

SPACEGATE STATION VIDEO SERIES

AURORA STATION



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Episode Summary

Aurora Station – Opening Sequence A Starfleet vessel detects an unknown ship broadcasting an old Earth Morse-code distress call. The crew is surprised; it appears to be an Earth vessel even though no ships have traveled in that sector for years. This cold-open sets up the mystery of a derelict DY-100 class ship drifting in deep space. (Example line: *“Captain, that’s the old Morse code call sign.”*)

Arrival at Aurora Station - The USS Defiant delivers a new group of CSO cadets to Aurora Station, a Starfleet Academy frontier training facility commanded by Captain O’Shea. The cadets (Maya, Layla, and Jordan) are introduced as a mismatched but promising team. They meet Argus, the station’s experimental AI, who assigns their first task: Calibrate the long-range sensor array.

The Calibration Disaster - The cadets attempt to tune the sensors, but Jordan’s impulsive button-pressing and attempts to “boost the gain” cause a power surge, frying ODN relays and taking the entire sensor grid offline. (Example line: *“Power surge detected. Sensor grid offline.”*) Captain O’Shea orders them to fix the system as a team. Jordan climbs into a cramped conduit to manually secure a bypass while Maya and Layla reroute power. Despite the danger, they restore the grid successfully. Argus rewards them with replicated Klingon roast targ, to the cadets’ horror.

Discovery of the Anomalous Signal - Once the sensors are restored, the cadets detect a strange audio signal at maximum range. It’s faint, distorted, and unfamiliar. Captain O’Shea reviews the data and confirms the anomaly is real, and not part of the training exercise. A visual projection reveals the object: An old Earth DY-100 pre-warp vessel, centuries old and far from where it should be.

Cadet Initiative... and Rule-Breaking - Frustrated that the Enterprise will get credit for the discovery, the cadets secretly disable Argus’s monitoring and send the ship’s trajectory data to Section 31, believing it will earn them recognition. Layla wipes the transmission logs before Argus comes back online.

Closing Themes - Captain O’Shea praises the cadets for their teamwork, courage, and growth—while reminding them that failure is part of learning and that recklessness must be tempered with discipline. (Example line: *“Failure is inevitable, cadet. It’s not about avoiding it, but how you deal with it.”*) The episode ends with Enterprise preparing to investigate the derelict ship, while the cadets return to their duties, proud, mischievous, and already bonded as a team.

Core Themes for Instruction

- Teamwork under pressure
- Scientific troubleshooting and systems thinking
- Consequences of impulsive decision-making
- Ethics: unauthorized transmissions, secrecy, chain of command
- Growth mindset: learning through mistakes

Florida Standards Alignment

Nature of Science (NOS)

- **SC.7.N.1.1** – Define a problem, collect data, analyze information, and communicate results.
- **SC.6.N.1.5** – Recognize that data may not support a hypothesis.
- **SC.8.N.1.6** – Scientific investigations involve multiple methods.
- **SC.912.N.1.1** – Scientific inquiry, problem-solving, and communication.
- **SC.912.N.1.3** – Evaluate the merits of scientific arguments.
- **SC.912.N.4.1** – Science and technology are interdependent.

Physical Science

- **SC.7.P.10.3** – Energy transfer and transformations.
- **SC.7.P.11.2** – Electrical energy and circuits.
- **SC.6.P.11.1** – Energy transformations.
- **SC.912.P.10.1** – Energy forms and transformations.
- **SC.912.P.10.13** – Electric circuits and power systems.

Earth & Space Science

- **SC.8.E.5.3** – Distances in space and detection methods.
- **SC.8.E.5.10** – Objects in the solar system and beyond.
- **SC.912.E.5.4** – Tools used to study space.
- **SC.912.E.5.9** – Space exploration technologies.

Engineering & Technology

- **SC.6.N.1.4** – Use tools to gather and analyze data.
- **MA.912.DP** – Interpreting sensor data.
- **Engineering & Technology (9410110, 8600550)** – Troubleshooting, system repair, diagnostics.
- **Computer Systems & Information Technology** – Human-AI interaction, system logs, cybersecurity.

