/Prototype (X2)	Model/Prototype is present but is not complete or is lacking in quality.	Model/Prototype is present and is good quality; the object portrays good craftsmanship and adequately portrays the invention or innovative ideal; the quality is generally aesthetically pleasing.	The Model/Prototype is complete and crafted exceptionally well, and quality is aesthetically pleasing; the model/prototype leaves no question to the idea or invention's use or reason.	
STATIC ENTRY SUBTOTAL (80 points)				

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

PRELIMINARY SUBTOTAL (80 points)**SEMIFINAL PRESENTATION/INTERVIEW (70 points)**

CRITERIA	Minimal performance	Adequate performance	Exemplary performance	Record scores in the column spaces below.
	1-4 points	5-8 points	9-10 points	
Organization (X1)	Participants seem unorganized and unprepared for the presentation/interview; illogical explanation of the need and solution is presented.	Participants are generally prepared for the presentation/interview; explanation of the need and solution are communicated and somewhat organized.	The presentation/interview is logical, well organized, and easy to follow; the need and solution are communicated in a concise manner.	
Knowledge (X1)	Participants seem to have little understanding of the concepts in their project; answers to questions may be vague.	Participants exhibit a basic understanding of the concepts in their project.	Participants show clear evidence of a thorough understanding of the concepts in their project.	
Articulation (X1)	Communication of the design process is unclear, unorganized, and or illogical; leadership and/or 21 st century skills are not evident.	Communication of the design process is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the design process is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
Delivery (X1)	The team is verbose and/or uncertain in its interview; participants' posture, gestures, and lack of eye contact diminish the presentation/interview.	The team is generally well-spoken and clear in its presentation/interview; participants' posture, gestures, and eye contact are acceptable.	The team is well-spoken and distinct in its presentation/interview; participants' posture, gestures, and eye contact result in a polished, natural, and effective presentation/interview.	
Creativity of Presentation (X2)	Presentation lacks imagination, originality, and detail; there is limited use of audio/visual materials.	Presentation is generally effective, innovative, and convincing; use of audio/video materials provides information about the invention/innovation.	Presentation is inspiring, inventive, resourceful, and completely convincing; use of audio/visual materials is exceptional in providing information about the invention/innovation.	
Team Participation (X1)	The majority of the delivery is made by one member of the team; the partner(s) are disengaged from the presentation.	Team members are generally engaged in the process, though one member may take on more responsibility than the other(s).	Team members are actively involved in the presentation and responses to interview questions; there is shared responsibility among the team members.	
SEMIFINAL PRESENTATION/INTERVIEW SUBTOTAL (70 points)				

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

TIME DEDUCTIONS

A five-(5) point deduction will be incurred for any time infraction.

SEMIFINAL SUBTOTAL (70 points)

To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.

TOTAL (150 points)

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

INVENTIONS AND INNOVATIONS

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more
- C. Assistants, two (2) or more

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge.
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stick-on labels for identifying entries
 - 5. Results envelope with coordinator forms
- B. Display tables for entries
- C. Table and chairs for team presentations, as needed
- D. Stopwatch
- E. Table and chairs for event coordinator and judges

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is to begin, meet with judges and assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

CHECK-IN

- A. Check in the entries at the time stated in the conference program.
- B. No more than two (2) team may check in:
 - 1. Interactive display
 - 2. Model/prototype
- C. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.
- D. In order to compete, participants must be on the entry list or must have approval of the CRC.
- E. Requirements for attire do NOT apply during check-in, only on the first day of the conference.
- F. Each entry must include the team's identification number in the upper right-hand corner of the display and somewhere visible on the model/prototype.

PRELIMINARY ROUND

- A. Judges independently review the entries.
- B. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry
 The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- C. Judges determine the twelve (12) semifinalists and discuss and break any ties.
- D. Submit semifinalist results to the CRC room.
- E. Create a sign-up sheet for semifinalist presentations and communicate any instructions to the semifinalist participants.
- F. Manage the pick-up of non-semifinalist entries.

SEMIFINAL ROUND

- A. Prepare a list of standard interview questions (five to ten [5-10]) to be asked of all participants.
- B. Semifinalists report at the time and place stated in the conference program to sign-up for the presentation.
- C. Semifinalists report at the assigned time and place for the presentation.
- D. Check in semifinalists and confirm with the teams their order of presentation and the procedure.
- E. Manage the presentations.
- F. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- G. Judges determine the ten (10) finalists and discuss and break any ties.
- H. Submit the finalist results and all related forms in the results envelope to the CRC room.
- I. Manage the removal of materials from the event area.

JUNIOR SOLAR SPRINT



OVERVIEW

Junior Solar Sprint (JSS), an Army Educational Outreach Program (AEOP), provides a hands-on opportunity for students in grades 5-8 to apply science, technology, engineering, and mathematics (STEM) concepts, along with leadership and 21st century skills such as creativity, teamwork, and problem-solving skills, as they design, construct, and race a solar-powered car.

A wealth of resources for teachers to implement the JSS program can be found on the [AEOP JSS website](#).

ELIGIBILITY

One (1) team of two to four (2-4) students per chapter may participate; one (1) entry per team.

Participants must be:

- A. Part of a registered Technology Student Association chapter, or
- B. Part of a group that competes at an approved Army host site

TIME LIMITS

All models meeting safety and performance criteria are given up to two (2) time trials.

ATTIRE

Participants may choose to wear either the TSA approved JSS T-shirt or the official TSA competition attire at the JSS time trials and semifinal event. T-shirts are distributed to each participating team member in the JSS event.

PROCEDURE

PRE-CONFERENCE

- A. Participants design and create their solar-powered car while working within the required specifications.
- B. Participants record their design processes in a documentation portfolio.

C. Participants prepare a display to showcase only:

- 1. The solar-powered model car
 - a. An 18" x 34" display area will be available for the cars during static judging
- 2. A decorated shoebox
- 3. The documentation portfolio

PRELIMINARY ROUND

A. Participants report to the time and place stated in the conference program and check in:

- 1. A solar-powered model car
- 2. The decorated shoebox
- 3. The documentation portfolio

B. Entries are reviewed by judges to determine specification adherence and safety on the track.

C. All models meeting safety and performance criteria will be given up to two (2) time trials.

- 1. The fastest time of these time trials will determine the sixteen (16) top semifinalist cars to be raced.
- 2. Cars that are disqualified for any reason will not be permitted to participate in the semifinalist races.

D. Four (4) evaluated areas will be used to determine final standings (see criteria for assessment and racing performance on the official rating form).

E. A list of sixteen (16) semifinalists will be posted.

SEMIFINAL ROUND

A. The semifinalist interview must include as many team members as possible.

B. The top sixteen (16) fastest cars from the time trials compete in a single or double elimination racing process. The process will be determined by the event coordinator.

C. Ten (10) finalists (selected based on the elimination racing process) will be announced during the conference award ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRE-CONFERENCE

A. Documentation Portfolio:

1. Documentation materials (comprising “a portfolio”) are required and must be secured in a [clear front report cover](#) with the following single-sided, 8½" x 11" pages, in this order:
 - a. Title page with the event title, conference city and state, the year, and the team/chapter ID number; one (1) page
 - b. Table of contents; pages as needed
 - c. Project Log (see the Competition Project Log attached to this event) that indicates preparation for the competition, as noted by date, task, time involved, obstacles/issues encountered, modifications made, team member responsible, and any comments; pages as needed
 - d. Design drawings; pages as needed
 - i. Must show the model with a minimum of two (2) views
 - ii. The drawings must be developed using standard engineering practices and procedures (including measurements/dimensions)
 - iii. The drawings may be produced using traditional drafting methods or CAD
 - iv. Rough sketches should be included
 - e. Design details of the model, including model size, wheel size, gear ratio, specifications of the motor and solar panel used, etc; one (1) page
 - f. Components list; one (1) page (see the Supplied Components worksheet attached to this event)

- g. Design process description, including pre-testing notes of various configurations of the model and revision notes about the model design throughout the process; pages as needed
- h. Sections of the portfolio may be organized by dividers

B. Display:

1. must include the model, decorated shoebox and portfolio only.
2. A decorated shoebox will be used as the display stand for the model car:
 - a. The shoebox must be decorated and reflect creativity.
 - b. The shoebox must have a label with a team ID.
3. The portfolio must be placed with the model car.

C. Solar-Powered Model Car:

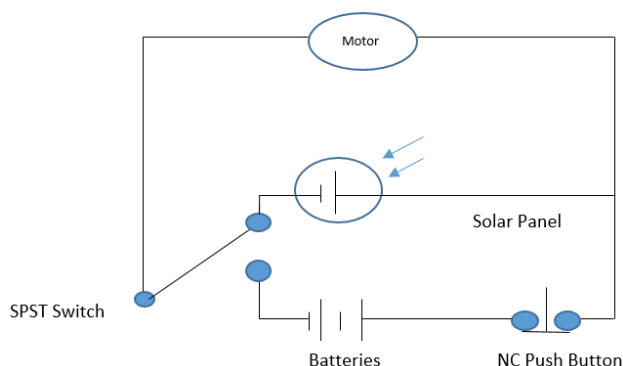
1. The model must accurately reflect the design process outlined in the online resources found on the AEOP [JSS website](#).
2. The materials used to construct the model car must cost less than \$50.
3. Original receipts for all materials purchased must be recorded in the Supplied Components List
4. If using recycled materials, documentation must show how these items were obtained.
5. Recycled materials are not included in the \$50 maximum.
6. Model cars that exceed the \$50 construction cost limit will be disqualified from the competition.
7. The vehicle must be structurally sound without the solar panel attached.

D. Solar Paneling:

1. One (1) solar panel (limited to a maximum output of 3.2 W), and one (1) motor (limited to a maximum 3.0 VDC) are allowed per car.

2. The Ray Catcher Sprint Kit sold by Pitsco (www.pitsco.com/Ray-Catcher-Sprint-Kit) or the JSS Solar Panel sold by Solar Made (www.solarmade.com/store/product/jss-kit) are the only panels that can be used in the competition.
 3. Solar panels cannot be shaved, drilled, or delaminated.
 4. Only the motor supplied in the kit can be used.
 5. Motors cannot be re-wound or disassembled.
 6. If an evaluation group convened by the event coordinator determines that the solar panel and/or motor have been modified, the car and team will be disqualified from the competition.
 7. The solar panel cannot be used as the chassis, or body, of the car.
 8. The axles and wheels cannot be directly attached to the solar panel.
 9. Reflectors, supports, and power leads can be added to these components as needed, but they must fit within the required dimensions.
 10. The model car must, with the solar panel attached, not exceed the following dimensions:
 - a. 60 cm (23 $\frac{5}{8}$ inches) length
 - b. 30 cm (11 $\frac{13}{16}$ inches) width
 - c. 30 cm (11 $\frac{3}{4}$ inches) height (as measured from the surface the car is resting upon to the highest point of the car, with all its components attached)
 11. Each vehicle must include a mounted battery holder that is capable of holding two AA batteries. The battery holder needs a switch or another easy device to operate a method of 'switching on' the battery power at the starting line. For example, a Single Pole Double Throw (SPDT) switch with a Normally Closed (NC) push button in series would be appropriate. In addition, a center-off type switch could be used.
 12. The team is encouraged to decorate the body of the car, but a clearly visible 3 cm square space must be available on the car to display the team ID#.
 13. If it is determined that the vehicles will be raced using solar power, the sun's light is the only energy source that can be used to power the vehicle. Batteries, capacitors, flywheels, or any other energy storage devices are prohibited.
 14. If the sun's energy is judged insufficient by the event coordinator, two (2) AA 1.5 V batteries will be furnished for each team.
 - a. Only the provided batteries are permitted to power the model.
- E. A student-designed attachment device must be part of the car to accommodate the easy attachment and removal from a guide wire for steering. A purchased screw eye or eye bolt is not considered a student designed attachment device.
1. A guide wire, such as fishing line, will be no more than 1.5 cm ($\frac{5}{8}$ ") from the surface of the track.
 2. The wire will go through the attachment device on the car and serve as a steering mechanism to keep the car in its lane. **This must be done without disconnecting the guide wire.**
 3. Both ends of the guide wire will be fixed to the track. This is the only allowable method of steering the car.
 4. No radio control is permitted in the car.
 5. Lane changing or lane crossing will result in a Did Not Finish (DNF) standing.
 6. A car's race that is impacted by an out-of-control vehicle will be allowed an opportunity to run the race again.

JSS Wiring Diagram



7. A car that lacks steering control and interferes with other cars in other lanes will not be allowed to race again.
- F. If a car is deemed unsafe, it will not be allowed to run in the time trials or the semifinalist races.
- G. If the model is safe, but does not meet the required specifications, it will be allowed to run in the time trials but not the semifinalist races.
- H. The remainder of the vehicle can be innovative in design and materials.

PRELIMINARY ROUND

Time Trials

- A. The race lane must be 60 cm wide and 20 m long.
- B. The track will be a hard flat surface, such as a tennis court or a smooth-surfaced running track.
- C. The time trial/race specifications are as follows:
 1. Tables will be set up for teams to make adjustments and minor repairs to cars prior to each time trial and the semifinalist heats.
 - a. Teams that are “next up” to be timed or raced are given priority to use the tables.
 - b. Teams must supply their own tools.
 2. Time trials and semifinalist races will not be delayed to permit adjustments or repairs to cars. If a repair is needed during time trials, a three (3)-minute time limit for repairs will be permitted.
 3. Prior to semifinals, teams will have an opportunity to perform up to two (2) trial races during a practice run session.
 4. At race time, each car will be placed with the most forward part of the vehicle set even with the starting line and all of its wheels in contact with the ground.
 - a. Each solar car’s panel car will be covered completely by an opaque sheet covering that does not touch the solar panel.
 - b. The opaque sheet will be removed at the start of the race, allowing the vehicle to collect solar power and start driving.
 5. No more than two (2) team representatives will be allowed in the race area; one at the starting line, one to catch.
6. All cars will be started when the official signal is given.
 - a. Each car will have up to two (2) time trials, unless otherwise determined by the event coordinator.
 - b. The fastest time recorded will determine the sixteen (16) cars to race in the semifinal portion of the event.
 - c. If, for any reason, a car is not able to participate in the time trials, or race at its scheduled time, it may be disqualified.
7. The judges will note the official time for each time trial.
 - a. At the time designated, if a car does not start the time trial, OR if during the time trial it does not finish, it will be noted as a Did Not Finish (DNF).
 - b. If a car has a false start, the entry will be given one (1) more opportunity to race.
8. One (1) team member must wait at the finish line to catch the vehicle for each timed trial. Team members are responsible for finding someone to catch their vehicle if another team member is unavailable.
9. After each timed trial or race, the vehicle and team member must remain at the finish line until the time is recorded for the vehicle.
10. No one, including team members and spectators, may accompany or touch the vehicle on the track during a timed trial or semifinalist race.
 - a. Vehicles stalled on the track can be retrieved after the end of the trial or the race has been declared by the lead judge.
 - b. A violation of this rule will result in disqualification of the offending team.
11. Challenges must be made before the next timed trial or race begins.
 - a. Any challenges must come from team members who are actively competing, not the coach/advisor, parent, or coordinator.
 - b. Any challenges need to be directed to the lead judge.
 - c. The decisions of the judges regarding challenges are final.

12. Only competing students and race officials may be in the race area.
 - a. Spectators, including coaches/advisors, parents, coordinators, and non-competing students, must remain in the designated spectator area throughout the duration of races.
 - b. Teams will be disqualified if a spectator, including a coach/advisor or parent, interferes with a race. This includes a coach/advisor or parent helping team members get their car on/off the guide wire.
13. Judges may inspect cars at any time before, during, and after timed trials or semifinalist races.
14. Any additional rules, regulations, or guidelines established by the event coordinator must be followed.

SEMIFINAL ROUND

Semifinalist Racing

- A. Regulations and procedures outlined in the preliminary round time trials are repeated for semifinalist racing.

EVALUATION

PRELIMINARY ROUND

- A. The documentation portfolio
- B. The artisanship and engineering of the model solar car
- C. Creativity in the decoration of the shoebox
- D. The model's racing performance
- E. Time trials

SEMIFINAL ROUND

- A. The semifinalist interview, which includes all team members
- B. The time trials regulations in the preliminary round also apply to the semifinal races. Semifinalist racing of the top sixteen (16) time trial winners, which will be conducted using a double elimination bracket. Teams will be ranked based on their fastest recorded time from time trials. Semifinal races will not be timed, however, the winner will be determined by the car that crosses the finish line first, barring any penalties.

Refer to the official rating form for more information.

NOTES

- A. Junior Solar Sprint (JSS) is an Army Educational Outreach Program (AEOP) competition. Information about AEOP opportunities can be found at www.usaeop.com.
- B. An array of support materials, such as correlations to STEM standards, a glossary of terms, course outlines, and lesson plans can be found at www.usaeop.com/program/jss once registered.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Energy efficiency technician
- Mechanical engineer
- Solar engineer
- Solar panel installer
- Solar sales consultant

COMPETITION PROJECT LOG

JUNIOR SOLAR SPRINT COMPETITION

Date	Task	Time involved	Team member responsible	Obstacles encountered	Modifications made	Comments
1.						
2.						
3.						
4.						
5.						
6.						
7.						

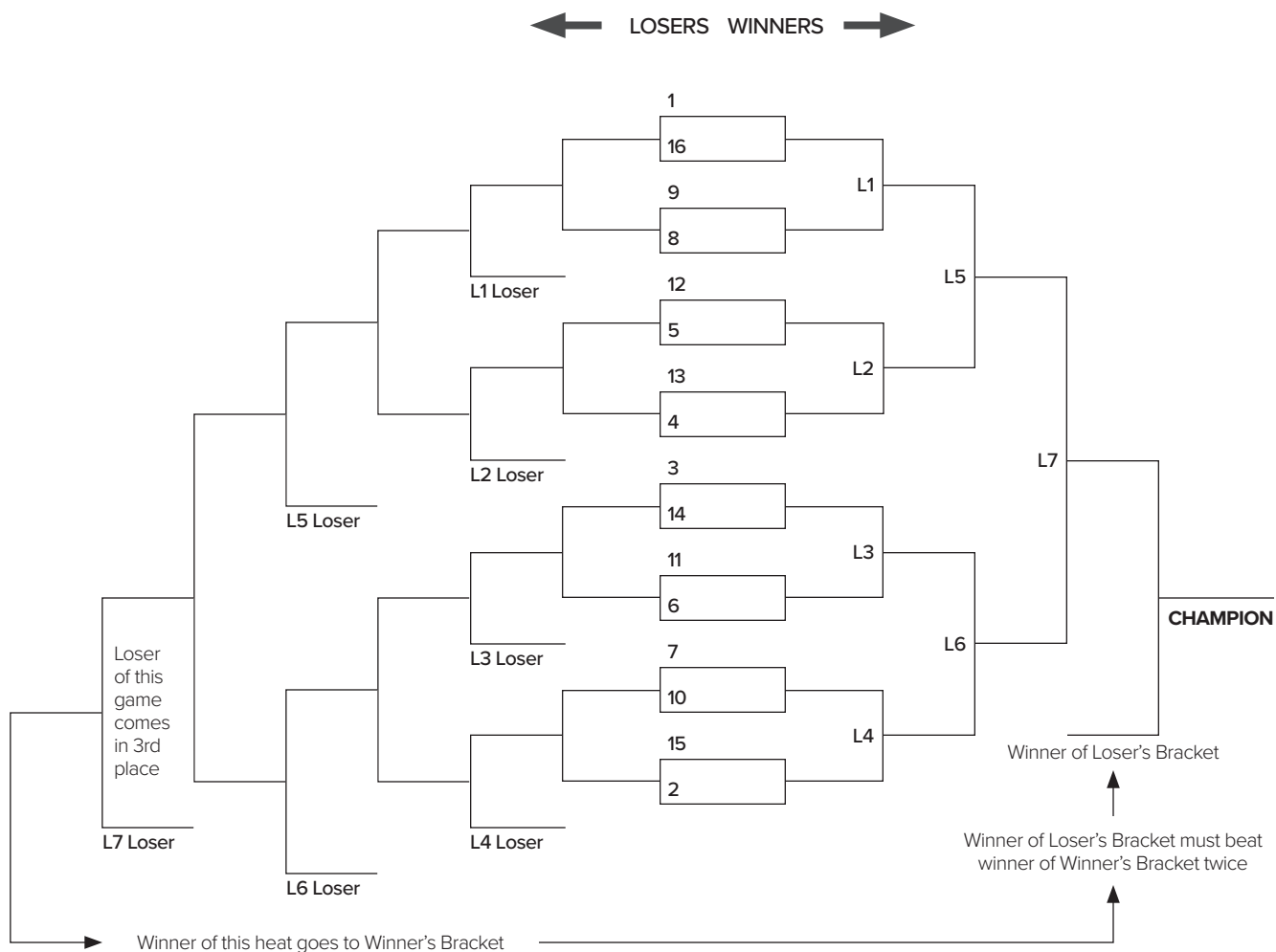
Advisor Signature: _____

SUPPLIED COMPONENTS LIST

[illegible]

RACE BRACKET FOR 16-CAR DOUBLE ELIMINATION

Double Elimination Tournament Chart Seeded 16 player Field



JUNIOR SOLAR SPRINT

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ Documentation portfolio is present
- ☐ Model car with solar panel is present
- ☐ A decorated shoebox
- ☐ The model is safe to participate in the time trials and, if deemed appropriate, the semifinalist races
- ☐ The model meets all required specifications
- ☐ ENTRY NOT EVALUATED

DISPLAY AND MODEL (80 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Display/Decorated Shoebox (X2)	The quality of the display is extremely poor and/or exceeds size requirements; the shoebox is not decorated and there is no creativity.	The display is adequately created and meets the size specifications; the shoebox is decorated and creative.	The display is exemplary, includes eye-catching details, and meets the size specifications; the shoebox is creatively decorated and shows exceptional originality.	
Model Design (X2)	The design of the solar model is poor and shows little effort.	The design of the solar model is adequate but not of exceptional quality.	The design of the solar model exhibits exceptional quality.	
Model Creativity/Originality (X2)	The solar model car design lacks creativity and originality; little effort is apparent; car is an exact, or nearly an exact replica of purchased kit.	The solar model car design demonstrates an adequate level of creativity and originality; at least one (1) modification has been made to the car.	The solar model car design shows exceptional creativity, originality, artisanship, and engineering.	
Model Construction (X2)	The solar model car lacks quality of construction.	The solar model car demonstrates adequate quality of construction.	The solar model car demonstrates exceptional quality of construction.	
DISPLAY AND MODEL SUBTOTAL (80 points)				

DOCUMENTATION PORTFOLIO (50 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Portfolio Components (X1)	A number of portfolio components are missing.	Most of the portfolio components are included, but the portfolio lacks overall quality.	The portfolio includes all required components; it is neat and properly organized; effort and quality are evident.	
Project Log (X1)	The Project Log is lacking significant portions; it is messy and demonstrates lack of effort.	The Project Log is acceptable, with most information included.	The Project Log is complete and accurate; the presentation is neat and orderly; a great deal of effort is evident.	
Design Drawings (X1)	Some drawings are missing and/or drawings are of poor quality.	Drawings are acceptable; all required views are shown.	Drawings are accurate and complete; all required views are present; rough sketches are included.	
Design Details/ Components List (X1)	Several details of the model, such as model size, wheel size, and gear ratio are missing and/or are poor; the components list is very limited.	Most details of the model, such as model size, wheel size, and gear ratio are included; most components are included.	All details of the model, such as model size, wheel size, and gear ratio are present; all components are included.	
Design Process Description (X1)	The design process description lacks detail and is poorly documented.	Most of the design process description is present.	All parts of the design process description are present.	
DOCUMENTATION PORTFOLIO SUBTOTAL (50 points)				

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right. Indicate the rule violated: _____	
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PRELIMINARY TOTAL (130 points)	
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RACE (60 points)								
1st	2nd	3rd	4th	5th & 6th	7th & 8th	9th-12th	13th – 16th	
60 Points	55 Points	50 Points	45 Points	40 Points	35 Points	30 Points	25 Points	
RACE SUBTOTAL (60 points)								

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right. Indicate the rule violated: _____	
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CAR BUILDER INTERVIEW (40 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Car Builder Interview (X2)	The student shows very limited knowledge of (and has difficulty articulating) how the car was produced or decisions made during the production; the student exhibits a basic understanding of design elements and functionality, and the rationale is inconsistent or absent.	The student demonstrates some knowledge of the vehicle production and has adequate knowledge of some processes or reasoning behind the vehicle design.	The student shows competence and knowledge related to the design and production of the vehicle; the student is able to articulate "reasoning" behind the decisions made.	
Articulation (X2)	Communication of the design process is unclear, unorganized, and or illogical; leadership and/or 21 st century skills are not evident.	Communication of the design process is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the design process is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
CAR BUILDER INTERVIEW SUBTOTAL (40 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
SEMIFINAL TOTAL (100 points)				
<p>To arrive at the FINAL TOTAL score, subtract rules violation points, as necessary.</p> <p>TOTAL SCORE (100 points)</p>				

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

JUNIOR SOLAR SPRINT EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges, six (6) or more
- C. Assistants, six (6) or more

MATERIALS

- A. Coordinator's packet containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. Stick-on labels for identifying entries
 - 4. Race bracket form
 - 5. Results envelope with coordinator forms
- B. Batteries (AA 1.5 V) (in the event that the sun provides insufficient energy), two (2) per entry plus spares on-site
- C. Braided fishing line for the track:
 - 1. Four (4) pre-tied
 - 2. Two (2) on track
- D. Race track set, including a starting gate and finish gate with digital timer
- E. Spare stopwatches for back-ups
- F. Padding for the finish gate
- G. Tables for the display and evaluation of entries (cars and portfolios)
- H. Lane Assignment Board to be used for a display of semifinals racing
- I. Tables and chairs for event coordinator, judges, and official assistants
- J. A large display for the final 16 bracket
- K. A gauge to measure line height at the beginning and end of the line

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event will be held for appropriate set-up, including location for displays and the evaluation of portfolios, racing site, chairs, tables, outlets, etc.
- E. At least one (1) hour before the event is to begin, meet with judges and assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRELIMINARY ROUND

- A. Participants report to the time and place stated in the conference program and check in:
 - 1. The solar-powered model car and decorated shoebox
 - 2. The documentation portfolio
- B. Secure the entries in the designated area.
- C. Late participants and/or entries are considered on a case-by-case basis and only when lateness is caused by events beyond the participant's control.
- D. In order to compete, participants must be on the entry list or must have approval of the CRC.
- E. Position the Junior Solar Sprint portfolios and models for viewing by the judges, and assist them as necessary during judging.
- F. Set up the race track prior to the time trials. Make necessary adjustments.
- G. Permit all vehicles (that can be safely operated) to participate in time trials.

