Participant Guide to
STEM ADVENTURE WEEKEND 2020

Online Classes: September 25-26, 2020
Possible Camp Classes: September 27, 2020

Science, Technology, Engineering & Math
Merit badges and Nova awards
for Scouts BSA, Venturers, and Sea Scouts
Capitol Area Council, Austin, TX
https://bsastemnova.org

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WELCOME TO STEM ADVENTURE WEEKEND 2020

STEM Adventure Weekend is hosted by the volunteer STEM Nova Committee of the Capitol Area Council, Austin, TX.

For 2020, the committee pledges to continue scouting under these extraordinary circumstances and to offer scouting opportunities as best we can. All online classes will be taught via the Zoom video conference application by the same expert instructors as in the past.

The purpose of this weekend is to provide Scouts opportunities to explore scouting in a STEM-focused camp environment. Plan to have fun and work hard.

“STEM is part of an initiative the Boy Scouts of America has taken on to encourage the natural curiosity of youth members and their sense of wonder about these fields through existing programs.”

http://www.scouting.org/stem/AboutSTEM.aspx

BSA NOVA Awards

Classes at STEM Adventure Weekend are a part of the Nova award program.

“The Boy Scouts of America developed the Nova Awards program to excite and expand a sense of wonder in our Scouts. By working with an adult counselor or mentor, the various modules allow them to explore the basic principles of STEM and discover how fun and fascinating STEM can be. The Supernova awards are offered for those who enjoy a super challenge. For more information about STEM and the Nova Awards program, visit www.scouting.org/stem. Discover how the Nova Awards program helps youth be "Prepared. For Life."”

http://www.scouting.org/stem/AboutSTEM.aspx
Online Classes

Register here: https://bsacac.doubleknot.com/event/steam-adventure-weekend/2721265

Scouts may choose up to 4 online classes for the 2020 STEM Adventure Weekend from a choice of seventeen. Classes are $18 each.

All instructors are registered merit badge counselors and professionals or serious hobbyists in the field they are teaching.

Classes are hosted on the council’s Zoom video conference platform. Each class period is allocated up to 4 hours, however most classes are expected to finish within 3 hours.

Please contact staff if you have questions.

<table>
<thead>
<tr>
<th>Location</th>
<th>class 1</th>
<th>class 2</th>
<th>class 3</th>
<th>class 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoom</td>
<td>Friday 9/25 6-10p</td>
<td>Saturday 9/26 8a-12p</td>
<td>Saturday 9/26 1p-5p</td>
<td>Saturday 9/26 6-10p</td>
</tr>
<tr>
<td>Room 1</td>
<td>Digital Technology</td>
<td>-</td>
<td>Programming</td>
<td>Electricity</td>
</tr>
<tr>
<td>Room 2</td>
<td>-</td>
<td>Electronics</td>
<td>Composite Materials</td>
<td>-</td>
</tr>
<tr>
<td>Room 3</td>
<td>Nova Shoot</td>
<td>Space Exploration</td>
<td>Model Design &amp; Building</td>
<td>Radio</td>
</tr>
<tr>
<td>Room 4</td>
<td>Nova Mendel's Minions</td>
<td>Nova Splash</td>
<td>Insect Study</td>
<td>Nova Grow</td>
</tr>
<tr>
<td>Room 5</td>
<td>Nuclear Science</td>
<td>Oceanography</td>
<td>Nova Whoosh</td>
<td>Astronomy</td>
</tr>
</tbody>
</table>

Possible Camp Classes

The STEM Nova committee has reserved Sunday, September 27 for potentially holding a few in-person classes at camp (Lost Pines Scout Reservation, Bastrop, TX) to finish up merit badge requirements. These classes are noted in the “Class Requirements” table below.

Holding in-person classes is subject to council and county approvals which may not be decided for several weeks.

If and when this approval is given, the committee will announce a separate registration, fees, and guidelines for this opportunity as soon as possible.
Class Requirements

Given the nature of many STEM merit badge and Nova classes, not all requirements may be covered in a single class period. Requirements listed in the homework column may be completed beforehand and discussed with your counselor if they have time. Most counselors have agreed to continue working with scouts to complete requirements after camp.

Please see Appendix A for additional details about each class.

All Nova awards include 3 hours of reading/watching about the topic (requirement 1) and the completion of a topic-specific merit badge (requirement 2).

Requirements for classes that would be covered at an in-person event on Sunday at camp, if allowed, are marked in red.