Computer Science

- **CS.912.CS.1.4** – Evaluate computing systems.
- **CS.912.CS.2.5** – Troubleshooting hardware/software.
- **CS.912.CS.3.3** – Data representation and transmission.

Lesson Plan: "Aurora " – Science & Engineering Integration

Objective

Students will analyze scientific concepts presented in the *Aurora Station* video, identify real-world science principles, and connect them to Florida science standards.

Materials

- *Aurora Station* video https://youtu.be/UMAmq_PJmk4
- Student guide and glossary
- Discussion question sheet
- Hands on Troubleshooting Challenge

Procedure

Engage (10 min) **SC.7.N.1.1; SC.912.N.1.1**

- Play the opening scene of *Aurora Station*.
- Ask students what scientific systems they notice (sensors, power grids, AI, etc.).

2. Explore (15 min) **SC.6.P.11.1; SC.7.P.10.3; SC.8.E.5.10; SC.8.E.5.1**

- Students work in groups to identify scientific concepts in the video.
- Groups list examples of energy transfer, sensor technology, or space science.

3. Explain (15 min) **SC.912.N.1.3; SC.7.N.1.3; SC.912.N.4.1**

- Teacher connects student observations to Florida standards.
- Highlight Nature of Science practices shown by the cadets.

4. Elaborate (20 min) **CS.912.CS.2.5; SC.6.N.1.4; SC.912.P.10.13**

- Students choose one system (sensor grid, EPS conduit, AI monitoring) and create a diagram explaining how it works.

5. Evaluate (10 min) **SC.7.N.1.1; SC.912.N.1.1**

- Students answer discussion questions.
- Teacher checks for understanding.

Discussion Questions (Aligned to First Five Science Areas) – sample responses can be found in the teacher suggested answer key on next page

Nature of Science (SC.7.N.1.1; SC.6.N.1.5; SC.8.N.1.6; SC.912.N.1.1)

1. How did the cadets use scientific inquiry to solve the power surge problem?
2. What mistakes did they make, and how did they learn from them?

Physical Science (SC.7.P.11.2; 1; SC.7.P.10.3; SC.6.P.11.1; SC.912.P.10.1)

3. What caused the power surge, and how does this relate to real electrical circuits?
4. How does energy transfer occur in the EPS conduits?

Earth & Space Science (SC.8.E.5.3; SC.8.E.5.10; SC.912.E.5.4; SC.912.E.5.9)

5. Why would a faint signal be difficult to detect in an asteroid field?
6. What tools do scientists use today to detect distant objects in space?

Engineering & Technology (SC.6.N.1.4; SC.912.N.4.1)

7. What engineering skills did the cadets use to repair the sensor grid?
8. How does troubleshooting in the story compare to real-world engineering?

Computer Science (CS.912.CS.1.4; CS.912.CS.3.3; CS.912.CS.2.5)

9. How does Argus function as an AI system, and what limitations does it show?
10. Why is cybersecurity important when the cadets bypass the comms firewall?

Teacher Notes

- This lesson works well in STEM, Earth/Space Science, Physical Science, or Technology courses.
- The script provides strong opportunities for cross-curricular integration with ELA and Computer Science.

Add a Safety & Ethics Component

The cadets bypass a firewall and secretly transmit data. This is a perfect moment to teach:

- Cybersecurity
- Responsible use of technology
- Ethical decision-making in STEM

Discussion Questions Sample Response Key

1. How did the cadets use scientific inquiry to solve the power surge problem?

They observed the system failure, analyzed the damage to the EPS conduit and ODN relays, developed a plan to reroute power, tested the solution by installing a bypass module, and confirmed the system was restored.

2. What mistakes did they make, and how did they learn from them?

They overloaded the system by ignoring warnings and acting without teamwork. They learned the importance of communication, following procedures, and working together to fix problems.

3. What caused the power surge, and how does this relate to real electrical circuits?

The surge was caused by increasing sensor gain too much, which overloaded the system. This is like real circuits where too much current can cause overheating, damage, or blown fuses.