- H. Vehicles that are disqualified will NOT be permitted to participate in the semifinalist races.
- I. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 1. To deduct twenty percent (20%) of the total possible points in this round
 2. To disqualify the entry
 The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- J. Judges determine the sixteen (16) semifinalists.
- K. Submit the semifinalist results to the CRC room.

SEMIFINAL ROUND

- A. Post the top sixteen (16) cars with interview times.
- B. Car builders will report to the track at the posted time for a five (5)-minute car builder interview.
- C. Conduct interviews with the qualifying top sixteen (16) car builders.
- D. Begin the semifinals at the scheduled time.
- E. Run the semifinalist race. A sample double-elimination bracket follows.
- F. Only the sixteen (16) qualifying cars are raced.
- G. Public viewing is allowed.
- H. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- I. Judges use qualifying times to break any ties among the sixteen (16) qualifying cars.
- J. Submit the finalist results and all related forms in the results envelope to the CRC room.
- K. If necessary, manage the security and removal of materials from the event area.

LEADERSHIP STRATEGIES



OVERVIEW

Applying leadership and 21st century skills, teams prepare a presentation based on a selected challenge that TSA officers might encounter, within a specified, limited amount of time.

ELIGIBILITY

Three (3) teams of three (3) individuals per state may participate.

TIME LIMITS

- A. Presentations must be between three and five (3-5) minutes.
- B. Teams will be penalized one (1) point per ten (10) seconds for speaking over five (5) minutes or under three (3) minutes.
- C. Time commences when the first team member begins talking and concludes at the end of the presentation.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRELIMINARY ROUND

- A. Team members report to the event area at the time and place stated in the conference program to sign up for a presentation time.
- B. Participants report at the time and place stated in the conference program, five (5) minutes prior to the assigned presentation time.
- C. At the team's assigned time, one (1) team member draws three (3) cards – each containing one (1) topic – from a box and selects one (1) topic from the three (3) on which the team presents. The cards with the unused topics are returned to the box.
- D. After selecting a topic, the first team enters a preparation room separate from the presentation room and is given fifteen (15) minutes to prepare the team presentation. Multiple teams may be in the preparation room together during the rotation period due to conference logistics.

- E. The event coordinator introduces each team by team identification number only in the order of the sign-up time.
- F. As participants present, the timekeeper visually notifies the team of the time remaining for the presentation by using six (6) separate note cards. Each of the 5" x 7" note cards has a "time remaining in minutes" number on it (4, 3, 2, 1, ½, and 0), and each is shown to the team in descending order by the timekeeper during the presentation.
- G. After speaking, the team returns the topic card to the judges.
- H. Judges independently score each presentation according to the criteria on the official rating form.
- I. A list of twelve (12) semifinalists (in random order) is posted.

SEMIFINAL ROUND

- A. Participants report at the time and place stated in the conference program to sign up for a presentation time.
- B. Participants report at their assigned time and place for the same procedure used in the preliminary round, but with a different set of topics.
- C. Ten (10) finalists are announced during the conference award ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

- A. No reference may be made concerning the name of the team, the team members, or their school.
- B. Each presentation must be the result of the team's own effort.
- C. No reference materials or devices may be brought to the preparation room.
- D. Any notes for the presentation must be written during the fifteen (15)-minute preparation period.
 - 1. Each team is provided a maximum of three (3) 3" x 5" blank notecards.

2. Although teams are permitted to use notes when speaking, it should be noted that deductions in scoring may be made for this practice if it detracts from the effectiveness of the presentation.
- E. No observers are allowed in the event or preparation rooms during heats, though they may be present during the semifinals.
 1. No talking or gesturing is permitted.
 2. Observers are NOT allowed to enter or leave during a presentation.
 3. THERE IS NO APPLAUSE UNTIL THE PRESENTATION HAS CONCLUDED.
- F. Teams are penalized one (1) point per ten (10) seconds for speaking over five (5) minutes or under three (3) minutes.
- G. Each member of a team must participate in the presentation.

Sample Topic Questions:

Topics that might be encountered by teams in this event may include but are not limited to:

1. A newly created school ruling does not allow for school related travel out of state. How will your chapter approach a solution to the problem?
2. A mandated curriculum severely limits opportunities for students to select and schedule elective courses such as technology education. What can be done to resolve this issue?
3. Plans to upgrade athletic facilities within the school district severely limit previously approved plans to fund technology education with needed maintenance and equipment expenditures. What will you do in an attempt to resolve this dilemma?
4. A school policy that pertains to fundraising activity now requires such funds to become part of a general pool to be distributed at the discretion of the school administrator regardless of who or how they were raised. What will be your plan of action to reverse this decision?
5. Conflict exists within the local chapter related to members who are not engaged within their committee assignments. If the problems are not resolved, the health of the chapter will deteriorate. How do you plan to solve this problem?

6. It is assumed that our school's technology and engineering program will be strengthened through the support of local businesses and industries. Currently, there is little participation of these groups. How might we change this?

EVALUATION

A. The presentation

Note: Scores are reset for the semifinal round and are not added to the preliminary scores.

Refer to the official rating form for more information.

NOTE

Participants are encouraged to rely on an outline format in presenting their plans, using short sentences and bullet points as appropriate.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the career areas featured in the TSA AND CAREERS section of this guide. Careers will vary based on the student's area of interest.

LEADERSHIP STRATEGIES

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

☐ A team of three individuals is present

☐ ENTRY NOT EVALUATED

PRESENTATION (80 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Communication of Problem (X1)	It is difficult to understand the problem being communicated.	The problem is communicated in a somewhat organized and/or concise manner.	Communication of the problem is presented in an organized, clear, and concise manner.	
Communication of Solution (X1)	It is difficult to understand the solution being communicated.	The solution is communicated in a somewhat organized and/or concise manner.	Communication of the solution is presented in an organized, clear, and concise manner.	
Impact (X2)	The presentation is unconvincing, uninteresting, and/or lacks compelling and attention-holding ideas.	The presentation is somewhat convincing, with generally interesting ideas.	The presentation is convincing, with compelling and attention-holding ideas.	
Team Participation (X2)	The majority of the delivery is made by one member of the team; the partner(s) are disengaged from the presentation; leadership and/or 21 st century skills are not evident.	Team members generally are engaged in the process, though one member may take on more responsibility than the other(s); leadership and/or 21 st century skills are somewhat evident.	All team members are equally and actively involved in the presentation; leadership and/or 21 st century skills are clearly evident.	
Team Presence (X1)	The team's appearance is unprofessional, sloppy, and inappropriate.	The team's appearance is adequate, appropriate, and professional.	The team's appearance is appropriate, professional, and polished.	
Delivery (X1)	The team is verbose and/or uncertain in its presentation; participants' posture, gestures, and lack of eye contact diminish the presentation.	The team is somewhat well-spoken and distinct in its presentation; participants' posture, gestures, and eye contact are acceptable in the presentation.	The team is well-spoken and distinct in its presentation; participants' posture, gestures, and eye contact result in a polished, natural, and effective presentation.	
PRESENTATION SUBTOTAL (80 points)				

TIME DEDUCTIONS		Record scores in the column spaces below.
One (1) point per ten (10)-second interval is to be deducted for speaking under the three (3) minutes or over the five (5) minutes allotted for the presentation. Presentation time commences when the first presenter begins speaking.		
PRESENTATION DELIVERY TIME		
TOTAL TIME DEDUCTION POINTS		
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>		
SUBTOTAL (80 points)		
To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.		TOTAL (80 points)

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

LEADERSHIP STRATEGIES

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more, for the first round of presentations
 - 2. Semifinal round, two (2) or more for semifinalist presentations
- C. Timekeepers for recording presentation start/stop times, one (1) per event room
- D. Monitors, one (1) per event room

MATERIALS

- A. Coordinator's packet containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Results envelope with coordinator forms
- B. Speaker's stand/podium
- C. Stopwatches for timekeepers, one (1) per heat and two (2) per preparation room
- D. Six (6) 5" x 7" notecards for "time remaining in minutes" numbers (see Procedure E)
- E. 3" x 5" blank notecards, for participants to outline their presentation
- F. 3" x 5" topic cards – a minimum of five (5) different topics from which to select
- G. Tables and chairs in the preparation room
- H. Chairs for the audience, for semifinals only
- I. Table and chairs for the event coordinator, judges, and timekeeper

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is being held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is to begin, meet with judges and assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRELIMINARY ROUND

- A. Manage the smooth flow of participants according to these procedures:
 - 1. After selecting a topic from the three (3) randomly drawn topics, the first team enters a preparation room separate from the presentation delivery room and is given fifteen (15) minutes to prepare a presentation.
 - 2. Seven (7) minutes after the first team enters the preparation room, the second team enters the preparation room, goes to a different section of the room, and begins its presentation preparation, again with fifteen (15) minutes allowed for preparation; and so on for all the teams.
 - 3. Each team in turn is allowed to enter the presentation room at seven (7)-minute intervals, thus enabling a constant flow of participants to speak before the evaluators in a timely fashion. (This allows for one [1] minute to enter the presentation room and announce the entry number, up to five [5] minutes for the presentation, and one [1] minute to exit the room.)

4. The event coordinator introduces each team by registration number only in the order of the sign-up time.
- B. After speaking, the team returns the topic card to the judges so that it can be returned to the topics box.
- C. Judges independently rate each presentation according to the criteria on the official rating form.
- D. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 1. To deduct twenty percent (20%) of the total possible points in this round
 2. To disqualify the entryThe event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- E. The timekeepers notify judges of any time under three (3) minutes or over five (5) minutes, for which deductions should be made.
- F. When teams have finished, judges determine the semifinalists, consulting the timekeeper's record.
- G. Judges determine the twelve (12) semifinalists (if heats are used), and discuss and break any ties.
- H. Submit semifinalist results to CRC for posting.
- I. Create a semifinal sign-up sheet for presentations.

SEMIFINAL ROUND

- A. Repeat the preliminary round processes to determine the finalists.
- B. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- C. Judges determine the ten (10) finalists and discuss and break any ties.
- D. Submit the finalist results and all related forms in the results envelope to the CRC room.
- E. If necessary, manage security and the removal of materials from the area.

OVERVIEW

Applying leadership and 21st century skills, participants manufacture a marketable product addressing the annual theme, noted on the [TSA website](#) under Competitions/Themes and Problems. Teams create three identical copies to demonstrate their skill and knowledge pertaining to the mass production process, however, the official entry is comprised of a documentation portfolio and only one (1) prototype. Semifinalists present their product and participate in a interview.

ELIGIBILITY

One (1) team of at least two (2) individuals per chapter may participate.

TIME LIMITS

SEMIFINAL

- A. Up to five (5) minutes for the presentation
- B. Up to five (5) minutes for the interview.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants access the annual theme on the [TSA website](#) under Competitions/Themes and Problems.
- B. Research designs for products and develop a prototype that can be replicated for three [3] identical copies of the product. Only the one (1) prototype will be submitted on-site as part of the entry.
- C. Create working drawings and devise production plan flow chart(s).
- D. Tool up for production.
- E. Conduct a trial run and evaluate the process for effectiveness and efficiency.
- F. Manufacture several products using line production techniques.

- G. Document the process with photographic images and of the additional copies of the prototype as part of the portfolio submission.

- H. Document the team project with a photo time line.

PRELIMINARY ROUND

- A. No more than two (2) team representatives report at the time and place stated in the conference program to check in:
 - 1. The documentation portfolio
 - 2. The prototype
- B. Entries are independently reviewed by judges with neither students nor advisors present.
- C. A list of twelve (12) semifinalist teams (in random order) is posted.

SEMIFINAL ROUND

- A. Two (2) semifinalist team representatives report to the time and place stated in the conference program to sign up for an interview time.
- B. At least two (2) team representatives report at the assigned time to the place stated in the conference program for the presentation/interview.
- C. Semifinalist teams present to the judges explaining the manufacturing process used in the production of the product.
- D. The presentation is followed by an interview.
- E. The top ten (10) finalists are announced at the awards ceremony.
- F. No more than two (2) students pick up their team's entry from the display area at the time and place stated in the conference program.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRE-CONFERENCE

A. Documentation Portfolio:

1. Documentation materials (comprising “a portfolio”) are required and must be secured in a [clear front report cover](#) with the following single-sided, 8½" x 11" pages, in this order:
 - a. Title page with the event title, the product name, the conference city and state, the year, and the team/chapter ID number; one (1) page
 - b. Table of contents
 - c. Description of the product: a written description of the product, instructions for its use, the overall advantages and usefulness of the product, its audience, and related safety considerations; one (1) page
 - d. Design efforts: sketches, pictures, magazine clippings, and other graphic design elements used in the development of the final design; three (3) pages maximum
 - e. Drawings:
 - i. An orthographic drawing in three (3) views with dimensions to aid production; one (1) page
 - ii. An assembly drawing or a pictorial drawing with labels; one (1) page
 - f. Materials list: a list of materials (including sizes and market value) used to fabricate the product; each item or sub-assembly should be identified as student produced, standard stock item, or purchased subassembly; one (1) page
 - g. Tools and machines list: a list of any hand, power, and stationary tools and/or machines used to fabricate the product; one (1) page
 - h. Production plan: a production outline or flow chart; up to two (2) pages
 - i. Photographic verification: photographic or digital images that verify the mass production of three (3) total identical copies including the prototype; up to two (2) pages

2. All documentation must be contained in the portfolio.
3. Tabs or dividers may be used between sections of the portfolio and are not counted as pages.
4. Sheet protectors may be used.

B. Prototype of Product:

1. Craftsmanship:
 - a. The product must display good craftsmanship.
 - b. The product must maintain tolerances as indicated by the working drawings.
2. Appropriate materials: The product must use the materials in a manner that adds value to the product.
3. Efficiency of design: The product must address the identified consumer need, and use the materials effectively.
4. Aesthetics: The product must be pleasing to view.
5. Ergonomics: The product must be easy to use.
6. Appropriate solution: The product must function in a manner that solves the identified problem.
7. Creativity: The product must display an original solution to the identified consumer need.
8. ONLY the documentation contained within the portfolio and the prototype may be submitted for judging.
9. The documentation and prototype must be displayed in such a way that they do not exceed 15" deep x 15" wide x 15" high. Participants are encouraged to stack their items to avoid exceeding these limits.
10. A twenty percent (20%) deduction of the total possible points will take place should one (1) product copy and the documentation be displayed in a manner that exceeds the dimensions outlined.

PRELIMINARY ROUND

- A. No more than two (2) team representatives may turn in an entry.
- B. Entries are independently reviewed by judges with neither students nor advisors present.

SEMIFINAL ROUND

- A. Teams may bring and use audio/visual materials or a laptop for their presentation. Projectors and screens are not permitted.

EVALUATION**PRELIMINARY ROUND**

- A. The documentation
B. The prototype

SEMIFINAL ROUND

- A. The presentation/interview

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Electromechanical engineer
- Mechanical drafter
- Production planner
- Standards engineer

MASS PRODUCTION

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

-
- ☐ Documentation portfolio is present
 - ☐ One (1) copy of the prototype is present
 - ☐ Portfolio and single copy of prototype does not exceed 15" x 15" x 15"
 - ☐ ENTRY NOT EVALUATED

DOCUMENTATION PORTFOLIO (70 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points	
Portfolio (X1)	Portfolio is missing several components and/or is unorganized; it is messy and lacking quality.	Most components are included; portfolio is generally organized and displays some quality.	All components are included; effort and quality of work are evident.	
Description of Product Instructions for use (X1)	Description of the product and instructions for its use are unclear.	Description of the product and instructions for its use are somewhat defined and explained.	Description of the product and instructions for its use are defined and explained precisely.	
Design Efforts (X1)	Most design effort components are missing, and/or they are unorganized; they are messy and lack quality.	Some design effort components are included; components are generally organized and display overall quality.	Design effort components are included; effort and high quality of work are evident.	
Working Drawings (X1)	Working drawings are sloppy and disorganized; they do not demonstrate labeling and dimensioning.	Working drawings are of sufficient quality, and most are labeled and dimensioned.	Working drawings are of excellent quality and are correctly labeled and dimensioned.	
Materials List Tools and Machines List (X1)	Lists are missing several components, and/or they are unorganized.	Most components are included; the lists are generally organized and complete.	All components are included and organized in the lists.	
Production Plan (X1)	Plan is missing several components, and/or it is unorganized.	Components of the plan are mostly included, and the plan is generally organized.	All components are included and well-organized in the plan.	
Photographic Verification (X1)	Photographic verification is not complete, and/or images are missing.	Photographic verification is complete, and the quality of images is adequate.	Photographic verification is clear and supports all aspects of the process.	
DOCUMENTATION PORTFOLIO SUBTOTAL (70 points)				

PROTOTYPE (40 points)					
Product (X2)	Product is not built to detailed standards; it is poorly constructed and finished; it lacks creativity and imagination.	Product is somewhat built to detailed standards; the design is satisfactory and works, and creativity or uniqueness are somewhat apparent.	Product is built to detailed standards, and it is of a quality that could be purchased by a consumer; the design is unique and demonstrates creativity.		
Product Functionality (X1)	Little specific functionality per the original specification is demonstrated.	The product meets some of the functionality per the original specification.	The end product exhibits functionality as per the original specifications.		
Tolerance of Example (X1)	Materials are not joined cleanly and are not consistent with working drawings.	Materials are somewhat joined cleanly and are fairly consistent with working drawings.	Materials are joined cleanly and are consistent with working drawings.		
PROTOTYPE SUBTOTAL (40 points)					

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

PRELIMINARY SUBTOTAL (110 points)	
--	--

SEMIFINAL PRESENTATION/INTERVIEW (70 points)					Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance		
	1-4 points	5-8 points	9-10 points		
Organization Use of audio/visual materials (X1)	Participants seem unorganized and unprepared for the presentation/interview; illogical explanation of the product is presented; team exhibits difficulty with the use of audio/visual materials.	Participants are generally prepared for the presentation/interview; explanation of the product is communicated and generally organized; audio/visual materials are used somewhat effectively.	The presentation/interview is logical, well organized, and easy to follow; explanation of the product is communicated in an organized and concise manner; the use of audio/visual materials is effective, organized, and logical.		
Knowledge (X2)	Participants seem to have little understanding of the concepts in their project; the presentation, does not clearly define the product; answers to questions may be vague.	Participants exhibit an understanding of the concepts in their project; the presentation is, for the most part, logical and/or clear.	Participants show clear evidence of a thorough understanding of the project; the presentation is concise and logical.		
Articulation (X1)	Communication of the project is unclear, unorganized, and or illogical; leadership and/or 21 st century skills are not evident.	Communication of the project is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the project is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.		
Integration of Theme (X2)	The current theme is not demonstrated in the product and/or the product is not realistic and functional.	The current theme is adequately demonstrated in the product, and the product is fairly realistic and functional.	The current theme is exceptionally well demonstrated in the product, and the product is extremely realistic and functional.		

SEMIFINAL PRESENTATION/INTERVIEW (70 points) – continued				
Delivery (X1)	The team is verbose and/or uncertain in its presentation/interview; participants' posture, gestures, and lack of eye contact diminish the presentation/interview.	The team is somewhat well-spoken and clear in its presentation/interview; participants' posture, gestures, and eye contact are acceptable in the presentation/interview.	The team is well-spoken and distinct in its presentation/interview; the participants' posture, gestures, and eye contact result in a polished, natural, and effective presentation/interview.	
SEMIFINAL PRESENTATION/INTERVIEW SUBTOTAL (70 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
SEMIFINAL SUBTOTAL (70 points)				
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.</p> <p>TOTAL (180 points)</p>				

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

MASS PRODUCTION

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stick-on labels for identifying entries
 - 5. Results envelope with coordinator forms
- B. Tape measure to determine the size of the product
- C. Display tables for entries
- D. Chairs for event coordinator and judges

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is scheduled to begin, meet with judges/assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

CHECK-IN

- A. Check in the entries at the time stated in the conference program.
- B. Participants check in:
 - 1. The documentation portfolio
 - 2. One (1) prototype
- C. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.
- D. In order to compete, participants must be on the entry list or must have approval of the CRC.
- E. Requirements for attire do NOT apply during check-in, only on the first day of the conference.
- F. Each entry must include the participant's identification number in the upper right-hand corner of the entry.

PRELIMINARY ROUND

- A. Position documentation portfolio and prototype for viewing by judges.
- B. Judges independently assess the entries.
- C. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry
 The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- D. Judges determine the twelve (12) semifinalists and discuss and break any ties.
- E. Submit semifinalist results to the CRC room.

SEMIFINAL ROUND

- A. Semifinalists report to the time and place stated in the conference program to sign-up for the presentation/interview.
- B. Two (2) team representatives must report at the assigned time and place stated in the conference program for the presentation/interview.
- C. Participants may bring and use audio/visual materials or a laptop for their presentation. Projectors and screens are not permitted.
- D. Manage the presentations/interviews.
- E. Judges independently assess the semifinal presentation/interview.
- F. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- G. Judges determine the ten (10) finalists and discuss and break any ties.
- H. Submit the finalist results and all related forms in the results envelope to the CRC room.
- I. If necessary, manage security and the removal of materials from the event area.

MECHANICAL ENGINEERING



OVERVIEW

Applying leadership and 21st century skills, participants design and build a mechanical device to solve the problem statement for the identified theme. Through device functionality, presentation, and documentation, the team members demonstrate their knowledge of mechanical engineering and the application of their research as a design element or inspiration for their mechanical device, while observing the annual theme. The theme will be posted on the [TSA website](#) under Competitions/Themes and Problems. Teams demonstrate and promote their work in a timed presentation.

ELIGIBILITY

One (1) team of three to six (3-6) individuals per chapter.

TIME LIMITS

PRELIMINARY ROUND

- A. Pre-built structures must be started and completed during the current school year.
- B. Participants are allowed:
 - 1. Three (3) minutes to set up for the demonstration
 - 2. Five (5) minutes for the actual demonstration
 - 3. Three (3) minutes for resetting the device to the starting point
 - 4. A deduction of five (5) points will be incurred for exceeding any time limit; teams will be stopped one (1) minute after exceeding the time limit.

SEMIFINAL

- A. Up to ten (10) minutes is allowed for the interview.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants access the annual theme posted on the [TSA website](#) under Competitions/Themes and Problems.