<table>
<thead>
<tr>
<th>Class</th>
<th>Covered</th>
<th>Not covered / Homework</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astronomy</td>
<td>1, 2, 3, 4cd, 5, 6acd, 7, 9</td>
<td>4ab, 6b, 8</td>
</tr>
<tr>
<td>Composite Materials</td>
<td>1, 2, 3, 4, 6</td>
<td>5abc</td>
</tr>
<tr>
<td>Digital Technology</td>
<td>All*</td>
<td>*Cyber chip pre-requisite</td>
</tr>
<tr>
<td>Electronics</td>
<td>1, 2, 3c, 4, 5, 6</td>
<td>3ab</td>
</tr>
<tr>
<td>Electricity</td>
<td>All</td>
<td>-</td>
</tr>
<tr>
<td>Insect Study</td>
<td>1,2,3,4,6b,7,8,10,11,12,13</td>
<td>5,6a,9</td>
</tr>
<tr>
<td>Model Design &amp; Building</td>
<td>1, 2, 3, 6</td>
<td>4, 5</td>
</tr>
<tr>
<td>NOVA Let it Grow!</td>
<td>3, 4, 5, 6</td>
<td>1, 2</td>
</tr>
<tr>
<td>NOVA Mendel’s Minions</td>
<td>3, 5, 6</td>
<td>1, 2, 4</td>
</tr>
<tr>
<td>NOVA Shoot!</td>
<td>3b, 4b1, 5a, 6</td>
<td>1, 2, 4b2</td>
</tr>
<tr>
<td>NOVA Splash!</td>
<td>3, 4, 5, 6</td>
<td>1, 2</td>
</tr>
<tr>
<td>NOVA Whoosh!</td>
<td>3, 4, 5, 6</td>
<td>1, 2</td>
</tr>
<tr>
<td>Nuclear Science</td>
<td>All</td>
<td>-</td>
</tr>
<tr>
<td>Oceanography</td>
<td>1, 2, 3, 4, 5, 6, 9</td>
<td>7a, 8</td>
</tr>
<tr>
<td>Programming</td>
<td>All*</td>
<td>*Cyber chip pre-requisite</td>
</tr>
<tr>
<td>Radio</td>
<td>All</td>
<td>-</td>
</tr>
<tr>
<td>Space Exploration</td>
<td>1, 4, 5a, 6, 8</td>
<td>2, 3, 5bc, 7</td>
</tr>
</tbody>
</table>

A few classes will have optional materials kits available for purchase if/when registration for in-person classes is allowed. These kits will help scouts complete some of the homework requirements.

Note for Venturers and Sea Scouts: The Nova classes listed above are the names for Scouts BSA. See the last page of the class descriptions (Appendix A) for the equivalent Nova awards for your level.
Additional Requirements

Scouts and units from other councils are welcome to participate in the Capitol Area Council online STEM Adventure Weekend.

Scouts do not need to be First Class or 14 years old to attend, but it is imperative that all attendees have the maturity to be attentive and engaged in the interactive environment that is created by the merit badge counselors for the length of the class. It is essential that the Scouts themselves are capable of performing all requirements without parental assistance.

Youth Protection

All online classes will be conducted with at least two adult volunteers (instructor and monitor). Adults will monitor scout activity and will call parents if there is no participation or non-scout-like behavior. No credit will be given to a scout who does not participate. No refunds will be issued if a scout does not participate or is removed for inappropriate behavior.


STEM Gear

Purchase STEM Nova t-shirts for $15 during online registration. The design is shown below. The color of the shirts is Blue-Grey as shown in the left photo.
Uniform

While wearing the field uniform is always appropriate, it is not required for STEM Adventure Weekend. STEM t-shirts (activity uniform) are available while supplies last. Any Scout-appropriate clothing is acceptable.

Electronic Completion Report

Blue cards will not be provided or signed for STEM Adventure Weekend. Each Scout will receive an Electronic Completion Report generated by the Doubleknot registration system.

This report is a record of a Scout’s progress in the pursuit of completing merit badges and Nova awards. The instructor will call roll at the beginning of each class. After the class, the instructor will turn in the class list and requirements completed. A printed copy of the report will be provided at checkout. The electronic completion report should be turned in to your unit leader for proper recording of your achievements during the STEM Adventure Weekend.

Instructions on how to access these reports is:

1. Log into Doubleknot
   (https://bsacac.doubleknot.com/Rosters/logon.aspx?)
2. Click on My Account (top right corner below Capitol Area Council logo).
3. Click on the Registrations tab
4. Here you will see all your registrations. On the bar with NOVA/STEM Adventure Weekend 2020, you can click on Reports under the Action column.
5. Click on the Class/Activity Completion Award link
6. Click on print and select print as a pdf. Now you can save the file and email it to the Scoutmaster, Advancement Chair and/or anyone who needs it for a record.