4. How does energy transfer occur in the EPS conduits?

Energy moves through the conduits as plasma and is distributed to systems. It must be carefully regulated to prevent overloads and maintain stability.

5. Why would a faint signal be difficult to detect in an asteroid field?

Signals can be weakened or blocked by rocks, dust, and interference from electromagnetic noise, making them hard to detect.

6. What tools do scientists use today to detect distant objects in space?

Scientists use radio telescopes, optical telescopes like Hubble and James Webb, spectrometers, satellites, and computer analysis systems.

7. What engineering skills did the cadets use to repair the sensor grid?

They used troubleshooting, system analysis, hands-on repair skills, teamwork, and risk management to fix the system.

8. How does troubleshooting in the story compare to real-world engineering?

It follows the same process: identify the problem, diagnose the cause, design a solution, test it, and adjust as needed. Real engineers also emphasize safety and teamwork.

9. How does Argus function as an AI system, and what limitations does it show?

Argus monitors systems, provides data, and gives warnings, but cannot stop human mistakes and can be bypassed, showing security and control limitations.

10. Why is cybersecurity important when the cadets bypass the comms firewall?

Cybersecurity protects systems and data. Bypassing the firewall shows how vulnerabilities can allow unauthorized access and hidden actions, which can be dangerous.

Discussion Questions Rubric

Criteria	4 - Exceeds	3 - Meets	2 - Developing	1 - Beginning
Understanding	Clear and accurate	Correct	Partial	Incorrect
Evidence	Strong examples	Some examples	Limited	None
Depth	Insightful reasoning	Logical	Basic	Minimal
Clarity	Clear and organized	Mostly clear	Some confusion	Unclear

Name: _____ period: _____ date: _____

Aurora Station Student Worksheet

1. Engage — Opening Scene (00:00:09–00:04:16)

A. What scientific systems do you notice in the opening scene?

B. At 00:00:27, a character asks about “sensor readings.” What do you think sensors are used for on a space station?

C. At 00:02:14, the Defiant contacts Aurora Station. What communication technology do you think they are using?

2. Explore — Identifying Science Concepts (00:04:16–00:07:14)

A. At 00:05:08, the cadets receive their first assignment. What scientific task are they asked to complete?

B. At 00:06:01–00:06:22, the cadets talk about interference. List two types of interference mentioned.

C. Based on the video, what challenges might occur when calibrating sensors?

3. Explain — Science Practices in Action (00:07:14–00:09:27)

A. At 00:07:53, Argus gives a probability of system failure. What science skills are being used here?

- Observation
- Data analysis
- Prediction
- Communication

B. At 00:08:17, the sensor grid goes offline. What do the cadets do next that shows teamwork?

C. How does this scene show the Nature of Science?

4. Elaborate — System Diagram (00:09:27–00:12:23)

A. Choose one system shown in the video: (Diagram example of EPS conduct in Fictional Glossary)

- Sensor grid
- ODN relay network
- Power bypass module

B. Draw a diagram of the system you chose.

C. Explain how your system works in 2–3 sentences.

5. Evaluate — Reflection (00:12:23–00:15:15)

A. At 00:13:05, the commander says the cadets “made a problem but solved it.” What does this tell you about scientific work?

B. At 00:14:51, the commander says “Failure is inevitable.” What do you think he means?

C. What did the cadets discover by the end of the video?

Aurora Station Worksheet Standards Alignment by Section

Student Worksheet – Engage

Explicitly Addressed

- SC.7.N.1.1
- SC.6.N.1.5
- SC.8.E.5.10
- CS.912.CS.3.3

Student Worksheet – Explore

Explicitly Addressed

- SC.7.P.11.2
- SC.7.P.10.3
- SC.8.E.5.3
- SC.6.N.1.4

Implicitly Reinforced

- SC.8.N.1.6
- SC.912.E.5.4

Student Worksheet – Explain

Explicitly Addressed

- SC.7.N.1.1
- SC.912.N.1.1
- SC.912.N.1.3

Implicitly Reinforced

- SC.912.N.4.1

Student Worksheet – Elaborate

Explicitly Addressed

- SC.7.P.10.3
- SC.7.P.11.2
- CS.912.CS.2.5

Implicitly Reinforced

- SC.912.P.10.13

Student Worksheet – Evaluate

Explicitly Addressed

- SC.6.N.1.5
- SC.912.N.4.1

Implicitly Reinforced

- SC.912.N.1.3

Teacher Answer Key — Student Worksheet (Timestamp Aligned)