- B. Participants concentrate their efforts identifying and understanding the use of subsystems within a larger system. Participants conduct research on an engineering design process that inspires your design, and gather information about the uses and purposes of simple machines.
- C. Brainstorm ideas for possible solutions and formulate a design for a mechanical system.
- D. Prepare an oral presentation to further explain the team's research and solution

PRELIMINARY ROUND

- A. No more than three (3) team representatives report at the time and place stated in the conference program to check in:
 - 1. One (1) prototype of a mechanical device
 - 2. The documentation portfolio
- B. Upon check-in, entries are independently reviewed for safety hazards only.
- C. Each team signs up for a time to test the device.
- D. No more than three (3) team representatives report at the assigned time and place to demonstrate the mechanical aspects of their device.
- E. Judges evaluate the entry and its components.
- F. A list of twelve (12) semifinalist teams (in random order) is posted.

SEMIFINAL ROUND

- A. Participants report at the time and place stated in the conference program to sign up for an interview.
- B. Participants report at the assigned time and place for the interview, which last no more than ten (10) minutes.
- C. All entry materials must be picked up by no more than three (3) team members at the time and place stated in the conference program.
- D. Ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRELIMINARY ROUND

A. Documentation Portfolio:

1. Documentation materials (comprising “a portfolio”) are required and must be secured in a [clear front report cover](#) with the following single-sided, 8½" x 11" pages, in this order:
 - a. Title page with the event title, the conference city and state, the year, and the team/chapter ID number; one (1) page
 - b. Identification and explanation of engineering design process; up to six (6) pages
 - c. Explanation of usage of simple machines in solution for design efforts; pages as needed
 - d. Bill of Materials
 - e. Photographic verification of work
2. Mechanical Device/Display
 - a. Mechanical Device must fit within the size requirement published in the current year's problem/theme.
 - b. Must reflect and incorporate the theme, in addition to components of the engineering design process researched.

EVALUATION

PRELIMINARY ROUND

- A. The documentation portfolio
- B. The mechanical device
- C. The device demonstration

SEMIFINAL ROUND

- A. The interview

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Engineer
- Multimedia designer
- Product designer
- Small business owner

MECHANICAL ENGINEERING

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

-
- ☐ Documentation portfolio is present
☐ Mechanical device is present
☐ ENTRY NOT EVALUATED

DOCUMENTATION PORTFOLIO (50 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Portfolio (X1)	Portfolio is missing three (3) or more components, and it is unorganized; it is messy and of low quality.	Portfolio has most components, is somewhat organized, and exhibits decent quality.	All components are included and there is clear evidence of quality and organization.	
Engineering Design Process (X2)	The description of the engineering design process is unclear, unconvincing, and lacks project details.	The description of the engineering design process includes some project details and a basic explanation of steps in the design process.	The description of the engineering design process includes a full explanation of each step in the process; the description is defined, and detailed.	
Mechanical Device Drawings (X1)	Only one (1) drawing/sketch of the model is included with little to no labeling.	Two (2) or more drawings/sketches of the model are included and are labeled.	Detailed drawings/sketches of the entire device/model are provided and appropriately labeled.	
Bill of Materials (X1)	A Bill of Materials is included, but more than one (1) material is missing.	A Bill of Materials is included with one (1) material missing; Bill of Materials is generally organized.	A Bill of Materials is included; it includes all components and is organized.	
DOCUMENTATION PORTFOLIO SUBTOTAL (50 points)				

MECHANICAL DEVICE (30 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Device (X1)	The device it is poorly constructed and finished; it lacks creativity and imagination.	The device design is satisfactory and works, and creativity or uniqueness are somewhat apparent.	The device is of a quality that could be purchased by a consumer; the design is unique and demonstrates creativity.	
Product Functionality (X1)	The device meets some of the functionality per the original specification.	The product meets some of the functionality per the original specification.	The end product exhibits functionality as per the original specifications.	
Integration of Theme (X1)	The annual theme is not demonstrated in the device.	The annual theme is adequately demonstrated in the device.	The annual theme is well demonstrated in the device.	
MECHANICAL DEVICE SUBTOTAL (30 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
PRELIMINARY SUBTOTAL (80 points)				

SEMIFINAL INTERVIEW (60 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Organization (X1)	Participants seem unorganized and unprepared; an illogical explanation of the solution is given.	Participants are somewhat prepared; an explanation of the solution is communicated and generally organized.	The presentation/interview is logical, well organized, and easy to follow; the solution is communicated in a concise manner.	
Knowledge (X2)	Participants seem to have little understanding of the concepts in their project; answers to questions are vague.	Participants exhibit a general understanding of the concepts in their project.	Participants show clear evidence of a thorough understanding of the concepts in the project.	
Articulation (X1)	Communication of the solution is unclear, unorganized, and/or illogical; leadership and/or 21 st century skills are not evident.	Communication of the solution is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the solution is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
Delivery (X1)	The team is verbose and/or uncertain; participants' posture, gestures, and lack of eye contact diminish the presentation/interview.	The team is somewhat well-spoken and clear; participants' posture, gestures, and eye contact are adequate.	The team is well-spoken and distinct; participants' posture, gestures and eye contact result in a polished, natural, and effective presentation/interview.	
Team Participation (X1)	The majority of the delivery is made by one (1) member of the team; the partner(s) are disengaged from the presentation.	All team members are generally engaged in the process, although one (1) member may take on more responsibility than others.	All team members are actively involved in the presentation and responses to interview questions; there is a shared responsibility among the team members.	
SEMIFINAL INTERVIEW SUBTOTAL (60 points)				

TIME DEDUCTIONS

A five (5)-point deduction will be incurred for any time infraction.

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

SEMIFINAL SUBTOTAL (60 points)

To arrive at the **TOTAL** score, add any subtotals and subtract rules violation points, as necessary.

TOTAL (140 points)

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

MECHANICAL ENGINEERING EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more
- C. Assistants, two to three (2-3)

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stick-on labels for identifying entries
 - 5. Results envelope with coordinator forms
- B. Display tables for entries
- C. Tables and chairs for event coordinator and judges
- D. Tables and chairs for team presentations, as needed
- E. Stopwatches

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is being held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is to begin meet with judges and assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

CHECK-IN

- A. Check in the entries at the time stated in the conference program.
- B. Participants check-in:
 - 1. The documentation portfolio
 - 2. The mechanical device
- C. Check the entry for safety only.
- D. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.
- E. In order to compete, participants must be on the entry list or must have approval of the CRC.
- F. Requirements for attire do NOT apply during check-in, only on the first day of the conference.
- G. Secure the entries in the designated area.
- H. Each entry must include the participant's identification number in the upper right-hand corner of the entry.
- I. Create a sign-up sheet for product demonstrations.

PRELIMINARY ROUND

- A. Participants sign up for a time to demonstrate their device at check-in.
- B. Participants report at the assigned time and place stated in the conference program for the testing of the device.
- C. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry
 The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- D. Judges independently assess the entries to determine the twelve (12) semifinalists.
- E. Submit the semifinalist results to the CRC room for posting.
- F. Manage the pick-up of non-semifinalist entries.
- G. Create a semifinalist sign-up sheet for the interviews.

SEMIFINAL ROUND

- A. Prepare a list of five to ten (5-10) questions to be asked of all semifinalists.
- B. Semifinalists report at the time and place stated in the conference program to sign-up for an interview time.
- C. Semifinalists report at the assigned time and place for the interview.
- D. Manage the completion of the interviews.
- E. Judges determine the ten (10) finalists and discuss and break any ties.
- F. Submit the finalist results and all related forms in the results envelope to the CRC room.
- G. If necessary, manage security and the removal of materials from the area.

OVERVIEW

Applying leadership and 21st century skills, participants conduct research on a contemporary medical technology issue of their choosing, document their research and solution, and present their documentation through a static display. The entry may include student research or a re-creation or simulation of research performed by the scientific community. A student-designed model or prototype depicting an aspect of the issue will also be included in addition to the display. Semifinalists participate in an on-site a presentation.

ELIGIBILITY

Three (3) teams per state may participate.

TIME LIMITS

Up to ten (10) minutes is allowed for the presentation/ interview.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants choose a contemporary medical technology issue they would like to research.
- B. Participants concentrate their efforts researching the issue.
- C. Participants prepare the display and model/prototype according to the regulations.

PRELIMINARY ROUND

- A. No more than two (2) team representatives report at the time and place stated in the conference program to check in:
 1. The display
 2. The model/prototype
- B. Entries are reviewed by judges with neither students nor advisors present.
- C. A list of twelve (12) semifinalist teams (in random order) is posted.

SEMIFINAL ROUND

- A. One (1) team representative reports at the time and place stated in the conference program to sign-up for a presentation.
- B. Two to three (2-3) team representatives report at the assigned time and place for the presentation.
- C. Semifinalist team representatives present and may be asked questions by judges.
- D. Team representatives pick up their entry from the display area at the time and place stated in the conference program.
- E. Ten (10) finalists are announced during the conference award ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRE-CONFERENCE

- A. Participants must understand the fundamental concepts and principles of the contemporary medical technology issue they select. Research should focus on significant impacts (opportunities and risks) on the environment, economy, and society, as well as any important ethical considerations.
- B. The Display:
 1. Supporting materials should be exhibited in a creative and effective manner on a stand-alone display and should include at a minimum:
 - a. Team identification number.
 - b. Summary of the issue researched.
 - c. Societal impact, including economic, social, environmental and ethical considerations.
 - d. Supporting information such as logs, graphs, sketches, drawings, illustrations, and photographs

- e. The display must incorporate the use of design principles. Highlight your display with creative visual elements (e.g. photos, titles) to actively engage the audience. Participants may use images “labeled for reuse,” but must properly cite the source (refer to the [TSA website](#) under Levels and Rules).
- f. Copyright: Citation of all ideas, fonts, and images from sources other than the designer, and/or that are copyrighted (most fonts and images found on the web are copyrighted material unless purchased or offered as free-domain) and MUST be included in the documentation portfolio. Clip art must be documented; failure to do so results in disqualification.
- g. Written permission for all copyrighted material must be included in the documentation portfolio (see Forms Appendix).
- h. If the entry contains images of people, proof of consent must be included as a separate PDF file and submitted with the other required documentation. Images of minors require parental consent (see Forms Appendix).
- i. Photographic verification: photographic or digital images clearly displaying the model/prototype.
- j. The size of the display may not exceed 15" deep x 3' wide x 4' high.
- k. No viruses, live plants, or animals or harmful/illegal substances may be used as a part of the display.

C. The Model/Prototype:

- 1. Participants must create a model or prototype of the medical technology solution chosen.
- 2. Models/prototypes may be 3D printed or CNC manufactured.
- 3. Models may not be commercially purchased or obtained from a medical facility or other retail supplier.
- 4. A/C electricity may not be used.
- 5. Any power source used must fit within the maximum display area.
- 6. If operating instructions are necessary (including electronics), they must be clearly displayed.
- 7. Photographic verification of design and creation of the model or prototype must be included.
- 8. Dry cell or photo-voltaic cells may be used for power, if desired.

PRELIMINARY ROUND

- A. Once the display set-up time frame has elapsed, no one may re-enter the event area.
- B. Violation of the following will result in disqualification:
 - 1. No viruses, live plants, or animals may be used as a part of the display.
 - 2. No harmful or illegal substances may be displayed.

EVALUATION

PRELIMINARY ROUND

- A. The display
- B. The model/prototype

SEMIFINAL ROUND

- A. The presentation/interview

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Dietitian
- Doctor
- Medical technologist
- Nurse
- Pharmacist
- Prosthetics practitioner

MEDICAL TECHNOLOGY

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ Display is present
- ☐ Reference/Resource Page is included
- ☐ Model/prototype is present
- ☐ ENTRY NOT EVALUATED

DISPLAY (80 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Explanation of Impacts (X2)	Explanation is missing a discussion of the issue's relevance to environmental, economic, social, and/or ethical considerations.	Explanation addresses some of the issues relevant to environmental, economic, social, and/or ethical considerations.	Explanation includes a full discussion of the issue's relevance to environmental, economic, social, and/or ethical considerations.	
Supporting Information (X1)	Support information does not help to clarify the issue, and/or it is of little significance.	Support information is somewhat appropriate and helps provide some clarity to the issue.	Support information is highly effective and of excellent quality.	
Research, References, and Resources (X1)	Research is inadequate and/or very few credible sources are referenced.	Research is conducted appropriately, with some adequate credible sources.	A comprehensive research base that includes credible sources is evident.	
Communication of Issue (X1)	It is difficult to understand the issue being communicated; an illogical explanation presented.	The issue is communicated and thoughts are organized somewhat concisely.	The issue is communicated in an organized, clear, and concise manner.	
Communication of Solution (X1)	It is difficult to understand the solution being communicated; an illogical explanation is presented.	The solution is communicated and thoughts are somewhat organized.	The solution is communicated in an organized, clear, and concise manner.	
Creativity (X1)	The display lacks creativity; no, or very few, design principles are integrated in the display.	Some elements of creativity exist in the display, and essential design principles are generally evident.	The display exudes creativity; essential design principles and elements are well integrated.	
Aesthetics and Artisanry (X1)	Work is unorganized and sloppy; display seems to be an afterthought or thrown together.	Display generally depicts the issue.	Display is exemplary in logically communicating the issue.	
DISPLAY SUBTOTAL (80 points)				

MODEL/PROTOTYPE (40 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Model/Prototype (X1)	Model/prototype is present but not complete or is lacking in overall quality.	Model/prototype is present and is good quality but missing detail to adequately portray the project's focus.	Model/prototype is present and shows great detail in portraying the project's focus.	
Communication of Solution (X1)	It is difficult to understand the solution being communicated; an illogical explanation is presented.	The solution is communicated and thoughts are somewhat organized.	The solution is communicated in an organized, clear, and concise manner.	
Creativity (X1)	The model/prototype lacks creativity; no, or very few, design principles are integrated in the display.	Some elements of creativity exist in the model/prototype, and essential design principles are generally evident.	The model/prototype exudes creativity; essential design principles and elements are well integrated.	
Aesthetics and Artisanry (X1)	Work is unorganized and sloppy; model/prototype seems to be an afterthought or thrown together.	Model/prototype depicts a generally organized conceptualization of the issue.	Model/prototype is exemplary in logically communicating the issue.	
MODEL/PROTOTYPE SUBTOTAL (40 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				

PRELIMINARY SUBTOTAL (120 points)	
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SEMIFINAL PRESENTATION/INTERVIEW (60 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Organization (X1)	Participants seem unorganized and unprepared for the presentation, with an illogical explanation of the problem and solution.	Participants are generally prepared for the presentation; explanation of problem and solution are communicated and somewhat organized.	The presentation is logical, well organized, and easy to follow; the problem and solution are communicated in an organized and concise manner.	
Knowledge (X2)	Participants seem to have little understanding of the concepts in their project; answers to questions may be vague.	Participants exhibit an basic understanding of the concepts in their project.	Participants show clear evidence of a thorough understanding of the project.	
Articulation (X1)	Communication of the solution is unclear, unorganized, and or illogical; leadership and/or 21 st century skills are not evident.	Communication of the solution is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the solution is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
Team Participation (X1)	The majority of the presentation is made by one member of the team; partner(s) may be disengaged from the presentation.	Team members are generally engaged in the presentation, though one member may take on more responsibility than the other(s).	Team members are actively involved in the presentation and responses to questions; there is shared responsibility among team members.	

SEMIFINAL/INTERVIEW PRESENTATION (60 points) – continued				
Delivery (X1)	The team is verbose and/or uncertain in the presentation; participants' posture, gestures, and lack of eye contact diminish the presentation.	The team is somewhat well-spoken and clear in the presentation; participants' posture, gestures, and eye contact are acceptable in the presentation.	The team is well-spoken and distinct in its presentation; participants' posture, gestures, and eye contact result in a polished, natural, and effective presentation.	
SEMIFINAL/INTERVIEW PRESENTATION SUBTOTAL (60 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
SEMIFINAL SUBTOTAL (60 points)				
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.</p> <p>TOTAL (180 points)</p>				

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE
Printed name: _____ Signature: _____

MEDICAL TECHNOLOGY

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator, one (1)
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more
- C. Assistants for check-in, two (2)

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stick-on labels for identifying entries
 - 5. Results envelope with coordinator forms
- B. Measuring tape for judges
- C. Display tables for entries
- D. Table and chairs for event coordinator and judges

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, tables, chairs, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is scheduled to begin, meet with judges to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRELIMINARY ROUND

- A. Check in the entries at the time stated in the conference program.
- B. No more than two (2) team representatives set up and check in:
 - 1. The display
 - 2. The model/prototype
- C. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.
- D. In order to compete, participants must be on the entry list or must have CRC approval.
- E. Requirements for attire do NOT apply during check-in, only on the first day of the conference.
- F. Each entry must include the participant's identification number in the upper right-hand corner of the entry.
- G. Prior to judging, position displays for viewing if needed.
- H. Judges individually evaluate the entries.
- I. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry
 The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- J. Judges determine the twelve (12) semifinalists and discuss and break any ties.
- K. Submit the semifinalist results and all related forms in the results envelope to the CRC room.

SEMIFINAL ROUND

- A. Semifinalists report at the time and place stated in the conference program to sign-up for a presentation time.
- B. Semifinalists report at the assigned time and place for the presentation.
- C. Manage the presentations.
- D. If judges ask questions, they should be the same questions for each team for the purpose of comparing one team to another.
- E. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- F. Judges determine the ten (10) finalists and discuss and break any ties.
- G. Submit the finalist results and all related forms in the results envelope to the CRC room.
- H. If necessary, manage security and the removal of materials from the event area.

OVERVIEW

Applying leadership and 21st century skills, participants design a working digital device (product) with real-world applications. Through product demonstration and documentation, the team demonstrates in detail its knowledge of microcontroller programming, simple circuitry, and product design and marketing. The project should have educational and social value, and conform to the theme for the year. The theme will be posted on the [TSA website](#) under Competitions/Themes and Problems. Teams demonstrate and promote their work in a timed presentation.

ELIGIBILITY

One (1) team per chapter may participate; individual entries are permitted

TIME LIMITS

Participants are allowed:

- A. Five (5) minutes to set up for the presentation.
- B. Five (5) minutes for the presentation.
- C. Three (3) minutes for removal of any items.
- D. A deduction of five (5) points will be incurred for exceeding the five (5) minute presentation time limit.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants concentrate their efforts in the design and development of a working digital device (product).
- B. Participants create a portfolio, documenting their research and process.
- C. Participants prepare an oral presentation.

ON-SITE CHALLENGE

- A. No more than three (3) team representatives report at the time and place stated in the conference program with:
 - 1. The device (product)
 - 2. The documentation portfolio
- B. Participants are assigned a presentation time upon check-in.
- C. The three (3) team representatives present the following at their assigned time:
 - 1. Research findings
 - 2. An explanation of the value of their product
 - 3. A demonstration of the product's functionality
- D. Judges circulate to evaluate the entries and may ask questions after the presentation is finished.
- E. Judges score the entries and presentation.
- F. Ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRE-CONFERENCE

- A. Documentation Portfolio:
 - 1. Documentation materials (comprising "a portfolio") are required and must be secured in a [clear front report cover](#) with the following single-sided, 8½" x 11" pages, in this order:
 - a. Title page with the event title, the conference city and state, the year, and the team identification number; one (1) page
 - b. Table of contents; pages as needed
 - c. A description of the team's project, including an explanation of the educational and/or social value of the project; pages as needed

- d. Research into the problem; three (3) pages maximum
- e. A Plan of Work log (see Forms Appendix); one (1) page.
- f. Circuit diagrams; pages as needed
- g. Source code
- h. Materials list
- i. Team's evaluation of its work; pages as needed
- j. References and resources list in proper MLA format; pages as needed

B. The Device (product):

1. The device (product) must include a programmed microcontroller that controls the device functionality.
2. Aesthetics: The product must be well-designed and show good craftsmanship.
3. Functionality: The product must operate as intended; remote control technology may be used to operate the device.
4. Educational/Social Value: The product must have a level of educational and/or social value.
5. Marketability: The product should be marketable.
6. AC power and/or a dry cell battery may be used.

ON-SITE CHALLENGE

A. The Presentation:

1. Participants are given five (5) minutes to set up their device and five (5) minutes to explain the problem and demonstrate the functionality of the device.
2. A deduction of five (5) points will be incurred for exceeding the five (5)-minute presentation time limit.
3. Judges may ask questions after the presentation.
4. Participants are allowed three (3) minutes for the removal of any items used in the presentation.

B. All portfolios and presentations become the property of TSA and will not be returned after the event.

EVALUATION

- A. The product
- B. The documentation
- C. The presentation

Refer to the official rating form for more information.

ADDITIONAL RESOURCES

www.avr-tutorials.com

www.pictutorials.com/what_is_microcontroller.htm

www.newbiehack.com/MicrocontrollerTutorial.aspx

people.ece.cornell.edu/land/courses/ece4760/FinalProjects

www.circuitstoday.com/8051-projects-and-circuits

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Manufacturing
- Software engineer
- Technical writer

MICROCONTROLLER DESIGN

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ The documentation portfolio is present
☐ The device (product) is present
☐ ENTRY NOT EVALUATED

DOCUMENTATION PORTFOLIO (20 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Portfolio Components (X1)	Portfolio is unorganized, missing three (3) or more of the required components (such as circuit diagrams, source code, and marketing plan, etc.), and/or components are of poor quality.	Portfolio is somewhat organized, contains most components, and is of adequate quality.	Portfolio is organized and includes all required components.	
Research (X1)	Research is inadequate, and/or very few credible sources are referenced.	Research is adequate, and mostly credible sources are included.	The research is comprehensive, and credible resources are included.	
DOCUMENTATION PORTFOLIO SUBTOTAL (20 points)				

DEVICE (90 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Complexity (X2)	Product lacks complexity; it includes little or no code, and/or circuit design and control technology complexity.	The product exhibits some degree of complexity; it includes code, circuit design, and control technology complexity.	The product is complex and highly functional; it includes code, circuit design, and control technology complexity.	
Creativity (X2)	The product lacks creativity; very little original thought in developing the project is evident.	Some elements of creativity are expressed; the product is somewhat original.	The work exudes creativity; the product is highly original.	
Technical Skill (X2)	Little technical skill is exhibited in the code and circuit design.	A beyond-basic degree of technical skill is exhibited in the code and circuit design.	A level of mastery of coding and circuit design is exhibited.	
Effectiveness (X1)	Product does not appropriately provide a solution to the problem.	Product loosely provides a solution to the problem.	The solution to the problem is clear in the product.	

PRODUCT (90 points) – continued				
Educational and/or Social Value (X1)	Product does not have any, or has very little, educational and/or social value.	The product has adequate educational and/or social value.	The product has high social and educational value.	
Design Principles (X1)	Product demonstrates little to no use of design principles.	Product demonstrates adequate use of design principles	Product demonstrates exceptional use of design principles	
PRODUCT SUBTOTAL (90 points)				

PRESENTATION (40 points)				
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Organization (X1)	Participant(s) seem unorganized and unprepared for the presentation; the presentation is illogical.	Participant(s) are generally prepared for the presentation; explanation of the product is communicated and generally organized.	The presentation is logical, well organized, and easy to follow; explanation of the product is communicated in an organized and concise manner.	
Articulation (X1)	Communication of the product functionality and design process is unclear, unorganized, and or illogical; leadership and/or 21 st century skills are not evident.	Communication of the product functionality and design process is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the product functionality and design process is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
Product Demonstration (X2)	Participant(s) is/are unable to successfully demonstrate the product, and/or the product does not work, or barely works, as intended.	Participant(s) is/are able to partially demonstrate the functionality of the product; the product somewhat works as intended.	Participant(s) is/are successful and effective in the product demonstration; the product works exactly as intended.	
PRESENTATION SUBTOTAL (40 points)				

Record scores in the column spaces below.

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.	
Indicate the rule violated: _____	
Time violation (a deduction of five points total will be incurred for exceeding the five-minute presentation time limit). Record the deduction.	

PRELIMINARY SUBTOTAL (150 points)	
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To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.	TOTAL (150 points)	
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Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

MICROCONTROLLER DESIGN

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Results envelope with coordinator forms
- B. Chairs, one (1) per participant
- C. Stopwatch for timing presentations

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is being held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is scheduled to begin, meet with your judges/assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

ON-SITE CHALLENGE

- A. No more than three (3) team representatives report at the time and place stated in the conference program with:
 - 1. The device (product)
 - 2. The documentation portfolio
- B. Each entry must include the participant's identification number in the upper right-hand corner of the entry.
- C. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.
- D. In order to compete, participants must be on the entry list or must have approval of the CRC.
- E. Assign students a five (5)-minute time frame for their presentation at check-in.
- F. Judges circulate to review each static entry and conduct presentations at the designated time for each team.
- G. Presentations:
 - 1. Inspect the area in which the presentations are to be held.
 - 2. There must be seating for at least five (5) people at a table with space for a computer and a display.
 - 3. Conduct presentations.
 - 4. Judges may ask questions after the presentation.
 - 5. A deduction of five (5) points will be incurred for exceeding the five (5) minute time limit.
- H. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry

The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- I. Judges determine ten (10) finalists and discuss and break any ties.
- J. Submit the finalist results and all related forms in the results envelope to the CRC room.
- K. Manage security and the removal of materials from the area.