The Electronic Completion Report may not track all of the newer Nova requirements. If you encounter issues with official recording at your unit, please contact staff.
**Additional**

Participants will be notified as soon as possible of any class changes.

During STEM Adventure Weekend we will:

- Follow Scouting methods, skills, procedures, and values
- Demonstrate youth-led program segments
- Introduce people to a wider variety of Scouting topics
- Provide Scouts and Scouters an opportunity to engage with each other
- Deliver a fun camping experience
- Foster enthusiasm in STEM

**Capitol Area Council contact information:**

<table>
<thead>
<tr>
<th>Primary Staff Contact: Jessica Snider, Director of STEM, Conservation and Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>office: 512-617-8651, cell: 512-632-9395</td>
</tr>
<tr>
<td><a href="mailto:jessica.snider@scouting.org">jessica.snider@scouting.org</a></td>
</tr>
</tbody>
</table>

Main reception desk 512-617-8611

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Appendix A – Class Details

**MERIT BADGES**

https://www.scouting.org/programs/scouts-bsa/advancement-and-awards/merit-badges/

### Astronomy

https://filestore.scouting.org/filestore/Merit_Badge_ReqandRes/Astronomy.pdf  
http://usscouts.org/mb/worksheets/astronomy.pdf  

Homework:  
4ab – identify constellations and stars in the night sky  
6b – sketch the Moon for four nights  
8 – observation options  

Class materials:  
- paper and pen or pencil  
- Optional: binoculars or telescope

### Composite Materials


Homework:  
5abc – do two projects  

Class materials:  
- paper and pen or pencil  
For requirements 5abc, a composites kit will be available for purchase if/when an in-person event is possible.

### Digital Technology


Pre-requisite:  
- Scouts must have completed Cyber Chip prior to class.

Homework:  
None.

Class materials:  
- paper and pen or pencil  
- access to a computer (not just a smart phone or tablet)
Electronics
https://filestore.scouting.org/filestore/Merit_Badge_ReqandRes/Electronics.pdf
http://usscouts.org/mb/worksheets/Electronics.pdf
Homework:
  3ab – soldering project
Class materials:
  paper and pen or pencil
  For requirements 3ab, an electronics kit will be available for purchase if/when an in-person event is possible.

Electricity
https://filestore.scouting.org/filestore/Merit_Badge_ReqandRes/Electricity.pdf
http://usscouts.org/mb/worksheets/Electricity.pdf
Homework:
  None
Class materials:
  paper and pen or pencil

Insect Study
https://filestore.scouting.org/filestore/Merit_Badge_ReqandRes/Insect_Study.pdf
http://usscouts.org/mb/worksheets/Insect-Study.pdf
Pre-requisite:
  Watch an ant colony video. Specific link will be sent after registration.
Homework:
  5 – observe insects and make scrapbook
  6a – identification from scrapbook
  9 – raise an insect
Class materials:
  paper and pen or pencil

Model Design and Building
https://filestore.scouting.org/filestore/Merit_Badge_ReqandRes/ModelDesign_and_Building.pdf
Homework:
  4 & 5 – build models
Class materials:
  paper and pen or pencil
  For requirements 4 & 5, any materials such as recycled cardboard may be used. These requirements may be completed if/when an in-person event is possible.
Nuclear Science
https://filestore.scouting.org/filestore/Merit_Badge_ReqandRes/Nuclear_Science.pdf
Homework:
  None.
Class materials:
  paper and pen or pencil

Oceanography
https://filestore.scouting.org/filestore/Merit_Badge_ReqandRes/Oceanography.pdf
http://usscouts.org/mb/worksheets/Oceanography.pdf
Homework:
  7 – do one (many options)
  8 – report or speech
Class materials:
  paper and pen or pencil
  Requirements 7a (plankton net) and 8 may be completed if/when an in-person event is possible.

Programming
https://filestore.scouting.org/filestore/Merit_Badge_ReqandRes/Programming.pdf
http://usscouts.org/mb/worksheets/Programming.pdf
Pre-requisite:
  Scouts must have completed Cyber Chip prior to class.
Homework:
  None.
Class materials:
  paper and pen or pencil
  access to a computer (not just a smart phone or tablet)

Radio
Homework:
  None.
Class materials:
  paper and pen or pencil
Space Exploration

https://filestore.scouting.org/filestore/Merit_Badge_ReqandRes/Space_Exploration.pdf

Homework:
- 2 – design a collector's card
- 3 – build, launch, and recover a model rocket
- 5b – make a scrapbook or 5c – design a robotic mission
- 7 – design an inhabited base