1. Engage — Opening Scene (00:00:09–00:04:16)

A. Scientific systems students may list:

- Sensors
- Communication systems
- Power systems
- AI (Argus)
- Starship navigation

B. Purpose of sensors: Detect objects, measure energy, gather environmental data.

C. Communication technology: Long-range subspace communication or futuristic radio transmission.

2. Explore — Identifying Science Concepts (00:04:16–00:07:14)

A. First assignment: Calibrate the station’s long-range sensor array.

B. Types of interference:

- Planetary troposphere
- Planetary ionosphere
- Asteroid belt interference
- Subspace energy fluctuations

C. Challenges in calibration: Too much data, signal interference, incorrect gain settings, team coordination issues.

3. Explain — Science Practices in Action (00:07:14–00:09:27)

A. Science skill: Prediction.

B. Teamwork example: Dividing tasks—analyzing surge damage, determining power priorities, restoring systems.

C. Nature of Science: Unexpected results, trial and error, collaboration, using evidence to solve problems.

4. Elaborate — System Diagram (00:09:27–00:12:23)

Acceptable explanations include (Rubric below):

- **Sensor grid:** Detects anomalies; requires calibration; sensitive to interference.
- **EPS conduit:** Transfers plasma energy; overloads can cause failures.
- **ODN relays:** Carry data signals; damage disrupts system communication.
- **Bypass module:** Reroutes power around damaged components.

5. Evaluate — Reflection (00:12:23–00:15:15)

A. Scientific work insight: Problems happen; solving them is part of the process.

B. Meaning of “Failure is inevitable”: Failure is normal; what matters is learning and adapting.

C. Final discovery: A mysterious old Earth DY-100 class vessel at long-range sensor limits.

Reflection Rubric

Criteria	4 - Exceeds	3 - Meets	2 - Developing	1 - Beginning
Understanding	Clear and accurate	Correct	Partial	Incorrect
Evidence	Strong examples	Some examples	Limited	None
Depth	Insightful reasoning	Logical	Basic	Minimal
Clarity	Clear and organized	Mostly clear	Some confusion	Unclear

System Diagram Rubric

Criteria	4 - Exceeds	3 - Meets	2 - Developing	1 - Beginning
Accuracy	Complete and accurate components	Mostly accurate	Some inaccuracies	Incomplete/incorrect
Labeling	All clearly labeled	Most labeled	Some missing	Few/no labels
Explanation	Clear and correct explanation	Mostly correct	Partial understanding	Unclear/incorrect
Connection to Story	Strong connection	Some connection	Weak connection	No connection

GLOSSARY

AI (Artificial Intelligence) - A computer system that can learn, make decisions, or solve problems.

Anomaly - Something unusual or unexpected that doesn't fit the normal pattern.

Asteroid Belt - A region in our Solar System filled with many rocky objects called asteroids. These rocks come in different sizes and shapes and are leftover pieces from when the planets first formed.

BPM (Bypass Power Module) - A device that keeps electricity flowing to important equipment by providing a backup path when part of the system needs repair.

Bypass- An alternate path that lets electricity or signals go around a broken part.

Calibration - Adjusting a tool or device so it gives accurate measurements.

Circuit- A closed path that electricity flows through.

Conduit -A tube or channel that carries wires, energy, or signals.

Data Logs - Records that show what a system has done over time, like a digital diary of events.

Diagnostics - Tests used to find out what is wrong with a system or machine.

Energy Transfer- How energy moves from one place to another.

Firewall - A digital security barrier that protects computers and networks from unauthorized access.

Interference- Anything that blocks, weakens, or changes a signal.