OVERVIEW

Throughout the world, people are working to become more self-sustaining when it comes to landscaping and architectural design. Sometimes the purpose is to live off the grid, other times it is to create a smaller carbon footprint; yet other times it is to meet a need in locations where there is not access to power, water, or other basics. There are many options for sustainability throughout the world, but sometimes a location limits or enables those options.

Applying leadership and 21st century skills, participants conduct research on a sustainable architectural design for a home in a country of the team's choosing other than the team's resident country. Teams will create a display and a model. The model can be of the home the team designs or of a specific aspect of their design. Semifinalists demonstrate competency by presenting and responding to questions about their design. The design brief for this competition will be posted on the [TSA website](#) under Competitions/Themes and Problems.

ELIGIBILITY

Three (3) teams per state may participate; individual entries are permitted

TIME LIMITS

The semifinal presentation/interview lasts a maximum of ten (10) minutes.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants access the design brief posted on the [TSA website](#) under Competitions/Themes and Problems.
- B. Participants select a country and design a sustainable home based on that country's climate conditions, raw materials available, construction methods, and infrastructure.

- C. Participants concentrate their efforts researching conditions in their chosen country and sustainability efforts.
- D. Participants prepare their documentation, display, and model according to the regulations.
- E. Participants prepare to present.

PRELIMINARY ROUND

- A. No more than two (2) team representative report at the time and place stated in the conference program to check in:
 1. The model
 2. The display
 3. The documentation portfolio
- B. Entries are evaluated by judges independently, with neither students nor advisors present based on the following criteria:
 1. Judges score the Model and Display criteria to determine the top twenty-four (24) preliminary contestants, which will not be posted.
 2. Judges score the Documentation Portfolio criteria of those top twenty-four contestants to determine the top twelve (12) semifinalist teams.
- C. A list of twelve (12) semifinalists (in random order) is posted.

SEMIFINAL ROUND

- A. No more than two (2) team representatives report at the time and place stated in the conference program to sign up for a presentation/interview time.
- B. Two to three (2-3) team representatives report at the assigned time and place stated in the conference program to participate in the presentation/interview.
- C. Judges score the presentation/interviews.
- D. Ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRE-CONFERENCE

- A. Participants must understand the fundamental concepts and principles of the sustainable architecture that they are implementing. Research should focus on the country's environment, climate, natural resources, and economy.
- B. Display and Model:
 1. The display must include:
 - a. Model of the solution or model of a system used for the design
 - b. The chosen country's name
 - c. A world map clearly indicating the location of the chosen country, the location of the current year's National TSA Conference, and the distance in miles between the two (2) locations
 - d. A tri-fold flyer or brochure that provides basic information and facts about the chosen country (one [1] piece of 8½" x 11" paper)
 - e. The team's documentation portfolio
 2. The size of the display and model may not exceed 15" deep x 3' wide x 4' high.
- C. Documentation Portfolio:
 1. Documentation materials (comprising "a portfolio") are required and must be secured in a [clear front report cover](#) with the following single-sided, 8½" x 11" pages, in this order:
 - a. Title page with the event title, the conference city and state, the year, and the team ID number; one (1) page
 - b. Table of contents; one (1) page
 - c. A description of how the team interpreted the design challenge and an explanation of the style and merits of the solution; two (2) pages
 - d. A description of the country's environment, climate, natural resources, and economy; three (3) pages
 - e. Building materials used in the construction of the home interior and exterior surfaces of the architectural design (this is different from the list of the model construction materials); one (1) page
 - f. CAD drawings for the required drawings (each drawing to be submitted on maximum drawing sheets cut size B [11" x 17"] with appropriate scale size noted on the drawing); pages as needed
 - i. Original floor plan/s of the design
 - ii. Landscape plan
 - iii. Diagrams explaining design elements
 - g. References and resources page in proper MLA format. Participants must cite a minimum of three (3) different types of credible resources; pages as needed
 - h. Plan of Work Log (see Forms Appendix)

PRELIMINARY ROUND

- A. No more than two (2) team representatives check in the entry and set up the display, observing the following:
 1. Models or prototypes must fit within the allotted display space
 2. A/C electricity is prohibited
 3. Dry cell or photo-voltaic cells may be used for power, if desired
 4. The power source used must fit within the maximum display area
 5. If operating instructions are necessary, they must be clearly displayed
- B. Violation of the following will result in disqualification:
 1. No viruses, live plants, or animals may be used as a part of the display.
 2. No harmful or illegal substances may be displayed.

SEMIFINAL ROUND

- A. Participants may reference the display and the portfolio. No additional materials or devices are allowed for the presentation.

EVALUATION**PRELIMINARY ROUND**

- A. The display
- B. The model
- C. The documentation portfolio

SEMIFINAL ROUND

- A. The presentation/interview

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Appraiser
- Architect
- Construction manager
- Interior designer
- Urban and regional planner

OFF THE GRID

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

-
- ☐ The documentation portfolio is present
- ☐ Display and model are within size requirements
- ☐ Drawings are present
- ☐ ENTRY NOT EVALUATED

DISPLAY (40 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Display Components (X1)	Display is unorganized and/or is missing three (3) or more components.	Display has most components and is generally organized; it has sufficient content.	All components are included in the display content and the organization is excellent.	
Communication of Solution (X1)	The description of the country and design is unclear or vague; there is little to no mention of the sustainable design features.	The description of the country and design of the style are included, however, some sustainable design features are missing.	The description of the country and design of the style are clear, effective, and convincing.	
Creativity (X1)	Display lacks originality; none or very few design principles are integrated in the display.	Some resourcefulness and ingenuity are evident in the display; some essential design principles are generally used.	There is clear evidence of an inventive, unique, and creative display; essential design principles and elements are integrated.	
Brochure (X1)	The brochure is missing or is not effective in communicating the solution to the challenge and the country chosen.	Most of the brochure is well designed and informative about the solution to the challenge and the country chosen.	The brochure effectively informs the reader of the solution to the challenge and the country chosen.	
DISPLAY SUBTOTAL (40 points)				

DOCUMENTATION PORTFOLIO (80 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Portfolio (X1)	Portfolio is unorganized and/or missing three (3) or more components.	Portfolio has most components and is generally organized; it has sufficient content.	All components are included in the portfolio; content and organization are excellent.	
Description of Design Interpretation (X1)	The description of the design and style is unclear or vague; includes little or no mention of the sustainable design features.	The description of the design and explanation of the style are included; they are adequately presented.	The descriptions and merits of the design, and an explanation of the style are clear, effective, and convincing.	

DOCUMENTATION PORTFOLIO (80 points) – continued				
Description of the Chosen Country (X1)	There is little or no evidence of research done; the country's environment, climate, natural resources, and economy were not addressed clearly or at all.	Most, but not all, of the required areas of research are present and documented; some aspects are missing.	All of the research area are clearly documented and well presented.	
Building Materials (X1)	Many elements are missing or incomplete.	Most, but not all, elements are included.	All elements are included, and are detailed and explained clearly.	
Drawings (X2)	A few of the required drawings are present, but they are lacking in quality.	Most, but not all, of the required drawings are included and are in the proper format.	All required drawings are included and in the proper format.	
Resources/References (X1)	There is little to no effort to provide resources or references.	Resources and references are included and are somewhat credible.	There is clear evidence of the appropriate use of applicable resources and references.	
Plan of Work Log (X1)	The Plan of Work log lacks major elements of documentation.	The Plan of Work log is somewhat complete, and generally reflects the time and work necessary for the project.	The Plan of Work log completely and accurately reflects the time and work necessary for the project.	
DOCUMENTATION PORTFOLIO SUBTOTAL (80 points)				

MODEL DESIGN (50 points)				
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	Record scores in the column spaces below.
	1-4 points	5-8 points	9-10 points	
Effectiveness of Design (X1)	The design is ineffective in meeting the needs of the challenge.	The design is somewhat effective in meeting the needs of the challenge.	The design is clearly effective in meeting the needs of the challenge.	
Aesthetic Appeal and Functionality (X1)	There is little to no evidence of consideration of aesthetics and curb appeal in the design; systems in the model do not match or work with the design.	There is some evidence that aesthetics and curb appeal have been considered in the design; most systems in the model match or work with the design.	There is clear evidence that aesthetics and curb appeal are fully and effectively integrated into the design; all systems in the model work with the design.	
Creativity and Innovation (X1)	The design lacks originality and exhibits few, if any, creative and/or innovative applications.	Some unique, innovative, and creative concepts are incorporated in the overall design.	Unique, creative, and innovative approaches are fully incorporated into the design.	
Model Design (X2)	The model is not informative and does not effectively nor accurately represent the design.	Most of the model is informative and accurately represents the design.	The model effectively displays the solution to the challenge and accurately represents the design.	
MODEL DESIGN SUBTOTAL (50 points)				

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

PRELIMINARY SUBTOTAL (170 points)	
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SEMIFINAL PRESENTATION/INTERVIEW (50 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Organization (X1)	Participant(s) seem unorganized and unprepared for the interview; illogical explanation of the problem and solution is presented.	Participant(s) is/are generally prepared for the interview; explanation of the problem and solution are generally communicated.	Interview is logical and easy to follow; the problem and solution are communicated in a concise manner.	
Articulation (X1)	Communication of the design project is unclear, unorganized, and or illogical; leadership and/or 21 st century skills are not evident.	Communication of the design project is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the design project is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
Delivery (X1)	The participant(s) is/are verbose and/or uncertain in its interview; participants' posture, gestures, and lack of eye contact diminish the interview.	The participant(s) is/are somewhat well-spoken and clear in its interview; participants' posture, gestures, and eye contact are acceptable in the interview.	The participant(s) is/are well-spoken and distinct in its interview; participants' posture, gestures, and eye contact result in a polished, natural, and effective interview.	
Knowledge (X2)	Participant(s) exhibit little understanding of the concepts in their project; answers to questions may be vague.	Participant(s) exhibit a general understanding of the concepts in their project.	Participant(s) show clear evidence of a thorough understanding of the project.	
SEMIFINAL PRESENTATION/INTERVIEW SUBTOTAL (50 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
SEMIFINAL SUBTOTAL (50 points)				
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.</p> <p>TOTAL (220 points)</p>				

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

OFF THE GRID

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more
- C. Assistants for check-in, two (2)

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stick-on labels for entries, as needed
 - 5. Results envelope with coordinator forms
- B. Tables for entries
- C. Tables and chairs for event coordinator and judges

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is being held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is scheduled to begin, meet with judges/assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

EVENT CHECK-IN

- A. Check in participants at the time and place stated in the conference program.
- B. No more than two (2) participants check in:
 - 1. The model
 - 2. The display
 - 3. The documentation portfolio
- C. Ensure the model and display does not exceed: 15" deep x 3' wide x 4' high.
- D. Check to make sure the entry does NOT include:
 - E. Viruses, live plants, or animals
 - F. Harmful or illegal substances.
- G. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.
- H. In order to compete, participants must be on the entry list or must have approval of the CRC.
- I. Requirements for attire do NOT apply during check-in, only on the first day of the conference.
- J. Place a team identification number stick-on label in the lower right-hand corner of each display.
- K. Secure the entries in the designated area.

PRELIMINARY ROUND

- A. Judges independently assess the entries.
- B. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry
 The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- C. Judges determine twelve (12) semifinalists and discuss and break any ties.
- D. Submit semifinalist results to the CRC for posting.
- E. Create an interview/presentation sign-up sheet.

SEMIFINAL ROUND

- A. Two to three (2-3) team representatives report at the assigned time and place to sign-up for the presentation/interview.
- B. Two to three (2-3) team representatives report at the assigned time and place for the presentation/interview.
- C. Participants may reference the display and the portfolio. No additional materials or devices is allowed for the presentation.
- D. Judges review the presentation and ask pertinent interview questions.
- E. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- F. Judges determine the ten (10) finalists and discuss and break any ties.
- G. Submit the finalist results and all related forms in the results envelope to the CRC room.
- H. Manage security and removal of all materials from the area.

PREPARED SPEECH



OVERVIEW

Applying leadership and 21st century skills, participants prepare for and deliver a speech that reflects the theme of the current National TSA Conference. See the [TSA website](#) under Competitions/Themes and Problems for the current conference theme.

ELIGIBILITY

Three (3) individuals per state may participate.

TIME LIMITS

- A. Each speech should be no less than three (3) minutes and no more than five (5) minutes.
- B. A one (1)-point deduction will be incurred for each ten (10)-second interval under or over the allotted time for speaking.

ATTIRE

TSA competition attire is required.

PROCEDURE

- A. Participants report at the time and place stated in the conference program to sign up for a presentation time.
- B. Participants report at the assigned time and place for the presentation.
- C. The event coordinator introduces each student identification number only and in the order of scheduled times.
- D. Participants deliver their speech in the allotted time limit.
- E. Ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

- A. The speech must be the result of the participant's own efforts.
 - B. The annual topic for the Prepared Speech event may be found on the [TSA website](#) under Competitions/Themes and Problems.
 - C. Participants are not permitted to use any type of props, computers, display boards, etc.
 - D. Costumes are not permitted.
 - E. Participants may use note cards during the speech.
 - F. Participants may not reveal their school, chapter name, or city, but the appearance of a state name on an official TSA badge is acceptable.
 - G. TSA will provide a podium in the event room.
 - H. If observers are allowed in the presentation room during the presentations, the following shall be observed:
 - 1. No talking or gesturing is permitted.
 - 2. Observers are NOT allowed to enter or leave during a presentation.
 - 3. There is no applause until the presentation has concluded.
 - 4. No form of visual recording (such as photographic or video) or audio recording by any observer (including family, friends, or advisors of the participants) is permitted.
- Please refer to the conference page of the TSA website or the Spectator Events page of the conference program for additional information.
- I. Participant scores are penalized one (1) point per ten (10)-second interval for speaking over or under the allotted time.
 - J. Time commences when the speech begins.

EVALUATION

- A. The speech
- B. The speaker's stage presence

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Entertainment/television broadcaster
- Lawyer
- Politician
- Speech writer
- Teacher/trainer

PREPARED SPEECH

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

☐ ENTRY NOT EVALUATED

CONTENT (30 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Introduction (X1)	Introduction is weak, with little effort made to highlight the theme and/or to generate interest and enthusiasm for the topic.	Effort is evident; introduction creates a moderate level of interest.	Introduction is effective, stimulating, and engaging.	
Body (X1)	Body of speech is poorly organized; content does not properly cover or represent the concepts being presented.	Body of speech is adequately presented and is somewhat interesting.	Body of speech is clearly and effectively presented in an exceptionally interesting manner; the speech is memorable.	
Conclusion (X1)	Conclusion fails to summarize or clearly clarify the information presented in the speech.	Conclusion generally summarizes the content and theme of the speech.	The conclusion is effective, interesting, and memorable; it fully brings finality to the speech.	
CONTENT SUBTOTAL (30 points)				

STAGE PRESENCE (30 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Appearance (X1)	Participant's appearance is unprofessional, sloppy, and/or inappropriate.	Participant's appearance is adequate and appropriate.	Participant's appearance is clearly exceptional, appropriate, and professional.	
Confidence (X1)	Participant appears nervous during speech; poor posture, poor eye contact, and lack of confidence are evident; participant reads speech from note cards.	Participant is generally poised, displays eye contact, and is confident, with little sign of nervousness; participant's use of note cards to deliver the speech somewhat detracts from the overall speech.	Participant "commands" the room, and is exceptionally poised, confident, and positive; participant does not use note cards for the speech, or note cards do not detract from the overall speech.	

PREPARED SPEECH

STAGE PRESENCE (30 points) – continued					
Articulation (X1)	Participant conveys an inconsistent use of proper grammar, word pronunciation, acceptable pitch, and tone; leadership and/or 21 st century skills are not evident.	Participant generally uses proper grammar and pronunciation, and varies the tone and pitch in the delivery; leadership and/or 21 st century skills are somewhat evident.	Smooth and effective articulation, proper grammar, correct pronunciation, and varied tone and pitch are used throughout the speech; leadership and/or 21 st century skills are clearly evident.		
STAGE PRESENCE SUBTOTAL (30 points)					

ORGANIZATION (30 points)					Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance		
	1-4 points	5-8 points	9-10 points		
Effectiveness and Quality of Presentation (X1)	Speech is poorly prepared, not interesting, and not representative of the stated theme.	Speech is adequate in most areas but exceptional in none of them.	Speech is exceptional and memorable; the observer can easily understand and relate to the speech.		
Knowledge of Material (X1)	Minimal factual support is evident in the speech; the content of the speech does not relate to the theme; the participant does not convey understanding of the theme.	Factual support is provided in the speech, but the support does not always relate to the theme or match the content of the speech.	Factual support is provided in the speech; it has a strong relationship to the theme and enhances the content of the speech.		
Organization (X1)	The speech is difficult to follow or understand.	The speech is adequately organized and delivered.	The speech is clearly organized and easy to follow; the delivery is exceptional.		
ORGANIZATION SUBTOTAL (30 points)					

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.	
Indicate the rule violated: _____	

SEMIFINAL SUBTOTAL (90 points)	
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TIME DEDUCTIONS	
One (1) point per ten (10)-second interval is deducted for speaking under three (3) minutes or over five (5) minutes. Time commences when the competitor begins speaking.	
TOTAL TIME FOR SPEECH	
TOTAL TIME DEDUCTIONS	

Record scores in the column spaces below.

To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.	TOTAL (90 points)	
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Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

PREPARED SPEECH EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) per heat room
 - 2. Semifinal round, two (2) or more
- C. Timekeeper, one (1)
- D. Coordinator assistant (to serve as an escort from the holding area to the heat rooms), one (1)

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. One (1) stopwatch for each event room
 - 5. Results envelope with coordinator forms
- B. Podium
- C. Chairs for audience
- D. Tables and chairs for two (2) or more judges

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area or room in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.

- E. At least one (1) hour before the event is scheduled to begin, meet with judges/assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

ON-SITE CHALLENGE

- A. The event coordinator takes the first participant to the event room.
- B. The event coordinator or assistant introduces the participant by entry number only. No name tags or clothing identifying the hometown, school, or chapter of the participant are allowed. A state name on a TSA patch is acceptable.
- C. Approximately every eight to ten (8-10) minutes, the event coordinator or the coordinator assistant escorts another participant to the event room.
- D. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry

The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- E. Judges determine the ten (10) semifinalists.
- F. Submit the finalist results and all related forms in the results envelope to the CRC room.
- G. If necessary, manage security and the removal of materials from the event area.

PROBLEM SOLVING



OVERVIEW

Participants apply leadership and 21st century skills in problem solving to develop a finite solution to a stated problem provided on-site. Participants work as a team to provide the best solution, which is measured objectively.

ELIGIBILITY

One (1) team of two (2) individuals per chapter may participate.

TIME LIMITS

Two (2) hours for the design and construction of the solution are permitted.

ATTIRE

TSA competition attire is required.

PROCEDURE

ON-SITE CHALLENGE

- A. Participants report to the event area at the time and place stated in the conference program.
- B. The problem, the evaluation criteria, and the materials are distributed.
- C. Participants are allowed two (2) hours for the design and construction of a solution.
- D. Each solution is tested as soon as possible after the construction phase is completed. Some problems may require teams to be present for testing.
- E. Ten (10) finalists are announced at the awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

- A. All work must be completed in the event area during the time specified for the event.
- B. Specific materials related to the on-site problem is provided by TSA.
- C. Only the materials issued to each team by the event coordinator may be used in the development of the solution. Note: Exceptions are Adhesives (glue) and masking tape from each team's toolkit.
- D. Participants are required to provide their own tool box/container, which must:
 1. Include identification (school name, address, and advisor cell phone number).
 2. Not exceed twenty (20) inches (508 mm) length x ten (10) inches (254 mm) width x ten (10) inches (254 mm) height.
 3. Contain all tools and materials needed to fabricate the solution. The following is a suggested list:
 - a. Cutting devices; NONE may be electric
 - b. Adhesives:
 - i. Aerosol and electric applicators are not allowed
 - ii. A bottle of Uncure or Debonder is recommended
 - c. Temporary fastening devices
 - i. Straight pins
 - ii. Clamps
 - iii. Tape (only masking tape may be used as construction material, all other tape may only be used as a temporary fastening or hold down device)
 - d. A cutting surface that prevents table-top marring (required)
 - e. Rulers, straightedges, and/or measuring scales
 - f. Abrasives sheets, sponges, boards
 - g. Marking devices (pens, pencils, etc.) and sharpener
 - h. Sheet of wax paper, as large as is needed for the competition (required)

- i. Pliers, wrenches, nut drivers, as needed
 - j. Safety glasses and side shields, as required
 - k. One (1) roll masking tape no wider than $\frac{3}{4}$ "
- E. Participants without a tool box will not be allowed to compete.
- F. Sharing tools between teams is not permitted.
- G. Participants are required to provide and wear safety-approved eyewear for this event.
- 1. Safety eyewear shall be worn at event check-in.
 - 2. Prescription eyewear needs to have side shields to be considered safety eyewear.
 - 3. Should a team member remove his/her eyewear, he/she will be reminded once to replace it. If there is a second infraction, the team will be disqualified.
 - 4. Sunglasses are not suitable eyewear.

EVALUATION

- A. Each team's solution is evaluated objectively.
- B. A finite measure, such as elapsed time, horizontal or vertical distance, and/or strength, is used to determine the best solution.
- C. Ties shall be broken according to the entry with the earlier testing time given the advantage.

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Computer network specialist
- Detective
- Mechanical engineer
- Nurse
- Project manager

PROBLEM SOLVING

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ Safety eyewear is present
- ☐ The toolkit is present and meets the size requirements
- ☐ ENTRY NOT EVALUATED

TESTING OF SOLUTION (60 points)

Evaluation: A finite unit of measure, such as elapsed time, linear distance, and/or strength, etc. is used to determine ranking for this event.

1st: 60 Points	2nd: 55 Points	3rd: 50 Points	4th: 45 Points	5th: 40 Points	6th: 35 Points
7th: 30 Points	8th: 25 Points	9th: 20 Points	10th: 15 Points	11th: 10 Points	12th: 5 Points

TESTING OF SOLUTION SUBTOTAL (60 points)

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.

TOTAL (60 points)

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

PROBLEM SOLVING EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges, two (2) or more
- C. Timekeeper/monitors, one (1) or more

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Pre-populated flash drives for judges, if applicable
 - 5. Stick-on labels for identifying entries
 - 6. Copies of the tool template, as needed
 - 7. Stopwatch
 - 8. Results envelope
- B. A well-written, technologically appropriate problem that can be objectively measured; one (1) for each team
- C. Adequate conditions (inside or outside), on-site problem materials, monitoring, and testing devices for the designated problem
- D. Tables and chairs for participants
- E. Tables and chairs for event coordinator and judges

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area or room in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is scheduled to begin, meet with judges/assistants to review time limits, procedures, regulations, evaluation, and

all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

ON-SITE CHALLENGE

- A. Distribute materials as appropriate, prior to the start of the event.
- B. Begin the event at the scheduled time by closing the doors and checking the entry list.
- C. All participants and judges should be in the room at this time.
- D. Late participants and/or entries are considered on a case-by-case basis and only when lateness is caused by events beyond the participant's control.
- E. In order to compete, participants must be on the entry list or must have approval of the CRC.
- F. Each team submits their toolbox to the coordinator and judges for size verification.
- G. Once teams are seated (checked against the entry list) and general announcements have been made, the event problem is distributed, reviewed, and time is started.
- H. Judges and monitors observe the entire construction phase, with judges measuring solutions as soon as appropriate.
- I. Judges collect the solution design when the team's solution is submitted for testing.
- J. Judges use the designs to break any ties.
- K. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry

The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- L. Judges determine (10) finalists.
- M. Submit the finalist results and all related forms in the results envelope to the CRC room.
- N. If necessary, manage security and the removal of materials from the event area.

PROMOTIONAL MARKETING



OVERVIEW

Applying leadership and 21st century skills, participants create a marketing portfolio observing the theme and required elements, which will be electronically submitted pre-conference. The theme will be posted on the [TSA website](#) under Competitions/Themes and Problems. Semifinalists design a solution to an on-site challenge.

ELIGIBILITY

One (1) individual per chapter is allowed to participate.

TIME LIMITS

PRE-CONFERENCE

- A. All components of the chapter's entry must be finished, submitted, and accessible via the Internet by 11:59 p.m. ET on May 15th.
- B. Entries received, or changes made to submitted entries after this deadline will not be judged.
- C. Email verification of each team's entry will be made by June 10th.