Class materials:
- paper and pen or pencil
For requirement 3, a model rocket kit will be available for purchase if/when an in-person event is possible.
Requirements 2, 3, 5c, and 7 may be completed if/when an in-person event is possible.
Optional: you may purchase a model rocket kit from scoutshop.org

Rocket multi-packs, rocket engines, and a launch set are also available.
NOVA AWARDS
https://www.scouting.org/stem-nova-awards/awards/

All of the NOVA Awards require parts 1 and 2 be completed outside of class time.
  * Requirement 1 is to read, watch or in some combination total 3 hours of the STEM area covered, make a list of questions, and discuss with your counselor.
  * Requirement 2 is to compete one of the merit badges that are listed for that award and discuss with your counselor.

The discussion portions of 1 and 2 may be possible to complete before, during, or after camp at the discretion of your instructor.

NOVA Let it Grow!
Pre-requisite:
  * Watch a farm tour video. Specific link will be sent after registration.

Homework:
  1 – read or watch 3 hours about agriculture or farming
  2 – compete one of the following merit badges: Animal Science, Cooking, Farm Mechanics, Fish and Wildlife Management, Fishing, Forestry, Gardening, Insect Study, Mammal Study, Nature, Plant Science, Soil and Water Conservation

Class materials:
  * paper and pen or pencil

NOVA Mendel’s Minions
Homework:
  1 – read or watch 3 hours about genetic or genomics
  2 – compete one of the following merit badges: Animal Science, Bird Study, Forestry, Gardening, Insect Study, Mammal Study, Medicine, Nature, Public Health, Reptile and Amphibian Study, Veterinary Medicine
  4 – present a report

Class materials:
  * paper and pen or pencil
NOVA Shoot!
Homework:
1 – read or watch 3 hours about projectiles, aviation, weather, astronomy, or space technology
2 – compete one of the following merit badges: Archery, Astronomy, Athletics, Aviation, Game Design, Rifle Shooting, Robotics, Shotgun Shooting, Space Exploration, Sustainability, Weather
4b2 – watch a satellite
Class materials:
  paper and pen or pencil
To complete requirement 5a, please have these materials or similar on hand:
  7 wooden skewers/sticks/pencils, 5 marshmallows, a plastic spoon, masking tape, and a rubber band

NOVA Splash!
Pre-requisite:
  Watch a water usage video. Specific link will be sent after registration.
Homework:
1 – read or watch 3 hours about agriculture or farming
Class materials:
  paper and pen or pencil

NOVA Whoosh!
Homework:
1 – read or watch 3 hours about agriculture or farming
2 – compete one of the following merit badges: Archery, Aviation, Composite Materials, Drafting, Electronics, Engineering, Inventing, Mining in Society, Model Design and Building, Railroading, Rifle Shooting, Robotics, Shotgun Shooting
Class materials:
  paper and pen or pencil
NOVA Equivalencies between Scouts BSA and Venturing/Sea Scouting

The table below lists Scouts BSA Novas and their approximately equivalent Nova for Venturing and Sea Scouting. For the full list of Venturing/Sea Scouting requirements, see https://www.scouting.org/stem-nova-awards/awards/venturer/

For STEM Adventure Weekend 2020, Shoot!, Splash!, and Whoosh! have equivalent classes: choose the appropriate match for the Nova you wish to start and make sure you register as a Venturer/Sea Scout. The instructor will help you with any additional requirements that may be different for your program level.

<table>
<thead>
<tr>
<th>Class at SAW20</th>
<th>Scouts BSA Nova</th>
<th>Venturing/Sea Scouting Nova</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>Shoot!</td>
<td>Launch!</td>
</tr>
<tr>
<td>YES</td>
<td>Let it Grow!</td>
<td>-</td>
</tr>
<tr>
<td>YES</td>
<td>Splash!</td>
<td>Wade!</td>
</tr>
<tr>
<td>YES</td>
<td>Mendel’s Minions</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>What a Life</td>
</tr>
<tr>
<td>-</td>
<td>Start Your Engines!</td>
<td>Power Up</td>
</tr>
<tr>
<td>-</td>
<td>Hello World</td>
<td>Execute</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>Something from Nothing</td>
</tr>
<tr>
<td>YES</td>
<td>Whoosh!</td>
<td>Hang On!</td>
</tr>
<tr>
<td>-</td>
<td>Up and Away</td>
<td>Up and Away</td>
</tr>
<tr>
<td>-</td>
<td>Next Big Thing</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>Designed to Crunch</td>
<td>Numbers Don’t Lie</td>
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</tbody>
</table>