Ionosphere – The upper layer of a planet's atmosphere above the clouds. It contains charged particles that react to sunlight and help radio waves travel long distances.

Light-Year - The distance light travels in one year, used to measure very large distances in space.

Morse Code - A communication system that uses short and long signals dots (·) and dashes (-) to send messages using sound, light, or flashes.

ODN (Optical Distribution Network) - A system that carries information using light through fiber-optic cables. It connects the main internet source to homes and buildings.

Relay-A switch that opens or closes automatically to control electricity.

Sensor - A device that detects something in the environment like light, heat, motion, or pressure—and turns it into an electrical signal.

Sensor Grid - A group of sensors working together across an area to collect information in real time.

System Failure - When part of a machine or system stops working the way it should.

Trajectory- The path an object follows as it moves through space.

Troposphere - The lowest layer of a planet's atmosphere where almost all weather happens.

GLOSSARY OF FICTIONAL STAR TREK TERMS

EPS or Electro-Plasma System is the fictional primary form of energy distribution on starships or space stations. It is responsible for distributing power throughout the ship or station, ensuring that various systems and components receive the necessary energy to function. The EPS is crucial for the operation of systems, including propulsion and weaponry.

EPS conduit or Electro-Plasma Conduit (below) are crucial components in the energy distribution systems of spaceships in the fictional Star Trek universe. They are designed to transport energy from the warp system (core) or impulse engine throughout the ship.

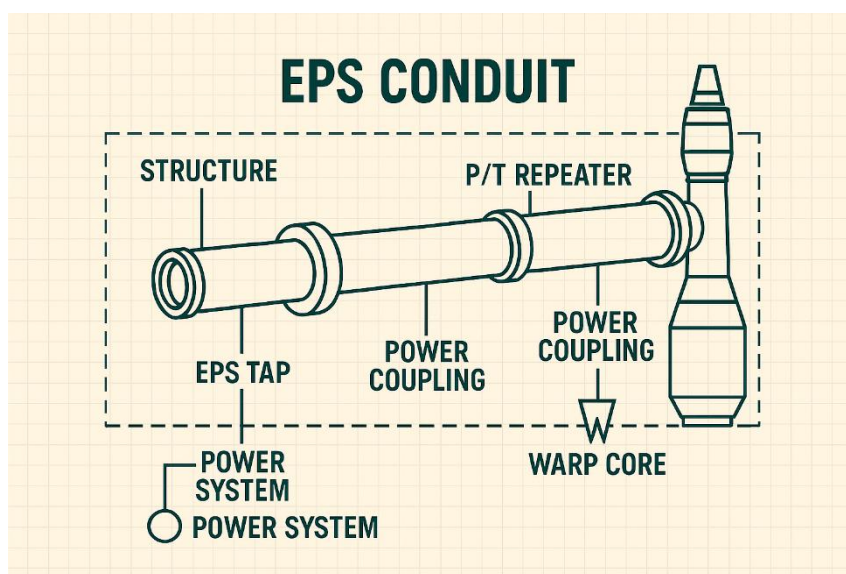
EPS tap was a device connected to the EPS network aboard a starship or space station. It enabled personnel to drain energy from the EPS to power other devices or systems.

Plasma serves as a primary energy medium in fictional starships in Star Trek. Plasma is also utilized in various forms of energy distribution, including warp drive systems, where it generates energy that propels spaceships through space.

Plasma compensator is a device that helps stabilize the plasma energy flow, so it stays consistent.

Subspace is a fictional type of space that allows signals or ships to travel faster than normal space would allow, commonly used in Star Trek to allow vehicles to travel faster than light (FTL). It's like a special shortcut layer of space used in science-fiction for communication and travel.

Subspace energy fluctuations refer to the fictional energy variations that occur within subspace which must be navigated around by ships when they travel through it.



Hands-On Troubleshooting Challenge: "Fix the Broken Circuit!"

This activity gives students realistic engineering experience by asking them to diagnose and repair intentionally broken circuits. It mirrors the troubleshooting scenes in *Aurora Station* and reinforces teamwork, observation, and problem-solving. This activity is designed to align with middle school STEM standards while reinforcing real engineering habits.