SEMIFINAL ROUND

- A. Fifteen (15) minutes is allowed to set up.
- B. One (1) hour is allotted to complete, save, and submit the on-site problem.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants access the annual theme and on the [TSA website](#) under Competitions/Themes and Problems.
- B. Participants concentrate their efforts in creating a three (3)-part marketing portfolio containing:
 - 1. A printable advertisement
 - 2. A wearable design
 - 3. Digital signage

- C. Participants submit the printable advertisement and wearable design electronically as multi-page PDF documents separated into the following categories:
 - 1. The printable advertisement and supporting documentation for the design
 - 2. Wearable sign and supporting documentation for the design
- D. Participants submit the digital signage part of the marketing portfolio via a URL link.
- E. All components of the chapter's entry must be finished, submitted, and accessible via the Internet by 11:59 p.m. ET on May 15th.
- F. Submission information will be provided on the [TSA website](#) under Competition Updates.

PRELIMINARY ROUND

- A. A list of twelve (12) semifinalist teams (in random order) is posted on-site on the first full day of conference.

SEMIFINAL ROUND

- A. Semifinalists report at the time and place stated in the conference program with a computer, a power strip/surge protector, and an extension cord.
- B. The coordinator distributes TSA approved USB flash drives to the semifinalists.
- C. Semifinalists complete the on-site layout and design problem within the one (1)-hour time limit.
- D. Semifinalists save their final entry to the USB flash drive for submission.
- E. Ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRE-CONFERENCE

- A. The required elements are posted on the website under Competition/Themes and Problems.
- B. Pre-conference, participants design the following three (3) components as part of the Marketing Portfolio:
 1. Printable signage to include, but not limited to:
 - a. National TSA logo
 - b. City and state of the current year's National TSA Conference
 - c. Date, place, time and other details of the event
 - d. Must be viewable and saved as a PDF.
 2. Participants design a wearable design based on the theme and requirements posted on the [TSA website](#) under Competitions/Themes and Problems. This design must be viewable and saved as a PDF.
 3. Participants create digital signage using presentation software, and should include:
 - a. National TSA logo
 - b. Date, place, time and other pertinent details of the event
 - c. The digital signage must be between two to two and one half (2–2½) minutes in duration.
 - d. A URL link must be provided for submission, which points directly to the team's entry.
 4. The TSA logo can be used only in accordance with trademark policies that appear on the [TSA website](#) under "Resources > Toolkit".
- C. Additional information about design work needs to be a typed PDF file submitted with the corresponding design PDF file, and include the following:
 1. Notation of all ideas, fonts, and images that are completely original.
 2. Citation of all ideas, fonts, and images from sources other than the designer, and/or that are copyrighted (most fonts and images found on the web are copyrighted material unless purchased or offered as free-domain).

3. Written permission for all copyrighted material must be included. (See Student Copyright Checklist in the Forms Appendix).
4. Notation of the type of software program(s) used for designs and layout.
5. If the entry contains images of people, proof of consent must be included as a separate PDF file and submitted with the other required documentation. Images of minors require parental consent. (See Photo/Film/Video Consent and Release in the Forms Appendix).
- D. All components of the chapter's entry must be finished, submitted, and accessible via the Internet by 11:59 p.m. ET on May 15th.
- E. The submission must point directly to the individual's entry. Entries that require a request for access be granted will not be judged.

SEMIFINAL ROUND

- A. Participants are required to bring:
 1. A computer with software (a laptop computer is recommended)
 2. A power strip/surge protector
 3. An extension cord
 4. No printer is needed
 5. A USB thumb drive; the USB and all entries become property of TSA and will not be returned.
- B. Clip art may be used for the on-site problem, but the use of a template is not permitted. Students are responsible for providing their own graphic library.
- C. The on-site work must be an original creation.
- D. Internet access is permitted, but it will not be provided by TSA. TSA cannot guarantee the availability of cellular and/or Wi-Fi signals in the competition room.
- E. Participants may leave the room only with permission from the event coordinator.
- F. Students save the design solution for the on-site problem on the USB for submission.

EVALUATION

- A. The marketing portfolio
- B. The design challenge

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Ad copy writer
- Telecommunications manager
- Internal communications manager
- Volunteer manager
- Public affairs specialist

PROMOTIONAL MARKETING

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

☐ The entry was submitted and scored

☐ ENTRY NOT EVALUATED

PRINT DESIGN (50 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Layout and Design (X1)	Layout/design does not resemble a promotional poster, is not the correct size, and/or it is missing essential elements.	Most elements of design are followed; the design is the correct size, and few mistakes are made in the layout.	Poster encompasses all standardized layout practices, and creativity is at the forefront of the design.	
Content (X1)	Poster is missing three (3) or more of the following elements: Conference city/state and year, TSA logo, time, place, date and cost of the event.	Poster is missing one to two (1-2) elements listed in the minimal criteria.	All elements are included in the poster.	
Effectiveness (X1)	Poster does not convey intended message, and/or it contains unrelated text/graphics.	Poster generally conveys the intended message, and contains topic-related text/graphics.	Poster message is easily understood and interpreted, with exceptional use of related graphics and text.	
Incorporation of Graphic Design Principles (X2)	Design principles (alignment, consistency, contrast, unity, white space) are not incorporated adequately into the poster, and/or they are considered as an afterthought.	Poster exhibits incorporation of most design principles (alignment, consistency, contrast, unity, white space), and the overall layout is aesthetically pleasing.	Poster is aesthetically pleasing, and all design principles are well incorporated into the design and layout.	
PRINT DESIGN SUBTOTAL (50 points)				

WEARABLE DESIGN (50 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
First Impression (X1)	The design is sloppy, and/or it is difficult to see; there is poor choice of colors; the artwork is not suited for a wearable item, and/or it leaves an unfavorable impression.	The design has good points, but some details may detract from the overall quality.	The design is eye catching; attention to detail is obvious.	
Dominance (X1)	Eyes are drawn away from what should have been the focal point by some other component of the graphic.	A general attempt is made to use a graphic component that draws attention to the design's main idea.	The design's main components draw eyes to the appropriate location and/or focal point of the graphic.	
Use of Fonts/Words in Design (X1)	Fonts/words are not readable; location or size are not appropriate for the design.	Fonts/words are mostly appropriate, but there is room for improvement.	Fonts/words, their size, and their location are clearly appropriate for the design.	
Incorporation of Graphic Design Principles (X2)	Design principles (alignment, consistency, contrast, unity, white space), are not incorporated adequately into the graphic, and/or they are considered as an afterthought.	Graphic incorporates most design principles (alignment, consistency, contrast, unity, white space), and the overall layout is somewhat aesthetically pleasing.	Graphic is aesthetically pleasing, and all design principles are well incorporated into the design and layout.	
WEARABLE DESIGN SUBTOTAL (50 points)				

DIGITAL SIGNAGE (50 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Layout and Design (X1)	Signage lacks the use of design principles (alignment, consistency, contrast, unity, white space, color scheme) and presentation formatting (animations, transitions, and timings).	Signage contains some design principles and presentation formatting.	Excellent use of formatting to develop the design and layout of the presentation is evident.	
Audience (X1)	Audience is not considered in the development of the signage; inadequate language is used.	Tone and language are of average quality for the audience.	The signage is written specifically for an audience, with professional tone and language.	
Sentence Structure (X1)	Simple sentence structure is used throughout the signage, and there are multiple grammatical errors.	Writing is generally engaging and informative; only a few grammatical errors are evident.	Signage is well-written with little to no grammatical errors evident.	
Content (X1)	Signage is missing three or more of the required elements.	Signage is missing one or two of the required elements.	All elements are included in the signage.	
Effectiveness (X1)	Signage does not convey intended message appropriately, and/or it contains unrelated text/graphics.	Signage conveys overall intended message, but it contains some inadequate and/or unrelated text/graphics.	The message of the signage is easily understood and interpreted, with exceptional use of related text/graphics.	
DIGITAL SIGNAGE SUBTOTAL (50 points)				

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

Record scores in the column spaces below.				
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PROMOTIONAL MARKETING

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stick-on labels for identifying entries
 - 5. On-site problem for semifinalists, twelve (12) copies
 - 6. Results envelope with coordinator forms
 - 7. At least twelve (12) TSA approved USB's for the on-site challenge
- B. Tables, one (1) per participant
- C. Chairs, one (1) per participant

RESPONSIBILITIES

PRE-CONFERENCE

- A. National TSA will collect entries until 11:59 p.m. ET on May 15th and send out receipt confirmations to participants by June 10th. The results are shared with the CRC manager, event coordinator, and assigned judges
- B. Review entries as they are submitted to the designated online storage utility
- C. Manage communication and pre-conference evaluation (at least two [2] or more judges should be recruited earlier in the year). Coordinate with the Judge Manager.
- D. Judges determine the twelve (12) semifinalists and discuss and break any ties.
- E. Results are posted on-site at the national conference on the first full day.

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area or room in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is scheduled to begin, meet with judges/assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRELIMINARY ROUND

- A. On the first full day of the conference, post a list of the twelve (12) semifinalists in random order.

SEMIFINAL ROUND

- A. At the designated time, check-in the semifinalists and monitor them as they set up their work area.
- B. Label the TSA approved USB's with the semifinalists' student ID numbers.
- C. Distribute semifinalist participant TSA-approved USB flash drives.
- D. Provide the on-site problem.
- E. Supervise the one (1) hour on-site layout and design problem.
- F. Manage the evaluation process of the on-site problem.
- G. After the evaluation, supervise the removal of computers by the participants and collect the USB entries.

H. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:

1. To deduct twenty percent (20%) of the total possible points in this round
2. To disqualify the entry

The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.

- I. Judges determine the top ten (10) finalists and discuss and break any ties.
- J. Submit the finalist results and all related forms in the results envelope to the CRC room.
- K. If necessary, manage security and the removal of materials from the event area.

OVERVIEW

Applying leadership and 21st century skills, participants use computer graphics tools and design processes (i.e., animation) to communicate, inform, analyze and/or illustrate a topic, idea, subject, or concept that focuses on one (1) or more of the STEM (science, technology, engineering, or mathematics) areas. Sound may accompany graphic images. Participants will find the annual theme posted on the [TSA website](#) under Competitions/Themes and Problems. Semifinalists demonstrate proficiency through a presentation.

ELIGIBILITY

Three (3) teams per state may participate.

TIME LIMITS

PRELIMINARY ROUND

- A. All components of the chapter's entry, must be finished, submitted, and accessible via the Internet by 11:59 p.m. ET on May 15th.
- B. Entries received or changes made to submitted entries after this deadline will not be judged.
- C. Email verification of each team's entry will be made by June 10th.
- D. The animation is not to exceed three (3) minutes in length.
- E. There will be a three (3)-point deduction for each fifteen (15) seconds, or fraction thereof, over the three (3)-minute length.
- F. The animation time is calculated from the start of the first image or sound to the end of the last image or sound.

SEMIFINAL ROUND

- A. Ten (10) minutes is allowed for the presentation.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants access the annual theme posted on the [TSA website](#) under Competitions/Themes and Problems.
- B. Participants concentrate their efforts in the design and creation of a STEM animation video and documentation portfolio.
- C. Participants submit the entry by 11:59 p.m. ET on May 15th.
- D. Submission information will be provided on the [TSA website](#) under Competition Updates.

PRELIMINARY ROUND

- A. A list of twelve (12) semifinalist teams (in random order) is posted on-site on the first full day of conference.

SEMIFINAL ROUND

- A. No more than two (2) team representatives report at the time and place stated in the conference program to sign-up for a presentation.
- B. Two (2) team representatives report at the assigned time and place for the presentation.
- C. Judges score the presentations.
- D. The top ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRELIMINARY ROUND**A. Documentation Portfolio:**

1. Documentation materials (comprising a "portfolio") are required and must be submitted as a multi-page PDF document with pages in this order:
 - a. Title page with the event title, the conference city and state, the year, and the team ID number; one (1) page
 - b. Table of contents; pages as needed
 - c. Purpose of animation; one (1) page
 - d. Images of a hand-sketched storyboard that documents the flow and progression of the animation, with written notes; special effects, audio cues, dialogue, transitions, and scene duration should be incorporated into the storyboard; pages as needed.
 - e. Written description of what the animation illustrates or demonstrates; one (1) page
 - f. References and resources page in proper MLA format; pages as needed
 - g. Permission letters for copyrighted material; pages as needed
 - h. List of software and hardware used in the development of the animation; one (1) page
 - i. Plan of Work log that indicates preparation for the event, as noted by date, task, time involved, team member responsible, and comments (see Forms Appendix); pages as needed
 - j. A completed Student Copyright Checklist (see Forms Appendix); pages as needed

B. Animation:

1. The video must be submitted in a common video format suitable for viewing with a VLC player, utilizing a Microsoft Windows operating system.
2. The URL must point to the main page of the team's entry. Entries that require a request for access be granted will not be judged.
3. Each animation must advance automatically once it has been opened and started by judges.
4. The animation is not to exceed three (3) minutes.
5. There is a three (3)-point deduction for each fifteen (15) seconds, or fraction thereof, over the three (3)-minute maximum length. For example: An animation that runs 37 seconds beyond the three (3)-minute limit will receive a deduction of nine (9) points.
6. Sound may accompany the animation, but it is not required.
7. All video footage, graphics, special effects, and audio clips must be originally created/filmed by the participants.
8. Where applicable, all ideas, text, images, and sound from other sources must be cited.
9. If copyrighted material is used, proper written permission must be included (see Student Copyright Checklist in Forms Appendix).
10. Absolutely no purchased content may be used in any part of the animation. Purchased content includes, but is not limited to, texture, models, and royalty free music.

EVALUATION**PRELIMINARY ROUND**

- A. The documentation portfolio
- B. The animation

SEMIFINAL ROUND

- A. The presentation

Refer to the official rating form for more information.

NOTE

Find information about STEM Animation on this website:
www.ncsu.edu/project/stemgaming/scivis.html

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Computer animator
- Game designer
- Instructional technologist
- Software engineer

STEM ANIMATION

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ Documentation portfolio was submitted and scored
- ☐ Animation is accessible online
- ☐ No copyrighted music, graphics, or other components
- ☐ ENTRY NOT EVALUATED

DOCUMENTATION PORTFOLIO (30 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Digital Portfolio (X1)	Portfolio is unorganized and/or missing three (3) or more components.	Portfolio includes most components and is generally organized.	All components of the portfolio are included, and content and organization are clearly evident.	
Purpose and Description (X1)	The purpose and description of the animation idea are unclear.	The purpose and description of the animation are generally explained.	The purpose and description of the animation are clear and concisely written.	
Storyboard (X1)	The hand-sketched storyboard is sloppy, seems to have been thrown together after the creation of the animation, and/or it does not correlate with the animation.	The storyboard is drawn appropriately and correlates with the completed animation.	The storyboard is of exceptional aesthetic and artistic value and clearly correlates with the animation.	
DOCUMENTATION PORTFOLIO SUBTOTAL (30 points)				

ANIMATION (50 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Communication (X1)	It is difficult to understand the idea being communicated; an illogical explanation is presented.	The idea is communicated, and thoughts are somewhat organized and/or concise.	The idea is communicated in an organized, clear, and concise manner.	
Creativity (X1)	The animation lacks creativity; no, or very few, design principles are integrated in the animation.	Some elements of creativity are expressed, and essential design principles are used somewhat effectively.	The animation exudes creativity; essential design principles and elements are integrated.	

ANIMATION (50 points) – continued				
Aesthetics and Artisanship (X1)	Unorganized, sloppy work is evident; the animation seems to be an afterthought and/or thrown together.	An organized presentation of essential issues in a logical format is evident.	An exemplary use of layout and design principles to logically communicate important data is evident.	
Graphical Representations (X1)	Graphical representations do not help to clarify the idea, or they are of little significance to the idea.	Graphical representations are appropriate and help supplement the idea by providing some clarity.	Graphical representations are of excellent quality and completely clarify the idea.	
Originality (X1)	The animation lacks imagination, originality, and artistic detail.	The animation is effective and innovative, conveying some depth.	The animation is inspiring, inventive, resourceful, and completely motivating.	
ANIMATION SUBTOTAL (50 points)				

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

TIME DEDUCTIONS	
A three (3)-point deduction will be incurred for each fifteen (15) seconds, or fraction thereof, over the three (3)-minute animation maximum length.	
TOTAL ANIMATION TIME	
NUMBER OF TIME INTERVAL DEDUCTIONS	
TOTAL TIME DEDUCTIONS	

Record scores in the column spaces below.

PRELIMINARY SUBTOTAL (80 points)

SEMIFINAL PRESENTATION (60 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Organization (X1)	Participants seem unorganized and unprepared for the presentation; illogical explanation of the idea is presented.	Participants are generally prepared for the presentation; an explanation of idea is communicated and generally organized.	The presentation is logical, well organized, and easy to follow; the idea is communicated in an organized and concise manner.	
Articulation (X1)	Communication of the animation design is unclear, unorganized, and or illogical; leadership and/or 21 st century skills are not evident.	Communication of the animation design is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the animation design is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	

SEMIFINAL PRESENTATION (60 points) – continued				
Delivery (X1)	The team is verbose and/or uncertain in its presentation; participants' posture, gestures, and lack of eye contact diminish the presentation.	The team is somewhat well-spoken and clear in its presentation; participants' posture, gestures, and eye contact are acceptable in the presentation.	The team is well-spoken and distinct in its presentation; participants' posture, gestures, and eye contact result in a polished, natural, and effective presentation.	
Knowledge (X2)	Participants seem to have little understanding of the concepts in their project.	Participants exhibit a basic understanding of the concepts in their project.	Participants show clear evidence of a thorough understanding of their project.	
Team Participation (X1)	The majority of the delivery is made by one member of the team; the partner may be disengaged from the presentation.	Both team members are generally engaged in the process, though one member may take on more responsibility than the other.	Both team members are actively involved in the presentation and responses to any questions; there is shared responsibility between team members.	
SEMIFINAL PRESENTATION SUBTOTAL (60 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
SEMIFINAL SUBTOTAL (60 points)				
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.</p> <p>TOTAL (140 points)</p>				

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

STEM ANIMATION

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Assistant for check-in, one (1)
- C. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stick-on labels for identifying entries
 - 5. Results envelope with coordinator forms
- B. Tables for entries
- C. One (1) computer with monitor as needed for judges
- D. One (1) extension cord and one (1) power strip as needed for judges
- E. Tables and chairs for event coordinator, judges, and participants

RESPONSIBILITIES

PRE-CONFERENCE

- A. National TSA will collect entries until 11:59 p.m. ET on May 15th and send out receipt confirmations to participants by June 10th. The results are shared with the CRC manager, event coordinator, and assigned judges.
- B. Review entries as they are submitted to the designated online storage utility.
- C. Manage communication and pre-conference evaluation (at least two [2] or more judges should be recruited earlier in the year). Coordinate with the Judge Manager.

- D. Judges determine the twelve (12) semifinalists and discuss and break any ties.
- E. Results are posted on-site at the national conference on the first full day.

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is being held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the evaluation of entries is to begin, meet with your judges and check in personnel to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the CRC event manager before the evaluation begins.

PRELIMINARY ROUND

- A. On the first full day of the conference, post a list of the twelve (12) semifinalists in random order.

SEMIFINAL ROUND

- A. Semifinalists report to the event area at the time and place stated in the conference program.
- B. Each semifinalist team signs up for a time to present its animation.
- C. During the presentation, semifinalist team representatives explain their work and answer any questions the judges may ask.
- D. Judges independently assess the twelve (12) semifinalist teams.

- E. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and CRC manager to determine either
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entryThe event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- F. Judges determine the ten (10) finalists and discuss and break any ties.
- G. Submit the finalist results and all related forms in the results envelope to the CRC room.
- H. If necessary, manage security and the removal of equipment and materials from the area.

STRUCTURAL ENGINEERING



OVERVIEW

Participants apply leadership and 21st century skills by collaborating with their team members to build a designated structure. Teams apply the principles of structural design and engineering through research, design, construction, destructive testing, and assessment to determine the design efficiency of a structure. Details about the structure and information related to it will be posted on the [TSA website](#) under Competitions/Themes and Problems. The on-site semifinalist problem is a variation of the pre-conference problem posted on the TSA website.

ELIGIBILITY

One (1) team of two (2) individuals per chapter may participate.

SAFETY EYEWEAR

- A. Participants are required to wear safety-approved eyewear during the on-site phase of this event.
- B. Prescription eyewear needs to have side shields to be considered safety eyewear.
- C. Should a team member remove the eyewear and fail to replace it, s/he will be reminded once.
- D. If there is a second infraction, the team will be asked to leave the competition.
- E. Sunglasses are not suitable.

TIME LIMITS

- A. On-site structures (semifinalist teams only) must be started, completed, and checked in during the three (3) hours allowed for design and construction.
- B. Semifinalist participants with time conflicts must present a written explanation of the conflict to the event coordinator at least one (1) hour before the construction time stated in the conference program. Work must begin during the time scheduled for the event.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants access the design brief under Competitions/Themes and Problems on the [TSA website](#).
- B. Participants conduct research and apply principles of structural design and engineering to their current structure.
- C. Pre-built structures must be started and completed during the current school year.
- D. All work must be completed by the team members only, and verified by the team's chapter advisor using the Team Verification form (see Forms Appendix).
- E. Participants render a full-size, three (3)-view (front, top, and right end) drawing (hand or computer-generated) of their structure.

PRELIMINARY ROUND

On-site Destructive Testing of Pre-Built Structures

- A. Participants report at the time and place stated in the conference program and check-in:
 - 1. Pre-built structure and any related required materials (including the Analysis and Assessment form (see Forms Appendix)
 - 2. Documentation portfolio materials
- B. Participants are required to wear safety approved eyewear (refer to the Safety Eyewear section of this guide).
- C. Structures are assessed and undergo destructive testing.
- D. Destructive testing of pre-built structures is not open for public viewing.
- E. Destructive testing is completed using structural testing equipment, as designated by TSA.
- F. When the destructive testing is completed, a list of twenty (20) semifinalist teams is posted.

SEMIFINAL ROUND

On-site Construction

- A. The twenty (20) semifinalist teams participate in the on-site problem, which feature the construction and destructive testing of a designated structure to determine the ten (10) finalist teams.

- B. Twenty (20) semifinalist teams report to the event area at the time and place stated in the conference program.
- C. Teams are seated by a monitor.
- D. The design problem is explained and a list of directions for the construction problem is provided.
- E. Teams have a three (3) hour window when drawing begins and building stops, typically allotted as:
 - 1. Thirty (30) minutes to review the problem and create a sketch/drawing of their solution.
 - 2. Two and one-half (2 and ½) hours to review the problem and construct a solution.
- F. During the building of the team's structure, construction regulations must be observed.
- G. All work stops at the coordinator's signal. Teams that fail to comply with coordinator or monitor directions, after one (1) warning, will be issued a penalty of 20% of the team's total score.
- H. Participants may leave early, but they must first complete check-out as directed.
- I. Teams return all supplied items as directed, and clean and clear their work stations. Failure to do so will result in a 20% penalty deduction.
- J. Teams must identify their structure with only their team ID number, using the label provided.
- K. Structures are allowed to dry in a secure area until destructive testing time.

Destructive Testing

- A. Structures are checked for rules violations and weighed before testing.
- B. Destructive testing is completed by evaluators and is open for spectator viewing.
- C. When all testing is completed, the greatest failure weight of all tested structures is recorded on the rating form, the efficiency rating of individual structures is calculated, and ranking is determined.
- D. Subjective criteria is scored only after all destructive testing is completed.
- E. The top ten (10) finalist teams are announced.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRE-CONFERENCE

- A. Documentation Portfolio:
 - 1. Documentation materials (comprising "a portfolio") are required and must be secured in a [clear front report cover](#) with the following single-sided, 8½" x 11" pages, in this order:
 - a. Title page that includes the event title, the conference city and state, the year, and the team/chapter ID number; one (1) page
 - b. Team Verification form
 - c. The Analysis and Assessment form, demonstrating leadership and/or 21st century skills through documentation of the team's iterations.
 - d. Full size drawing of one-side view of your structure.
 - e. A cut parts list of the materials used in the construction of your structure.

PRELIMINARY ROUND

- A. Participants must provide and wear safety glasses for this portion of the event.
- B. Drawing and pre-built structures must be completed prior to check-in.
- C. The testing of pre-built structures is not open to spectators.

SEMIFINAL ROUND

- A. Participants must provide and wear safety glasses for this portion of the event.
- B. Participants are required to provide their own tool box (with identification [school name, address, and advisor cell phone number]), which should not exceed twenty (20) inches (508 mm) length x ten (10) inches (254 mm) width x ten (10) inches (254 mm) height. The box must contain all items needed to fabricate the solution.

1. The following is a suggested list:
 - a. Cutting devices; NONE may be electric
 - b. Adhesives
 - i. Aerosol and electric applicators are not allowed
 - ii. A bottle of Uncure or Debonder is recommended
 - c. Temporary fastening devices
 - i. Straight pins
 - ii. Clamps
 - iii. Tape
 - d. A cutting surface that prevents table-top marring (required)
 - e. Rulers, straightedges, and/or measuring scales
 - f. Abrasives sheets, sanding sponges, emery boards
 - g. Marking devices (pens, pencils, etc.) and sharpener
 - h. Sheet of wax paper, as large as is needed for the competition (required)
 - i. Pliers, wrenches, nut drivers, as needed
 - j. Safety glasses and side shields, as required
- C. Planning and fabrication supplies are provided by TSA. Teams are issued a packet of construction materials (such as a specific type of wood) to use for fabrication of the on-site designed structure once the team's drawing of the on-site solution is complete.
 1. Planning and fabrication supplies (these materials may not be part of the structure submitted for testing):
 - a. 11" x 17" paper with ¼" grids for sketching the structure
 - b. Pin board
 - c. A sheet of wax paper
 - d. Structure label
- D. Teams that fail to comply with coordinator or monitor directions, after one (1) warning, will be issued a penalty of 20% of the team's total score.

- E. Filming and the taking of photographs is prohibited during the viewing of structure, judging, and testing.
- F. Subjective criteria is scored only after all destructive testing is completed

EVALUATION

Evaluation is based on the compliance and design efficiency of a pre-built structure and an on-site structure (semifinalists only), both of which are destructively tested. Subjective criteria will be scored only after all destructive testing is completed.

Please see the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

TSA AND CAREERS

This competition has connections to one (1) or more of the careers below:

- Architect
- Civil engineer
- Structural engineer
- Structural iron and steel work technician
- Engineering technician
- Mathematician

STRUCTURAL ENGINEERING – MIDDLE SCHOOL ANALYSIS AND ASSESSMENT

PRE-BUILT STRUCTURE	
For TEAMS:	
How many structures were designed, built, and tested prior to competition?	
Record the weight of the structure designated for competition:	
Predict the ultimate load-carrying capacity of the structure:	
Predict where or how the structure will fail:	
What are the four major types of forces that act on a structure under stress?	
What is the static load of a structure?	
What part of a testing device should be considered live load?	
What effect would a shorter length test block have during stress testing?	
For JUDGES:	
Record the weight of the structure after check-in and prior to testing:	
Record the actual load-carrying capacity of the structure:	

STRUCTURAL ENGINEERING

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

-
- ☐ Team of two is present
 - ☐ The structure is present, identified, and in its storage box
 - ☐ The Team Verification form completed
 - ☐ The Analysis and Assessment form completed
 - ☐ Full size drawing of one-side view of your structure
 - ☐ A complete cut parts list for your structure
 - ☐ ENTRY NOT EVALUATED

PRE-BUILT STRUCTURE (Construction) – (40 points)

Indicate N for non-compliant or C for compliant, for each regulation in the Construction section. One non-compliant mark will result in the entry not being evaluated. Dimensional criteria will have a tolerance of + or -1/8" for height.

Regulation	Noncompliant	Compliant
Outside Width of Structure	The outside width of the structure is greater than the designated construction width; the structure does not fit inside the PVC testing tube.	The outside width of the structure is within the designated tolerance of the assigned construction width.
Outside Height of Structure	The height of the structure is greater or less than the designated tolerance of the assigned construction height.	The height of the structure is within the designated tolerance of the assigned construction height.
Inside Structure Width	The inside structure space is less than the required construction space; the PVC test pipe does not fit inside of the structure.	The inside structure space is greater than the required construction space; the PVC test pipe fits inside of the structure.
Construction Materials	Material other than 1/8" by 1/8" balsa was used in the construction of the tower.	Only 1/8" by 1/8" balsa was used in the construction of the tower.
Substructure*	A substructure is present.	No substructure is present
Laminations	Laminations were used in the construction of the tower.	No laminations were used in the construction of the tower.
Coating of Materials*	Coating of the construction materials with glue is present.	No coating of the construction materials with glue is present.
Testing Rod and Block Clearance*	The testing block and rod cannot be placed and passed through the center of the structure to allow for testing.	The testing block and rod pass freely through the center of the structure to allow for testing.

PRE-BUILT STRUCTURE (Construction) – continued	
	DISQUALIFIED
PRE-BUILT STRUCTURE APPROVED FOR TESTING	
Record the mass (weight) of the structure (in grams to the nearest tenth of a gram) prior to testing.	
Record the failure weight in pounds to the nearest tenth of a pound.	
Determine the efficiency (shown to three decimal places) by multiplying the failure weight (or adjusted failure weight, as applicable) by 4.54 and then dividing by the mass (weight) of the structure.	

PRE-BUILT STRUCTURE TOTAL POINTS (40 points)	
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ON-SITE STRUCTURE (Qualification) – (40 points)			
For the ON-SITE STRUCTURE: Indicate N for non-compliant or C for compliant, in the Qualification and Construction sections below. In the Qualification section, one non-compliant mark will result in disqualification. In the Construction section, one non-compliant mark will result in the structure not being evaluated. Dimensional height criteria will have a tolerance of + or -1/8"			
Regulation	Noncompliant	Compliant	
Team of Two	Only one (1) team member is present.		Both team members are present
Safety Eyewear	Warnings about eyewear are issued.		No warnings about eyewear are issued.
Structure Identification	The identification sticker is not attached.		The identification sticker is attached.
Tools and Fabrication Supplies	Inappropriate tools or supplies are brought to the event.		Appropriate tools and supplies are brought to the event.
ON-SITE STRUCTURE (Construction)			
Outside Width of Structure	The outside width of the structure is greater than the designated construction width; the structure does not fit inside the PVC testing tube.		The outside width of the structure is within the designated tolerance of the assigned construction width.
Outside Height of Structure	The height of the structure is greater or less than the designated tolerance of the assigned construction height.		The height of the structure is within the designated tolerance of the assigned construction height.
Inside Structure Width	The inside structure space is less than the required construction space; the PVC test pipe does not fit inside of the structure.		The inside structure space is greater than the required construction space; the PVC test pipe fits inside of the structure.
Construction Materials	Material other than 1/8" by 1/8" balsa was used in the construction of the tower.		Only 1/8" by 1/8" balsa was used in the construction of the tower.
Substructure*	A substructure is present.		No substructure is present
Laminations	Laminations were used in the construction of the tower.		No laminations were used in the construction of the tower.
Coating of Materials*	Coating of the construction materials with glue is present.		No coating of the construction materials with glue is present.
Testing Rod and Block Clearance*	The testing block and rod cannot be placed and passed through the center of the structure to allow for testing.		The testing block and rod pass freely through the center of the structure to allow for testing.

ON-SITE STRUCTURE (Qualification) – continued	
	DISQUALIFIED
	On-site structure approved for testing
Record the mass (weight) of the structure (in grams to the nearest tenth of a gram) prior to testing.	
Record the failure weight in pounds to the nearest tenth of a pound.	
Determine the efficiency (shown to three decimal places) by multiplying the failure weight (or adjusted failure weight, as applicable) by 4.54 and then dividing by the mass (weight) of the structure.	

ON-SITE STRUCTURE TOTAL POINTS (40 points)	
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SUBJECTIVE CRITERIA (30 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Team Participation (X1)	The majority of the construction is done by one member of the team; the partner may be disengaged.	Both team members generally are engaged in the process, though one member may take on more responsibility than the other.	Both team members are actively involved in the construction; there is shared responsibility between team members.	
Drawing (X1)	The submitted drawing was incomplete, not accurate, of proper quality, or was not to scale; a complete parts list was not included.	The submitted drawing was complete but lacked clarity, accuracy, or was of poor quality; the parts diagram was not complete or was incorrect.	The submitted drawing was complete, accurate, and to scale; the parts list was complete and accurate.	
Portfolio (X1)	Portfolio is unorganized and/or missing three (3) or more components; leadership and/or 21 st century skills are not evident.	Portfolio includes most components and is generally organized; leadership and/or 21 st century skills are somewhat evident.	All components of the portfolio are included, and content and organization are clearly evident; leadership and/or 21 st century skills are clearly evident.	
SUBJECTIVE CRITERIA SUBTOTAL (30 points)				
Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right. Indicate the rule violated: _____				

To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.	TOTAL (110 points)	
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<p>Comments:</p> <p>I certify these results to be true and accurate to the best of my knowledge.</p> <p>JUDGE</p> <p>Printed name: _____ Signature: _____</p>

STRUCTURAL ENGINEERING

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges
 - 1. Preliminary round to evaluate pre-built structures, two (2) or more
 - 2. Semifinal round, to qualify structures after construction, two (2) or more
 - 3. Semifinal round, destructive test judges, two (2) or more
 - a. One (1) to weigh the structure, record structure weight, and record failure weight
 - b. One (1) to bring the structure to the testing location, position the structure on the testing device, operate the tester, and then remove and store the structure following testing
- C. Construction monitor, one (1) per twenty teams
- D. Timekeeper, one (1)

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stick on labels for identifying entries
 - 5. Results envelope with coordinator forms
- B. Testing equipment, provided by TSA
- C. Sample structures for both testing sessions that can be used to demonstrate the testing procedure and to determine that the testing equipment is working properly.
- D. Evaluation and recording equipment
 - 1. Gram scale (3-decimal place calculation)
 - 2. Tape measure or 2' rule
 - 3. Evaluation gauges (rulers)
- E. Site requirements
 - 1. Construction session
 - a. Tables and chairs suitable for cutting and gluing
 - b. Work area, at least 2' x 3' for each team (suggested space is two (2) teams per 6' x 2' or 8' x 2' area)
 - c. One (1) chair per participant
 - d. Tables for equipment check-out and check-in
 - e. Tables and chairs for evaluators
 - f. Secured area for drying entries and storing supplies
 - 2. Testing session
 - a. Tables for storage of structures
 - b. Table for weighing
 - c. Table for testing
 - d. Table for recording
 - e. Tables for storage of failed structures
 - f. Chairs for spectators
 - g. Barricade to separate testing area from spectators
 - 3. Semifinalist team packets provided by TSA containing construction materials and instructions.
 - a. Construction tools per team, to be used and returned to the event coordinator or helpers after construction:
 - i. Pin board as supplied, but generally a one-foot by two-foot (1' x 2') piece of fiber or foam board
 - ii. Grid paper, ¼" x ¼" grid on 11" x 17" paper for structure sketch (to remain with the completed structure when turned in)
 - iii. Wax paper to cover the pin board (to remain with the completed structure when turned in)
 - iv. Label for structure
 - b. Construction materials – Balsa as needed for each team
 - c. Instructions

RESPONSIBILITIES

- A. Prepare the structure problem statement (including any necessary related information) for posting on the TSA website.

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Check to see that all event equipment and materials have been secured.
- E. One (1) hour before the event is scheduled to begin, meet with judges/assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

EVENT CHECK-IN

- A. Check in participants at the time and place stated in the conference program.
- B. Participants check in:
 1. The pre-built structures
 2. The documentation portfolio
- C. Anyone reporting who is not on the entry list may check in only after official notification is received from the CRC.
- D. Late entries are considered on a case-by-case basis and only when the delay is caused by events beyond participant control.

PRELIMINARY ROUND/PRE-BUILT STRUCTURE

- A. Coordinate and manage the on-site testing of pre-built structures, the recording of results, and the determination of the twenty (20) semifinalist teams.
- B. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and CRC manager to determine either:
 1. To deduct 20% of the total possible points or
 2. To disqualify the entry

The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.

- C. Submit semifinalist results to the CRC for posting.
- D. Assemble semifinalist packets of construction materials and directions for the twenty (20) on-site semifinalist teams.

SEMIFINAL ROUND

Team Check-in for On-site Construction

- A. Check-in begins at the time stated in the conference program and continues until all teams arriving on time have been checked in and seated. The event begins at the posted time.
- B. Both members of a team must be present during check-in.
- C. No team is allowed to begin late unless its members have complied with the following: Participants with time conflicts must present a written explanation of the conflict to the event coordinator at least one (1) hour before the construction time stated in the conference program.
- D. Work must begin during the time frame scheduled for this portion of the event.

On-site Construction

- A. Assign team construction locations.
- B. When all teams are seated, distribute instructions and review these, as well as any details for the assigned structure.
- C. Teams are allowed a maximum of three (3) hours to complete their structure:
 1. Thirty (30) minutes of this time is allotted for completing the design drawing.
 2. Two and one-half (2 ½) hours, is allotted for actual construction.
- D. When a team notifies a monitor that the required sketch is complete, and the monitor confirms this, the team receives a materials packet and may begin the on-site construction phase of the event.
- E. No additional supplies are provided during the event.
- F. Call time at the end of the allotted three (3) hour time-frame. All teams must stop working at this point.
- G. All work stops at the coordinator's signal. Failure to comply with instructions will result in a penalty of 20% to the team's total score.

Team Check-out

- A. Establish the procedure for check-in and recording of finished structures.
 - B. Designate an area for storage, and allow for the return of construction materials.
 - C. Coordinate the return and removal of all supplied items and ensure that teams clean and clear their work stations. Deduct a 20% penalty for teams that do not comply.
 - D. Teams check in excess supplies as directed by the monitors.
 - E. Ensure that teams identify their structure with only their team ID number, using the label provided.
 - F. Teams place their structures in the storage area with the sketch as directed by the monitor. The structure must be identified with the team number only (using the label provided in the materials packet).
 - G. Once check-out is complete, all participants leave the competition area. Participants may leave early, but they must complete check-out as directed.
 - H. The structures are secured by the monitor and allowed to dry for a minimum of twelve (12) hours.
5. Determine each structure's efficiency by the greatest failure weight x 4.54, divided by the weight of the structure in grams; round off the efficiency to three (3) decimal places and record it on the rubric.
 6. The highest numeric efficiency determines the winner. In the case of an efficiency tie, the greatest weight held by the tied entries determines the winner.

Destructive Testing

- A. After the structures have dried, judges report at the time and place stated in the conference program.
 - B. Judges test each structure and score the results.
 - C. Judges score the Subjective Criteria for semifinalists after destructive testing has taken place.
1. A non-compliance construction regulation violation was determined before testing.
 2. The structure cannot be placed on the tester.
 3. The testing attachment cannot be properly placed within or on the structure.
 4. Straight pins are left in the structure.
 5. There is a failure of a participant to wear safety eyewear and/or to follow safe practices.
 6. Laminations fail to comply with the guidelines as specified in the current year's challenge.
 7. Failure to use each of the materials specified in the current year's challenge.

EVALUATION

- A. Check (with assistance from judges) all structures for regulations compliance. Structures that are in compliance are tested without penalty.
 1. Weigh all structures before testing and record the weight on the evaluation rubric.
 2. Use the testing device, designated by TSA, to test each structure. (A specific testing block or attachment for the structure may be necessary for the on-site problem.)
 3. Apply an increasing load to the structure, via the test block or attachment, until the structure fails.
 4. Record the greatest failure weight on the rubric. This weight is the greatest weight recorded (of all the tested structures) during testing before they fail.
- C. Structures with one (1) construction regulation non-compliance mark is tested, but a 20% penalty will be noted on the rating form. (The penalty, a 20% reduction of the greatest weight held in the competition, is subtracted from the team's failure weight. This penalty factor is not determined until all structures have been tested).
 - D. Manage, with assistance from judges, the destructive testing of all structures that were not officially tested due to non-compliance.
 - E. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
 - F. Judges use the evaluation metrics and determine the placement of ten (10) finalists.
 - G. Submit the finalist results and all other related forms in the results envelope to the CRC room.
 - H. If necessary, manage the security and removal of materials from the event area.
 - I. Semifinalist teams may pick up their structures at a time determined by the event coordinator.

OVERVIEW

Applying leadership and 21st century skills, teams collaborate to develop a computer-controlled model solution to a given problem, typically one based on an industrial setting. Teams analyze the problem, build a computer-controlled mechanical model, program the model, explain the program and mechanical features of the model-solution, and leave instructions for judges to operate the device.

ELIGIBILITY

One (1) team of three (3) individuals per state may participate.

TIME LIMITS

The competition consists of three phases.

- A. Phase 1: The team's captain is given thirty (30) minutes to set up the team's equipment and reference materials.
- B. Phase 2: Following the set-up time, teams are given fifteen (15) minutes for problem analysis.
- C. Phase 3: Following the problem analysis time, teams are provided two and one-half (2.5) hours for model development and programming.

ATTIRE

TSA competition attire is required.

PROCEDURE

ON-SITE CHALLENGE

- A. Each team selects a team captain prior to the orientation meeting.
- B. A team orientation meeting takes place at the beginning of the event at the conference.
- C. The captain checks-in for the team during the set-up time by submitting his/her student identification number and the team's identification number for the written and model portions of the event.
- D. The problem and the Inventor's Log are presented to teams at the beginning of the fifteen (15) minute problem analysis session prior to model-building.
- E. Teams must complete their description or interpretation of the problem during this time.

- F. Each team is given a maximum of two and one-half (2½) hours to:
 1. Construct a model that simulates realistic industrial processes
 2. Program the model
 3. Test the solution
 4. Describe the program and mechanical features of the model-solution
 5. Complete directions for judges to use to activate the model
- G. When finished, teams save their programs and leave them on-screen in operable form with the ability to be reset.
 1. Before leaving the event room, teams demonstrate the operation of the model with judges present.
 2. The interview takes place directly after the demonstration.
 3. After judges have observed the operation of a team's model, the team leaves the room.
 4. The coordinator determines the amount of time permitted for the team's demonstration based on the number of teams and the complexity of the problem.
 5. Evaluation of the solutions takes place without the teams present.
- H. Judges independently assess the entries, including each team's interview responses.
- I. The top ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

- A. No reference materials or building cards are allowed.
- B. Participants provide their own laptop computer with hardware and software systems.

- C. All equipment must be labeled with the team's identification number, advisor name, and advisor contact information.
- D. Each team provides pencils and scrap paper along with its own materials kit, which must be appropriate to build a system that can identify, secure, and move objects and that has light and/or sound outputs.
- E. A problem is developed based upon the assumption that every materials kit contains at least:
 1. Two (2) optical sensors
 2. Two (2) touch sensors
 3. Two (2) motors
 4. Two (2) audio and two (2) light outputs
 5. Gears, wheels, and axles appropriate to build a motorized vehicle and/or conveyor belt
 6. Balls, blocks, and pegs that can be used as objects to be moved and manipulated
 7. Velcro, tape, clamps, and other materials to secure or move the above objects (balls, blocks, and pegs)
- F. The following definitions are an integral part of the event regulations:
 1. Repeatability – the device is programmed to reset automatically.
 2. Functional control – the device must accomplish the task in an efficient manner and be user friendly.
 3. Model-solution – the physical device must simulate the realistic processes used in the industry.
 4. Conservation of materials – the model reflects the best use of materials to solve the problem, without being overbuilt.
- G. Programs must be written completely on-site.
- H. Use or modification of any programs written prior to the competition result in disqualification.
- I. An example of a problem for this event is provided below to help students understand and interpret a typical issue common to business and industry that might be used at a National TSA Conference.

Johnson Recycling Center needs an automatic system for separating its two primary types of recycling material products. If type A material is detected in the product, the system should move the product to the right side of a sorting line. If type B

material is detected on the assembly line, the product should be delivered to the left side. Whenever a product is delivered, a light or buzzer should activate for 10 seconds to alert workers that a product is available on one or the other of the sorting lines. The system should then reset to separate and deliver a new product. Design a prototype that can automatically deliver at least four products without any user intervention, then reset.

EVALUATION

- A. Written work
- B. Model function
- C. Programming structure and efficiency
- D. The presentation/interview

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- CNC programmer
- Computer programmer
- Robotics engineer

SYSTEM CONTROL TECHNOLOGY INVENTOR'S LOG

Participant/Team ID# _____

Use only the space provided. This section must be completed **DURING** the process of problem analysis.

1. Description or interpretation of the given problem:

The two parts below must be completed **AFTER** the problem analysis session.

2. Description of the team solution (explain the unique features of the program and model):

3. Directions to evaluators to start the system:

SYSTEM CONTROL TECHNOLOGY

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ Computer hardware is present
- ☐ Materials kit is present
- ☐ ENTRY NOT EVALUATED

INVENTOR'S LOG (20 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Description of Problem (X1)	The description is incomplete, and/or it is illogical and unorganized; the description is simply a restatement of the problem's guidelines.	The description includes a logical and general understanding of the problem's guidelines.	An organized, logical, and concisely written description of the problem is provided; it includes all major aspects of the problem's guidelines, as well as original thoughts.	
Description of Solution and Activation Instructions (X1)	The team's written solution does not correlate with the final system creation; the solution is illogical related to the problem's guidelines, and/or directions to activate the solution are included but incomplete.	The team's written solution generally correlates with the final system creation; adequate directions to activate the solution are included.	A strong correlation between the team's written solution and final system creation is provided; the solution is written clearly and concisely; activation instructions are included and written concisely.	
INVENTOR'S LOG SUBTOTAL (20 points)				

SOLUTION TO PROBLEM (60 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Realistic Simulation (X1)	The simulation is not realistic; it has an abstract design that would not work effectively in its intended environment.	The simulation is somewhat realistic and logically designed, and it may work effectively in its intended environment.	The simulation is realistic and similar to a system that would be effective in its intended environment.	
Dependability of Solution (X1)	The solution is not constructed with dependability in mind; when the system is operated, construction pieces fall off, etc.	Most of the solution is well constructed and dependable, with only a few components that are questionable.	Every component of the solution is well constructed and dependable; practical construction techniques have been used.	

SOLUTION TO PROBLEM (60 points) – continued

Conservation of Materials (X1)	An inefficient use of construction materials is obvious; too many unnecessary materials are incorporated into the design.	Most of the components of the solution are designed with conservation in mind; the construction is generally adequate.	All components of the solution are designed and assembled with conservation of materials in mind; the construction is elegant and not overbuilt.
Solution to Problem (X2)	The solution is missing three (3) or more required attributes/criteria and several do not function as intended.	The solution includes most of the required attributes/criteria, and they function adequately.	The solution includes all required attributes/criteria listed in the design details, and all attributes function appropriately and correctly.
Ingenuity and Creativity (X1)	The solution and design are unauthentic, complex, and do not function as a system.	The solution has some original ideas in its design, and its construction is adequate.	The solution is truly unique and authentic; its construction is concise and designed with simplicity.

SOLUTION TO PROBLEM SUBTOTAL (60 points)**PROGRAMMING STRUCTURE (20 points)**

CRITERIA	Minimal performance	Adequate performance	Exemplary performance
	1-4 points	5-8 points	9-10 points
Programming Efficiency (X1)	The software used to program the system is overly complex and inefficient; advanced programming techniques, which would have simplified the programming of specific tasks, are not included.	The programming software is efficient, with some advanced features that simplify the solution's criteria and/or attributes.	A concise and logical programming application is used that incorporates advanced features to simplify the solution's criteria and/or attributes.
Program Structure (X1)	The programming structure is illogical, unorganized, or overly complicated and/or complex; the program does not reset.	There is evidence of an organized programming structure and adequate use of sub-routines; the program resets.	The programming structure is concise and predictable; there is appropriate use of sub-routines where needed; the program resets.

PROGRAMMING STRUCTURE SUBTOTAL (20 points)

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

PRELIMINARY SUBTOTAL (100 points)

Record scores in the column spaces below.

INTERVIEW (10 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Articulation (X1)	Communication of the design process is unclear, unorganized, and or illogical; leadership and/or 21 st century skills are not evident.	Communication of the design process is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the design process is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
INTERVIEW SUBTOTAL (10 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
SEMIFINAL SUBTOTAL (10 points)				
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.</p> <p>TOTAL (110 points)</p>				

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

SYSTEM CONTROL TECHNOLOGY EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges, two (2) or more
- C. Assistants, two (2)

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stopwatches
 - 5. Copies of the written problem
 - 6. Copies of the Inventor's Log
 - 7. Results envelope with coordinator forms
- B. Large room with sufficient electrical outlets to accommodate a first place team from every state and affiliated country
- C. Power strips with surge protectors and extension cords
- D. One (1) table and three (3) chairs per team

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) or room in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.

- E. At least one (1) hour before the event is scheduled to begin, meet with judges/assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

EVENT CHECK-IN

- A. Begin the event at the scheduled time by closing the doors and checking the entry list.
- B. All participants and judges should be in the room at this time.
- C. Late participants and/or entries are considered on a case-by-case basis and only when lateness is caused by events beyond the participant's control.
- D. In order to compete, participants must be on the entry list or must have approval of the CRC.
- E. Secure teams' equipment in the area designated.

ON-SITE CHALLENGE

- A. At the orientation meeting, obtain identification numbers for each team captain and the captain's respective team.
 - 1. Judges must be present at the orientation meeting.
 - 2. Review the time limits, procedure, and regulations with team captains.
- B. Distribute the problem and Inventor's Log to teams at the beginning of the event.
- C. Teams have fifteen (15) minutes to complete their interpretation of the problem, using the Inventor's Log.
- D. Each team is given two and one-half (2 ½) hours to complete the remaining portion of the event.
- E. Teams must demonstrate that their device/model is operable and has the ability to reset.
 - 1. Judges must observe this demonstration and may ask a few questions.
 - 2. Judges also may take notes, but evaluation of a team's work occurs only after the team has left the event room.

F. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:

1. To deduct twenty percent (20%) of the total possible points in this round
2. To disqualify the entry

The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.

G. Judges determine the ten (10) finalists and discuss and break any ties.

H. Submit the finalist results and all related forms in the results envelope to the CRC room.

I. If necessary, manage security and the removal of materials from the event area.

OVERVIEW

Participants demonstrate their knowledge of TSA and concepts addressed in the technology content standards by completing an objective test. Applying leadership and 21st century skills, semifinalist teams participate in a question/response, head-to-head competition.

ELIGIBILITY

One (1) team of three (3) individuals per chapter may participate. Teams that take the test and advance to the semifinalist portion of the event must be comprised of the same three (3) members.

TIME LIMITS

PRELIMINARY ROUND

- A. The one (1)-hour test is administered to all members of the team at the same time.

SEMIFINAL ROUND

- A. Teams selected as semifinalists must be available as scheduled for oral competition.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRELIMINARY ROUND

- A. Participants report to the event area at the time and place stated in the conference program for the test.
- B. Participants follow the specific regulations and adhere to the directions provided on-site by the event coordinator.
- C. Each team is assigned a number by the event coordinator. This number establishes the initial order of participation in the oral portion of the event.
- D. All team members take the exam.
- E. The sixteen (16) top-scoring teams qualify as semifinalists.
- F. A list of semifinalists (in random order) is posted.

SEMIFINAL ROUND

- A. Semifinalist team and their advisor report to the oral event area holding room at the time and place stated in the conference program.
- B. After a short briefing, advisors leave and the teams remain in the holding room until they are called for competition.
- C. When instructed to do so, two (2) teams enter the event area and are seated according to instructions.
- D. Teams are paired using the semifinalist teams' bracket.
- E. Questions are drawn from a card file resource bank.
- F. If equipment malfunctions, a question that is being considered at that time automatically is eliminated. If equipment malfunctions three (3) times, time is called by the event coordinator to set up back-up equipment. After equipment has been set up and tested, the event continues from the point where it stopped.
- G. Once a team is eliminated, the team is out of the oral competition except for the round in which the third and fourth positions are determined.
- H. The top ten (10) finalist teams are announced at the awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRELIMINARY ROUND

- A. Tests may be administered online or via a scan-type answer sheet. Please review the Competition Updates page on the [TSA website](#).
- B. Scan-type forms are furnished by the event coordinator, if applicable.
- C. Participants are responsible for bringing two (2) sharpened No.2 pencils to the test site.

- D. Participant identification numbers must be entered on the scan form in the space indicated.
- E. Failure to follow instructions shall result in the score sheet not being scored.
- F. Participants must stop work immediately when time is called.
- G. Should a participant complete the test during the time allocated, the participant follows check out procedures as directed by the event coordinator. Failure to do so results in disqualification of the participant.
- H. All tests must be turned in before leaving the test area.
- I. The average of the test scores of all three (3) team members determines team ranking.

SEMIFINAL ROUND/ORAL COMPETITION

- A. Sixteen (16) teams, based upon the test results, are selected as semifinalists.
- B. All three (3) members of a semifinalist team must be available to participate at the scheduled time for the oral competition portion of the event.
- C. If a team or member is late for participation, that team forfeits and is eliminated from competition.
- D. No transmitting or recording devices are permitted to assist in answering a question in the event area.
- E. No prompting is permitted.
- F. Teams that leave the holding room before being called for competition are eliminated.
- G. Teams may visit with other teams in the holding room.
- H. No advisors or visitors may enter the holding room.
- I. Team members may not enter the oral event area as spectators until their team has been entirely eliminated from competition.
- J. A team's score is derived from the total number of correct answers to the questions asked:
 - 1. Twelve (12) questions are asked per round; no questions are repeated in another round.
 - 2. A correct answer gives the team ten (10) points, and an incorrect answer results in a loss of five (5) points.
- 3. The team member who "buzzes in" to answer a question has five (5) seconds to answer the question without discussion.
- 4. After a question is read, competing teams have ten (10) seconds to answer. If neither team buzzes in, the reader moves to the next question.
- 5. If a team member buzzes in before a question is finished being read, the reader ceases reading and the team member must give the exact answer as printed on the answer card.
- 6. If the answer is incorrect, the reader reads the entire question for the opposing team.
- 7. In case of a tie, three (3) additional questions and bonus questions are asked.
- 8. If a tie exists after the first tiebreaker round, then three (3) additional questions and bonus questions are asked.
- 9. This procedure continues until the tie is broken.
- 10. The last question of every round is a bonus question that is worth fifteen (15) points,
- 11. Questions, to include the bonus question, may not be discussed by teams.
- 12. If a team answers the bonus question correctly, they are given an additional question to answer. The team may discuss this question.
- 13. If the bonus question is not answered correctly, participants are not given an additional question.
- 14. The highest test scores are used to determine the additional two (2) finalists who were eliminated in the initial round of the oral competition.

EVALUATION

PRELIMINARY ROUND

- A. Averaged test scores are used to determine the sixteen (16) semifinalist teams

SEMIFINAL ROUND

- A. Performance during the oral competition

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Computer technician
- Construction analyst
- Engineer
- Entrepreneur
- Technology education instructor

TECH BOWL

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Competition Round ID# _____

Team # _____ (A) Team # _____ (B)

Scorekeeper's Signature _____

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

☐ ENTRY NOT EVALUATED

TEST (50 points)								Team A Average	Team B Average	
Record the test scores of each of the three (3) team members (for team A and B) in the boxes below and then calculate the team average. Record the team average in the column space to the right.										
Team member 1	(A)	(B)	Team member 2	(A)	(B)	Team member 3	(A)	(B)		
TEST SUBTOTAL (50 points)										
Rules violations (a deduction of 20% of the total possible points for the above sections) must be initiated by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.										
Indicate the rule violated: _____										
PRELIMINARY SUBTOTAL (50 points)										

SEMIFINAL ORAL COMPETITION						Team A Running Score	Team B Running Score
Mark an X in the box beside the team that gives the correct response to the question and an O beside the team that gives an incorrect response. Record the scores for each response in the column to the right.							
Question #	Points						
1.	+10 for correct, -5 for incorrect response	Team # _____		Team # _____			
2.	+10 for correct, -5 for incorrect response						
3.	+10 for correct, -5 for incorrect response						
4.	+10 for correct, -5 for incorrect response						
5.	+10 for correct, -5 for incorrect response						
6.	+10 for correct, -5 for incorrect response						
7.	+10 for correct, -5 for incorrect response						
8.	+10 for correct, -5 for incorrect response						
9.	+10 for correct, -5 for incorrect response						

SEMIFINAL ORAL COMPETITION – continued					
Mark an X in the box beside the team that gives the correct response to the question and an O beside the team that gives an incorrect response. Record the scores for each response in the column to the right.					
Question #	Points				
10.	+10 for correct, -5 for incorrect response	Team # _____		Team # _____	
11.	+10 for correct, -5 for incorrect response				
Bonus question	+15 for correct, -5 for incorrect response				
Additional question	+5 points for answering correctly				
SEMIFINAL ORAL COMPETITION SUBTOTAL					

Team A
Running
Score

Team B
Running
Score

Tie Breaker Questions					
1.	+10 for correct, -5 for incorrect response	Team # _____		Team # _____	
2.	+10 for correct, -5 for incorrect response				
3.	+10 for correct, -5 for incorrect response				
TIE BREAKER QUESTIONS SUBTOTAL					

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.
Indicate the rule violated: _____

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SEMIFINAL SUBTOTAL (155 points)

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To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary. TOTAL (155 points)

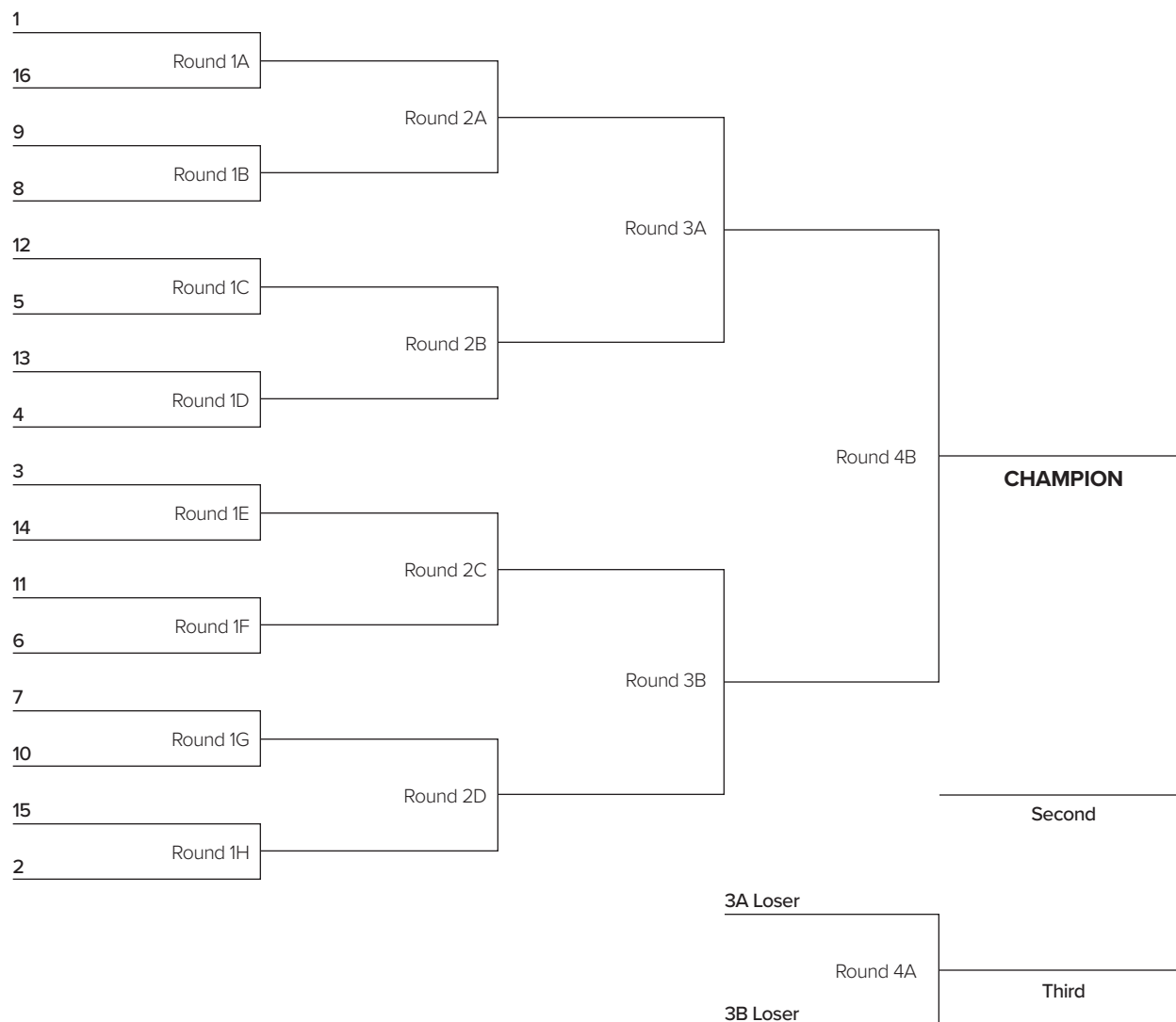
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Comments:

I certify these results to be true and accurate to the best of my knowledge.
JUDGE
Printed name: _____ Signature: _____

SEMIFINALIST TEAMS BRACKET

MIDDLE SCHOOL



Note to evaluators: This is a single elimination format (semifinalist teams ONLY).

Team 1		Team 9	
Team 2		Team 10	
Team 3		Team 11	
Team 4		Team 12	
Team 5		Team 13	
Team 6		Team 14	
Team 7		Team 15	
Team 8		Team 16	

TECH BOWL

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Timer for exam, one (1)
- C. Proctors for exam, four (4)
- D. Timekeeper for oral competition, one (1)
- E. Scorekeeper for oral competition, one (1)
- F. Moderator for oral competition, one (1)
- G. Judges, for semifinal oral competition, two (2)
- H. Assistants for oral competition, two (2)

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of event judges/assistants
 - 4. Copies of the test (coded A or B), one (1) for each participant (these tests must be returned immediately following the event)
 - 5. Results envelope with coordinator forms
- B. Test:
 - 1. Stopwatch for timekeeper
 - 2. Tables and chairs or tablet armchairs to accommodate all participants
 - 3. Scantron instruction forms, if applicable
 - 4. Coordinators are responsible for creating the test to be administered at the national conference; copies are provided by the national TSA office, if applicable.
- C. Oral competition
 - 1. Table and chairs for the event judges and moderator
 - 2. Two (2) tables and six (6) chairs for the event team, facing the moderator and audience
 - 3. Tech Bowl bracket
 - 4. List of chapters for the event

- 5. Buzzer system and controls
- 6. A large printed sign (to be placed outside the oral competition room) stating that no filming, taking of photos, or use of any electronic recording devices is allowed in the competition room
- 7. Stopwatch for timekeeper
- 8. 5" x 8" question cards selected from the technology bowl test bank, with questions and the acceptable answer(s) clearly typed

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is scheduled to begin, meet with judges/assistants to review time limits, procedures, regulations, evaluation, and any other details associated with the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRELIMINARY ROUND

- A. Begin the event at the scheduled time by closing the doors and checking the entry list.
- B. All participants and event judges should be in the room at this time.
- C. Late participants and/or entries are considered on a case-by-case basis and only when lateness is caused by events beyond the participant's control.
- D. In order to compete, participants must be on the entry list or must have approval of the CRC.

- E. Distribute the scan forms to the participants, if applicable.
 - 1. Direct participants to fill in their student identification number and test code letter in the appropriate spaces.
 - 2. Provide an opportunity for any questions about the scan form.
- F. Ensure the following testing procedure is applied with the help of the proctors (tests are coded A or B).
 - 1. Participants seated next to each other should not have the same coded test; tests should be alternating (e.g. A, B, A, B).
 - 2. If the test is administered as hard copies, instruct the participants to keep the tests face down until they are directed to turn them over and begin.
 - 3. If exams are administered electronically, instruct participants not begin until the scheduled time.
- G. Acting as the timer and with proctors positioned around the event room, direct the participants to turn their test over, place their code number and the code letter found on the test on their scan form, and begin.
- H. Exactly one (1) hour from the time that the participants begin the test, call time.
 - 1. Direct students to check out with a test proctor once they are finished with their test.
 - 2. Proctors collect all tests and students immediately leave the testing room.
 - 3. If a line forms students must remain completely silent. Any talking will result in a zero score for their test.
- I. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry

The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- J. Determine the sixteen (16) semifinalist teams based on team members' averaged score on the test.
- K. Prepare a list of the sixteen (16) semifinalist teams and submit it to the CRC for posting.

SEMIFINAL ROUND/ORAL COMPETITION

- A. Run the oral component of the event as described in the Procedure section.
- B. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- C. Judges determine the ten (10) finalists and discuss and break any ties.
- D. Submit the finalist results and all related forms in the results envelope to the CRC room.

OVERVIEW

Applying leadership and 21st century skills, participants demonstrate the ability to use the technical design process to solve an engineering design problem on-site at the conference.

ELIGIBILITY

One (1) team of two (2) individuals per chapter may participate.

TIME LIMITS

Twenty-four (24) hours is allowed to solve the engineering design problem.

ATTIRE

TSA competition attire is required.

PROCEDURE

ON-SITE CHALLENGE

Participants report to the event area at the time and place stated in the conference program to receive the design brief and instructions about where and when to submit their solution and portfolio to the problem the next day.

- A. Teams follow the technical design process loop to solve the provided engineering design problem.
- B. All work must be completed solely by the teams entered in this competition. No outside help is permitted.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

DESIGN PREPARATION

- A. Students prepare a portfolio that includes each step of the technical design process loop. (Figure 1).

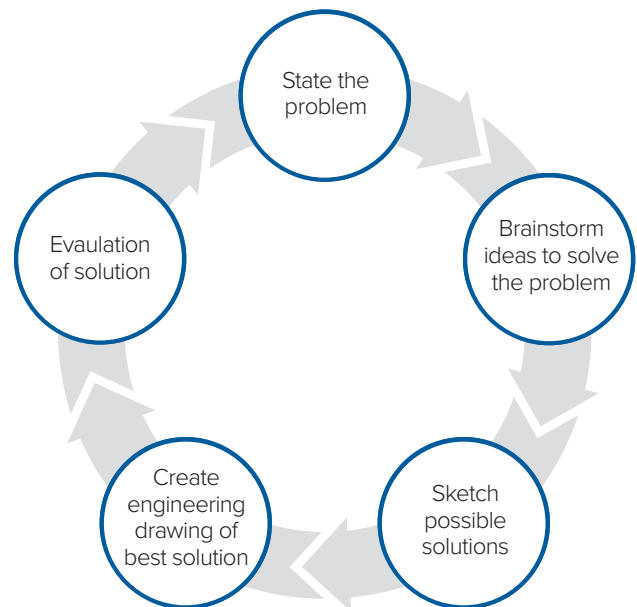


Figure 1: Technical design process loop

- B. Students develop a problem statement interpretation from the problem provided.
- C. The portfolio should show a logical progression from one step of the loop to the next.
- D. Documentation Portfolio:
 - 1. Documentation materials (comprising “a portfolio”) are required and must be secured in a [clear front report cover](#) with the following single-sided, 8½" x 11" pages, in this order:
 - a. Title page with the event title, conference city and state, the year, and the team/chapter ID number; one (1) page
 - b. Table of contents; one (1) page
 - c. Team’s interpretation of the problem, including a list of criteria and constraints set forth in the design brief; one (1) page
 - d. Demonstrated use of a brainstorming technique of the team’s choice (mind mapping, reverse engineering, word association, etc.), to develop ideas to solve the problem using leadership and/or 21st century skills, teams document the iteration brainstorming process; one (1) page

- e. At least three (3) hand-drawn sketches of different solution options to a given problem. One (1) page for each hand-drawn sketch; three (3) pages total:
 - i. Each hand-drawn solution must be developed based on the selected brainstorming technique.
 - ii. Each hand-drawn sketch also must include a solution pro/con list written on each sketch to aid in selecting the best design;
 - iii. Label the first solution "Solution Option 1," the second "Solution Option 2," and the third "Solution Option 3."
- f. Based on the pro/con list for each of the hand-drawn solutions to the problem, select the best solution and create an engineering drawing based on the solution; one (1) page.
- g. Using the engineering drawing of the final solution, write a paragraph that evaluates the final solution and answers the following question, "Does the final design meet all the elements set forth in the design brief?"; one (1) page.
- h. A sample design brief is provided below to help students understand a typical engineering design problem for this event.

Design Brief Sample

(This design brief is ONLY an example of the type of problem that participants may expect at the conference.)

Many professionals have a desk that has limited space for supplies, laptops, monitors, and other materials. Design a storage system that is no larger than 10" x 12" x 12" that can hold pencils/pens, office supplies, cell phones, a 20fl oz water bottle, and additional items that you desire. Considering the potential for condensation with fluids, select the best material for the solution. The solution can be numerous smaller parts of the same shape/size that can be joined as desired to form a complete system within the limits.

EVALUATION

- A. The documentation portfolio
- B. The overall technical design process

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Designer
- Engineer
- Quality assurance engineer
- Engineering manager
- Creative consultant

TECHNICAL DESIGN

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

☐ Documentation portfolio is present

☐ ENTRY NOT EVALUATED

SOLUTION (100 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Portfolio (X1)	Not all portfolio pages are included, and/or the pages are formatted incorrectly.	Most portfolio elements are included, organized, and formatted correctly.	Outstanding organization skills are evident in the preparation of the portfolio.	
Interpretation of Problem (X1)	Interpretation of the problem is vague, with few or no criteria/constraints included in the description; statement is difficult to understand.	Interpretation of the problem, criteria, and constraints are included and generally identified.	Interpretation of the problem is well-developed and further investigates the included criteria/constraints.	
Brainstorming Technique (X1)	There is no clear evidence of the use of brainstorming to interpret the design of the problem; leadership and/or 21 st century skills are not evident.	Use of brainstorming (which incorporates the problem statement, criteria, and constraints to solve problem) is apparent; leadership and/or 21 st century skills are somewhat evident.	Exceptional and organized use of brainstorming (which incorporates each element of the design brief) is evident; leadership and/or 21 st century skills are clearly demonstrated.	
Solution Option 1 (X1)	Sketch is sloppy and poorly constructed, and/or it appears to be included as an afterthought to the design; there is no design pro/con list, or it is incomplete.	Sketch is generally well drawn and includes the pro/con list; evidence of the final design is illustrated in the sketch.	Sketch is of exceptional quality and includes a creative pro/con list; clear transformation from the sketch to the final design is evident.	
Solution Option 2 (X1)	Sketch is sloppy and poorly constructed, and/or it appears to be included as an afterthought to the design; there is no design pro/con list, or it is incomplete.	Sketch is generally well drawn and includes pro/con list; evidence of the final design is illustrated in the sketch.	Sketch is of exceptional quality and includes a creative pro/con list; clear transformation from the sketch to the final design is evident.	
Solution Option 3 (X1)	Sketch is sloppy and poorly constructed, and/or it appears to be included as an afterthought to the design; there is no design pro/con list, or it is incomplete.	Sketch is generally well drawn and includes a pro/con list; evidence of the final design is illustrated in the sketch.	Sketch is of exceptional quality and includes a creative pro/con list; clear transformation from the sketch to the final design is evident.	
Final Solution (X2)	Solution conveys a sloppy design, and/or does not incorporate key elements in the design brief, and/or drafting techniques are not proper.	Solution incorporates most elements laid out in the design brief; drawing uses proper drafting techniques and methods.	Solution exudes creativity and addresses all design brief elements; proper drafting techniques are used in the design.	

SOLUTION (100 points) – continued				
Evaluation of Design (X2)	Evaluation is poorly written; it is a reiteration of the design brief elements, with little or no examination of the finished design.	Evaluation satisfactorily answers the question “Does the final design meet all the elements set forth in the design brief?”	Evaluation response is creative and unbiased; it is well written and answers the posed question completely.	
SOLUTION SUBTOTAL (100 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.</p>			TOTAL (100 points)	

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

TECHNICAL DESIGN

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges, two (2) or more

MATERIALS

- A. Coordinator's packet, containing:
 1. Event guidelines, one (1) copy for the coordinator and for each judge
 2. TSA Event Coordinator Report
 3. List of judges
 4. Results envelope with coordinator forms
- B. One (1) copy of the technical design problem (in design brief format) for each team

RESPONSIBILITIES

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area or room in which the event is being held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the judging of solutions is scheduled to begin, meet with judges to review the procedures, regulations, evaluation, and any other details associated with the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

EVENT CHECK-IN AND DESIGN PROBLEM DISTRIBUTION

- A. Meet with all teams at the time and location scheduled in the conference program.
- B. Distribute a copy of the technical design problem to each team.
- C. Ensure that all participants understand the event requirements, as well as the time and place to submit their entry.
- D. Begin entry check-in at the time and place stated in the conference program.

ON-SITE CHALLENGE

- A. Collect the documentation portfolios and the problem solution at the time and place stated in the conference program.
- B. Judges independently review each entry with neither students nor advisors present.
- C. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 1. To deduct twenty percent (20%) of the total possible points in this round
 2. To disqualify the entry
 The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- D. Judges determine the ten (10) finalists and discuss and break any ties.
- E. Submit the finalist results and all related forms in the results envelope to the CRC room.
- F. If necessary, manage security and the removal of materials from the event area.

OVERVIEW

Applying leadership and 21st century skills, participants develop, build, and launch an E-rated, online game that focuses on the subject of their choice. The game should be interesting, exciting, visually appealing, and intellectually challenging. Semifinalist teams participate in an interview to demonstrate the knowledge and expertise they gained during the development of the game.

ELIGIBILITY

One (1) team of at least two (2) individuals per chapter may participate.

TIME LIMITS

PRE-CONFERENCE

- A. All components of the chapter's entry, including the website address (URL) for the entry, must be finished, submitted, and accessible via the Internet by 11:59 p.m. ET on May 15th.
- B. Email verification of each team's entry will be made by June 10th.
- C. The game submitted for evaluation must be greater than three (3) minutes in length of play and must be interactive.
- D. A deduction of five (5) points total will be incurred for a game that completes under the three (3)-minute time minimum.
- E. The timing of the game segment starts with the first image or sound presented.
- F. Games must be playable from the deadline until the end of the National TSA Conference.

SEMIFINAL ROUND

- A. Up to ten (10) minutes are allowed for the on-site interview.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants design an online game based on a subject of their choice.
- B. Participants record the design process in a documentation portfolio.
- C. The game entry and documentation must be submitted by 11:59 p.m. ET on May 15th.
- D. Submission information will be provided on the [TSA website](#) under Competition Updates.

PRELIMINARY ROUND

- A. A list of twelve (12) semifinalist teams (in random order) is posted on-site on the first full day of conference.

SEMIFINAL ROUND

- A. Two (2) representatives from each semifinalist team report to the time and place stated in the conference program to sign-up for an interview.
- B. Up to six (6) semifinalist team representatives report at the assigned time and place for the interview.
- C. The top ten (10) finalists are announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRE-CONFERENCE

- A. Video Game:
 - 1. The game must be an online based game, or one that is a downloadable *.exe file, and accessible for evaluation by 11:59 p.m. ET on May 15th.
 - 2. Entries received, or changes made to submitted entries after this deadline will not be judged.

3. The URL must point to the team's entry. Entries that require a software download or request that access be granted will not be judged.
 4. Game instructions must be clear and understandable.
 5. Entries must be a team project and be the original work of the team.
 6. Judges must be able to play the game to the third (3rd) level.
 7. Game architecture, game engines, graphics, and sounds may be used from other sources.
 8. Work that is not created by the team must have proper documentation, showing copyright permissions and/or license for usage in the game segment included in the documentation portfolio.
 9. Bonus points may be awarded for exceptional game features or content.
- B. Documentation Portfolio:
1. Documentation materials (comprising a "portfolio") are required and must be submitted as a multi-page PDF document with pages in this order:
 - a. Title page with the event title, the title of the video, the conference city and state, and the year, and the team's identification number; one (1) page
 - b. A completed Student Copyright Checklist (see Forms Appendix).
 - c. A hand-drawn storyboard, which depicts the design concept of the video game; pages as needed.
 - d. Purpose and description of the game, the target audience, and a detailed explanation of how to play the game, including a list of control functions; two (2) pages.
 - e. Plan of Work Log (see Forms Appendix); pages as needed.
 - f. Permission letters for the use of copyrighted material; pages as needed (if applicable).
 - g. Required documentation becomes the property of TSA

EVALUATION

PRELIMINARY ROUND

- A. The first three (3) levels of the game
- B. The documentation portfolio
- C. Up to fifteen (15) bonus points may be added by the judges for exceptional game features, or for content showing exemplary educational and social value.

SEMIFINAL ROUND

- A. The interview

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Animator
- Computer programmer
- Electronic game designer
- Electronic game technician
- Writer

VIDEO GAME DESIGN

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

-
- ☐ The game is submitted and playable
- ☐ PDF of the documentation portfolio was submitted and scored
- ☐ ENTRY NOT EVALUATED

GAME DESIGN (80 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Creativity and Artisansh (X2)	The game lacks creativity; poor artisansh and development are evident.	The game exhibits adequate creativity and artisansh.	The game is highly creative and well crafted.	
Technical Skill (X2)	The game lacks originality and shows few technical skills.	The game is original and shows some evidence of programming skills.	The game is original, highly artistic, and shows evidence of programming skills.	
Storyline/Flow of the Game (X1)	The game follows little or no storyline; there is little to no logical flow to the game.	The game follows a storyline and flows adequately from one scene/level to another.	The game is well-organized and flows smoothly from one scene/level to the next.	
Overall Appeal (X3)	Playing the game is not enjoyable; interacting in game play is a struggle, due to the game's illogical sequencing.	The game is somewhat interesting, easy, and enjoyable to play; most design concepts are incorporated.	The game is innovative and entertaining; design principles are incorporated, which make playing the game easy and enjoyable.	
GAME DESIGN SUBTOTAL (80 points)				

DOCUMENTATION PORTFOLIO (20 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Game Directions and Control Functions (X1)	The game explanation is difficult to follow; functions provided are illogical or incorrect.	The game directions can be followed and generally sync with overall workings of the game; most control functions match the functions of the game.	The game explanation is easy to follow, and control functions clearly match the game functions.	
Storyboard (X1)	Storyboard is sloppy, disorganized, and incomplete and/or does not follow overall flow of the game design.	Storyboard is generally organized and includes aspects and overall scenes of the game.	Storyboard is complete, concise, neat, and follows the overall flow of the game.	
DOCUMENTATION SUBTOTAL (20 points)				

TIME DEDUCTIONS		
A deduction of five (5) points total will be incurred for a game that completes under the three (3) minute time minimum.		
Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.		
Indicate the rule violated: _____		

PRELIMINARY SUBTOTAL (100 points)	
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SEMIFINAL INTERVIEW (60 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Organization (X1)	Participants seem unorganized and unprepared for the interview; illogical explanation of the game is presented.	Participants are generally prepared for the interview; explanation of the game is communicated and generally organized.	The interview is logical, well organized, and easy to follow; the game explanation is communicated in an organized and concise manner.	
Knowledge (X2)	Participants seem to have little understanding of the concepts in their project; answers to questions may be vague.	Participants exhibit an understanding of the concepts in their project.	Participants show clear evidence of a thorough understanding of their project.	
Articulation (X1)	Communication of the design process is unclear, unorganized, and or illogical; leadership and/or 21 st century skills are not evident.	Communication of the design process is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the design process is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
Team Participation (X1)	The majority of the delivery is made by one (1) member of the team; the partner(s) may be disengaged in the interview.	Team members are somewhat engaged in the interview, though one (1) member may take on more responsibility than the other(s).	All team members are actively involved in the interview and responses to questions; there is shared responsibility among team members.	
Delivery (X1)	The team is verbose and/or uncertain in its interview; participants' posture, gestures, and lack of eye contact diminish the interview.	The team is somewhat well-spoken and distinct in its interview; participants' posture, gestures, and eye contact are acceptable in the interview.	The team is well-spoken and distinct in its interview; participants' posture, gestures, and eye contact result in a polished, natural, and effective interview.	
SEMIFINAL INTERVIEW SUBTOTAL (60 points)				

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.	
Indicate the rule violated: _____	

SEMIFINAL SUBTOTAL (60 points)	
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To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.	TOTAL (160 points)
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BONUS (10 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Bonus Points Unique and exceptional features (X1)	The game demonstrates some unique and exceptional features and/or exemplary educational value.	The game is very good but limited in uniqueness.	The game is outstanding and unique.	

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

VIDEO GAME DESIGN

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more (preferably the same judges from the preliminary round).

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Results envelope with coordinator forms
- B. Tables for entries
- C. One (1) extension cord for the semifinalist evaluation team
- D. One (1) power bar with surge protection for semifinalists, as needed
- E. Laptop computer with high speed Internet capability
- F. Tables and chairs for event coordinator, semifinalist judges, and participants

RESPONSIBILITIES

PRE-CONFERENCE

- A. National TSA will collect entries until 11:59 p.m. ET on May 15th and send out receipt confirmations to participants by June 10th. The results will be shared with the CRC manager, event coordinator, and assigned judges.
- B. Review entries as they are submitted to the designated online storage utility.
- C. Manage communication and pre-conference evaluation (at least two [2] or more judges should be recruited earlier in the year). Coordinate with the Judge Manager.
- D. Judges determine the twelve (12) semifinalists and discuss and break any ties.

- E. At least five (5) days prior to the National TSA Conference, make accessible the online storage utility link for the entries.
- F. Collect completed rating forms electronically and bring them to the conference on a flash drive.

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area or room in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.

PRELIMINARY ROUND

- A. On the first full day of the conference, post a list of the twelve (12) semifinalists in random order.
- B. Create a semifinalist sign-up sheet.

SEMIFINAL ROUND

- A. Semifinalist teams report at the time and place stated in the conference program to sign up for the interview.
- B. Up to six (6) representatives report at the assigned time and place for the interview.
- C. Manage completion of the interviews.
- D. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry
 The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- E. Judges determine the ten (10) finalists and discuss and break any ties.
- F. Submit the finalist results and all related forms in the results envelope to the CRC room.

OVERVIEW

Applying leadership and 21st century skills, participants are required to design, build, and launch a website that features the team's ability to incorporate the elements of website design, graphic layout, and proper coding techniques. The design brief for this event will be posted on the [TSA website](#) under Competitions/Themes and Problems. Semifinalists participate in an interview, with an emphasis on web design as it pertains to their solution, to demonstrate the knowledge and expertise gained during the design process.

ELIGIBILITY

One (1) team of at least three (3) individuals per chapter may participate.

TIME LIMITS

PRE-CONFERENCE/PRELIMINARY ROUND

- A. All components of the chapter's entry, including the website address (URL) for the entry, must be finished, submitted, and accessible via the Internet by 11:59 p.m. ET on May 15th.
- B. Email verification of each team's entry will be made by June 10th.

SEMIFINAL ROUND

- A. Up to ten (10) minutes is allowed for the interview.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants access the middle school event design brief from the [TSA website](#) under Competitions/Themes and Problems.
- B. Participants design a website while observing the theme and design requirements.

- C. The game entry and documentation must be submitted by 11:59 p.m. ET on May 15th.
- D. Submission information will be provided on the [TSA website](#) under Competition Updates.

PRELIMINARY ROUND

- A. A list of twelve (12) semifinalist teams (in random order) is posted on-site on the first full day of conference.

SEMIFINAL ROUND

- A. Participants report at the time and place stated in the conference program to sign-up for an interview.
- B. Participants report at the assigned time and place for the interview.
- C. Judges score the interviews.
- D. The top ten (10) finalists are announced at the awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRE-CONFERENCE/PRELIMINARY ROUND

- A. Participants must launch their entry on a web server that can be accessed via the Internet twenty-four (24) hours a day, seven (7) days a week, fifty-two (52) weeks per year.
- B. Each entry must consist of web pages that specifically display the chapter's solution to the middle school design brief.
- C. The URL must point to the main page of the team's entry. Entries that require a request for access be granted will not be judged.
- D. The solution to the design brief is developed as a series of web pages with a minimum of three (3) pages and no maximum of pages linked under the main design brief solution web page.

1. One (1) of the pages must list all sources of information used to create the website.
 2. All web pages must be completed during the current school year.
 3. If copyrighted material, such as text, images, or sound from other sources is used, proper written permission must be included/documented.
 4. Participants must submit a completed Student Copyright Checklist (in PDF format) as a link on their website reference page. (See Forms Appendix)
 5. Participants also must include a completed Plan of Work log (in PDF format) as a link on their website reference page. (See Forms Appendix)
- E. All entries must be compatible using the latest versions of Internet Explorer, Firefox, Chrome, etc. on both desktop and mobile devices.
- F. In addition to basic HTML code, the website may contain Java applets, HTML5, Shockwave, Flash, and other state-of-the-art web-based applications.
- G. Framework systems, such as Drupal, Joomla, Wordpress, Bootstrap, or other current technologies may be used; however, pre-built templates and themes for these sites are not permissible. If a framework system is used, a statement affirming that the template or theme used on the framework was built by the team must be posted on an "About" section or page.
- H. Template engine websites, such as, but not limited to, Webs, Wix, and Weebly are NOT permitted.
- I. The website must be finished, submitted, and accessible via the Internet by 11:59 p.m. EST on May 15th.
- J. Changes made after submission will result in disqualification from the event.

SEMIFINAL ROUND

- A. Up to six (6) team representatives must be prepared to discuss at a minimum:
1. overall website design and originality
 2. design brief
 3. The appropriate use of new Internet and web-based applications (different browsers, monitor resolution, plug-ins, etc.).

EVALUATION

PRELIMINARY ROUND

- A. The website

SEMIFINAL ROUND

- A. The interview

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Computer engineer
- Computer programmer
- Researcher
- Software designer
- Webmaster

WEBSITE DESIGN

2020 & 2021 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- ☐ Website URL that is functional on a desktop and mobile devices
- ☐ Design brief solution with no copyright or plagiarism issues
- ☐ ENTRY NOT EVALUATED

WEBSITE (90 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Content (X1)	Several inaccuracies occur in the information provided by students; the website does not align with the design brief criteria; not enough content is included, or content is very incomplete.	Most information provided by students on the website is applicable to the design brief criteria.	All information provided by students on the website is applicable to the design brief criteria.	
Layout (X1)	Web pages are cluttered looking or confusing; it is often difficult to locate important elements.	Web pages generally have an appealing and user friendly layout; it is easy to locate most important elements.	Web pages have an exceptionally attractive and user friendly layout; It is easy to locate all important elements; white space, graphics, and/or alignment are used effectively to organize material.	
Graphics (X1)	Graphics seem randomly chosen and are of low quality, and/or they distract the reader; many images are broken.	Graphics are related to the theme/ purpose of the site, are of good quality; graphics generally enhance the users interest or understanding; there may be a few broken images.	Graphics are related to the theme/ purpose of the site; graphics are thoughtfully cropped, exhibit high quality, and they enhance reader interest or understanding; there are no broken images.	
Navigation (X1)	Some links are missing and/or do not navigate to the pages described; a user typically feels lost.	Links for navigation are adequately labeled; they allow for easy movement from one page to related pages (forward and back), although user may become lost in some areas.	Links for navigation are clearly labeled, consistently placed, and allow for easy navigation from one page to related pages (forward and back); a user does not become lost.	
Color Scheme (X1)	Colors, fonts, and unvisited and visited links make the content hard to read or otherwise distracting.	Colors, fonts, and unvisited and visited links do not detract from the content and are somewhat consistent across pages.	Colors, fonts, and unvisited and visited links form a pleasing palette, complement the content, and are consistent across pages.	
Interest (X1)	Participants have provided only the minimum amount of information and have not transformed the information to make it more interesting to the targeted audience.	Participants have tried to make the content of the website interesting to the targeted audience.	Participants have made an exceptional attempt to ensure that the content of the website is interesting to the targeted audience.	

WEBSITE DEVELOPMENT (90 points) – continued				
Spelling and Grammar (X1)	There are many spelling and/or grammatical errors in the site.	There are a few spelling and/or grammatical errors in the site.	There are either no, or very minor, spelling or grammatical errors in the site.	
Solution to Design Brief (X2)	Website is missing three or more criteria and/or constraints of the design brief.	Website includes most criteria and/or constraints of the design brief.	Website includes all components of the design brief.	
WEBSITE SUBTOTAL (90 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				

PRELIMINARY SUBTOTAL (90 points)	
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SEMIFINAL INTERVIEW (50 points)				
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	Record scores in the column spaces below.
	1-4 points	5-8 points	9-10 points	
Organization (X1)	Participants seem unorganized and unprepared for the interview.	Participants are generally prepared and are somewhat organized for the interview.	Participants' interview is organized, logical, and easy to follow.	
Knowledge (X1)	Participants seem to have little understanding of the concepts in their project; answers to questions may be vague.	Participants exhibit an basic understanding of the concepts in their project.	Participants show clear evidence of a thorough understanding of the project.	
Articulation (X1)	Communication of the design process is unclear, unorganized, and or illogical; leadership and/or 21 st century skills are not evident.	Communication of the design process is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the design process is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
Team Participation (X1)	The majority of the delivery is made by one (1) member of the team; the partner(s) may be disengaged from the interview.	Team members are generally engaged in the process, though one (1) member may take on more responsibility than the other(s).	All team members are actively involved in the interview and responses to questions; there is shared responsibility among team members.	
Delivery (X1)	The team is verbose and/or uncertain in its interview; participants' posture, gestures, and lack of eye contact diminish the interview.	The team is somewhat well spoken and clear in its interview; participants' posture, gestures, and eye contact are acceptable in the interview.	The team is well-spoken and distinct in its interview; the participants' posture, gestures, and eye contact result in a polished, natural, and effective interview.	
SEMIFINAL INTERVIEW SUBTOTAL (50 points)				
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				

SEMIFINAL SUBTOTAL (50 points)To arrive at the **TOTAL** score, add any subtotals and subtract rules violation points, as necessary.**TOTAL (140 points)**

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

WEBSITE DESIGN

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator, one (1)
- B. Judges:
 - 1. Preliminary round, two (2) or more
 - 2. Semifinal round, two (2) or more

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Results envelope with coordinator forms
- B. The latest version of Internet Explorer, Firefox, Chrome, etc.
- C. List of questions for on-site interviews
- D. Laptop computer with high speed Internet capability

RESPONSIBILITIES

PRE-CONFERENCE

- A. National TSA will collect entries until 11:59 p.m. ET on May 15th and send out receipt confirmations to participants by June 10th. The results are shared with the CRC manager, event coordinator, and assigned judges.
- B. Review entries as they are submitted to the designated online storage utility.
- C. Manage communication and pre-conference evaluation (at least two [2] or more judges should be recruited earlier in the year). Coordinate with the Judge Manager.
- D. Judges determine the twelve (12) semifinalists and discuss and break any ties.
- E. At least five (5) days prior to the National TSA Conference, make accessible the online storage utility link for the entries.
- F. Collect completed rating forms electronically and bring them to the conference on a flash drive.

AT THE CONFERENCE

- A. Attend the mandatory event coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area or room in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.

PRELIMINARY ROUND

- A. On the first full day of the conference, post a list of the twelve (12) semifinalists in random order.
- B. Create a semifinalist sign-up sheet.

SEMIFINAL ROUND

- A. Semifinalists report at the time and place stated in the conference program to sign-up for an interview.
- B. Semifinalists report at the assigned time and place for the interview.
- C. Manage completion of the on-site interviews
- D. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round
 - 2. To disqualify the entry
 The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- E. Judges determine the ten (10) finalists and discuss and break any ties.
- F. Submit the finalist results and all related forms in the results envelope to the CRC room.

FORMS

APPENDIX

Downloadable forms are available on the
[TSA website](#) under Competition/Competition Forms.

TECHNOLOGY STUDENT ASSOCIATION PLAN OF WORK LOG				
Date	Task	Time involved	Team member responsible (student initials)	Comments
1.				
2.				
3.				
4.				
5.				
6.				

Advisor signature _____



STUDENT COPYRIGHT CHECKLIST (for students to complete and advisors to verify)

STUDENT: Answer question 1 below.

- 1) Does your solution to the competitive event integrate any type of music and/or sound? ☐ YES ☐ NO

If NO, go to question 2.

If YES, is the music and/or sound copyrighted? ☐ YES ☐ NO

If YES, move to question 1A. If NO, move to question 1B.

1A) Have you asked for author permission to use the music and/or sound in your solution and included that permission (letter/form) in your documentation? If YES, move to question 2. If NO, ask for permission and if permission is granted, include the permission in your documentation.

1B) Is the music/sound royalty free, or did you create the music/sound yourself? If YES, cite the royalty free music/sound OR your original music/sound properly in your documentation.

CHAPTER ADVISOR: Sign below regarding your student's answer(s) to the use of music/sound in his/her competitive event solution. Even if your student answers "NO" to question 1, please sign below noting that you have evaluated the competitive event solution and the student answered the question(s) accurately.

I, _____ (chapter advisor), have checked my student's solution and confirm that any use of music/sound is done so with proper permission and is cited correctly in the student's documentation and/or the solution has been found to have no music/sound included.

STUDENT: Answer question 2 below.

- 2) Does your solution to the competitive event integrate any graphics/videos? ☐ YES ☐ NO

If NO, go to question 3.

If YES, is(are) the graphics/videos copyrighted, registered and/or trademarked? ☐ YES ☐ NO

If YES, move to question 2A. If NO, move to question 2B.

2A) Have you asked for author permission to use the graphics and/or videos in your solution and included a permission (letter/form) in your documentation for graphic/video used? If YES, move to question 3. If NO, ask for permission and if permission is granted, include the permission in your documentation.

2B) Is(are) the graphics/videos royalty free, or did you create your own graphic? If YES, cite the royalty free graphics/videos OR your own original graphics/videos properly in your documentation.

CHAPTER ADVISOR: Sign below regarding your student's answer(s) to the use of graphics/videos in his/her competitive event solution. Even if your student answers "NO" to question 2, please sign below noting that you have evaluated the competitive event solution and the student answered the question(s) accurately.

I, _____ (chapter advisor), have checked my student's solution and confirm that the use of graphics/videos with proper permission and is cited correctly in the student's documentation and/or the solution has been found to have no graphics/videos included.

STUDENT: Answer question 3 below.

- 3) Does your solution to the competitive event use another's thoughts or research? ☐ YES ☐ NO

If NO, this is the end of the checklist.

If YES, have you properly cited other's thoughts or research in your documentation? ☐ YES ☐ NO

CHAPTER ADVISOR: Sign below regarding your student's answer(s) to having integrated any thoughts/research of others in his/her competitive event solution. Even if your student answers "NO" to question 3, please sign below noting that you have evaluated the competitive event solution and the student answered the question(s) accurately.

I, _____ (chapter advisor), have checked my student's solution and confirm that the use of the thoughts/research of others is done so with proper permission and is cited correctly in the student's documentation and/or the solution has been found to have all original thought with no use of other's thoughts/research.

PHOTO/FILM/VIDEO CONSENT AND RELEASE

I hereby give permission for images of my child or myself (as applicable), captured during Technology Student Association (TSA) activities through film, photo or digital camera, to be used solely for the purposes of TSA promotional materials and publications, and I waive any rights of compensation or ownership thereto.

Name of Minor in Images (please print)

Name of Minor's Parent/Guardian (please print)

Name of Adult in Images (please print)

Parent/Guardian or Adult's Signature (as applicable)

Date

NEW COMPETITIVE EVENT PROPOSAL

New proposals may only be submitted by chapter advisors of currently affiliated chapters or TSA alumni. Please attach any additional pages as necessary.

Name of Competitive Event: _____

Level: ☐ High School ☐ Middle School

Overview (description of the event and participant expectations):

Eligibility for entry (how many teams/individuals can participate):

Limitations (such as time or entry submission requirements):

Resources (i.e. are the resources a limiting factor, or are they affordable/readily available to all populations? Can this be executed at the national level?):

Specific regulations:

Required personnel:

Alignment with STEM standards (how does this align with STEM standards?):

What are the societal benefits for learning this information? How can this be applied in a real world context?

Do you know of a TSA Chapter, at the regional or state level, that executes this event at conferences? If so, whom?

Name Date

Email Phone Number

How are you affiliated with TSA? ☐ Chapter Advisor ☐ Alumni ☐ Other: _____

Mail to: CRC, c/o National TSA, 1904 Association Drive, Reston, VA 20191-1540; Email to: general@tsaweb.org

EVENT REVISION SUGGESTION

As TSA expands its membership and participation in competitive events increases, competitive events may require revision. TSA consistently tracks and monitors misinterpretations and strives to revise the guide to improve clarity. TSA encourages input so that competitive events continue to improve. Use this form to note how outcomes for competitive events may be improved.

Competitive Event: _____

Level: ☐ High School ☐ Middle School

Note a reference to the exact section and page number (if applicable): _____

Specifically state the suggestion. List exactly what should be deleted, replaced, and/or added to the event rule or procedure.

Provide a rationale and list the pros and cons of this proposed update.

In your opinion, will the update to this event change the space requirements at the conference? ☐ YES ☐ NO

If yes, provide your rationale.

In your opinion, will the update to this event require additional resources? ☐ YES ☐ NO

If yes, provide your rationale.

Enter any additional comments

Print Name Signature Date

State Advisor's Name Signature Date

Contact Email Contact Phone

Mail to: CRC, c/o National TSA, 1904 Association Drive, Reston, VA 20191-1540; Email to: general@tsaweb.org

RULES INTERPRETATION PANEL GRIEVANCE

Site of National TSA Conference _____

Advisor's Name _____

Chapter Name _____

School Name _____

Competitive Event (including level) _____

Student or Team Identification Number _____

STATEMENT OF CONCERN (Please print or type.)

Signature of Advisor Date

Signature of State Advisor Date

The decisions of the Rules Interpretation Panel (RIP) at the National Conference are final.

RULES INTERPRETATION PANEL RESPONSE TO GRIEVANCE

PANEL MEMBERS

Signature

Date

Signature

Date

Signature

Date

Site of National TSA Conference _____

Date _____

Competitive Event (including level) _____

Student or Team Identification Number _____

Advisor's Name _____

STATEMENT OF RESPONSE

The decisions of the Rules Interpretation Panel (RIP) at the National Conference are final.