Objective - Students will identify, test, and repair faults in a simple electrical circuit using diagnostic reasoning and safe engineering practices.

Learning Goals: Students will:

- Apply diagnostic reasoning
- Practice safe testing procedures
- Understand open vs. closed circuits
- Strengthen teamwork and communication
- Connect hands-on troubleshooting to engineering scenes in *Aurora Station*

Materials Needed

- Breadboard
- LED (any color)
- Resistor (100–330 Ω)
- Jumper wires
- Battery pack (2 AA or 9V with adapter)
- Multimeter (optional but recommended)
- Teacher-prepared "broken" circuit

Teacher Setup: Create Intentionally Broken Circuits - Prepare circuits with **one hidden fault**. Each group receives a different version.

Possible Faults:

- LED installed backwards
- Resistor placed in the wrong row
- Missing jumper wire
- Wire inserted into the wrong rail
- Battery pack reversed
- Broken wire (looks normal but doesn't conduct)
- LED leg bent so it doesn't make contact
- Resistor replaced with a wire (safe only with low-voltage battery)
- Open circuit: one wire intentionally left out

Optional Extensions

- Time-trial repair challenge
- Create-your-own broken circuit for another group
- Add a second LED or switch to increase complexity

Troubleshooting Activity Rubric

Criteria	4 - Exceeds	3 - Meets	2 - Developing	1 - Beginning
Problem Identification	Accurate with evidence	Correct	Partial	Incorrect
Process	Follows full process	Mostly follows	Partial	Does not follow
Tools & Safety	Consistently safe/correct	Minor errors	Multiple errors	Unsafe
Teamwork	Actively collaborates	Works well	Inconsistent	Minimal
Solution	Fully successful	Successful	Partial	Not fixed

Name: _____ period: _____ date: _____

Student Procedure

1. Inspect the Circuit (No Power)

- Do not turn on the battery yet.
- Look closely at the breadboard layout.
- Identify anything that looks loose, misplaced, or unusual.
- Record observations.

Notes:

2. Visual Check for Common Issues

- Is the LED facing the correct direction?
- Are wires fully inserted?
- Are components in the same row when they should not be?
- Are power rails connected correctly?

Notes:

3. Power Test

- Turn on the battery pack.
- Observe what happens:
 - LED lights up
 - LED flickers
 - LED stays off
 - Component overheats (turn off immediately)
- Turn power **off** after observing.

Notes:

4. Diagnostic Testing

Use tools and reasoning to find the fault.

- Use a multimeter to check voltage at the rails.
- Test continuity of wires.
- Compare the circuit to a correct reference diagram.
- Identify where the electrical path is broken.

Notes:

5. Identify the Fault (Students answer)

- What part of the circuit was not working?
- What evidence supports your conclusion?
- How would this fault affect the flow of electricity?

6. Repair the Circuit

- Reseat loose wires.
- Flip the LED if polarity was reversed.
- Move wires to correct rows.
- Replace broken wires.
- Re-test the circuit.

7. Reflection (Students write a short explanation)

- What was the original problem?
- How did you find it?
- How did your team communicate during the process?
- How does this relate to the sensor-grid failure in *Aurora Station*?

Aurora Station Exit Ticket

Name: _____ Date: _____ Period: _____

Part 1: Science & Engineering

1. What caused the sensor system failure?

- Too much data in the sensors
- A power surge from increasing energy too much
- The AI shutting down the system
- A broken communication signal

2. Which step BEST describes how the cadets fixed the problem?

- Ignored the issue and moved on
- Replaced the entire system
- Diagnosed the damage and rerouted power
- Shut off the station power completely

Part 2: Teamwork & Problem Solving

3. One way the cadet's showed teamwork was:

4. What is ONE mistake the cadets made, and what did they learn from it?

Part 3: Reflection

5. What does 'Failure is inevitable' mean in science or real life?

Part 4: Ethics & Decision Making

6. Do you think sending data without permission was right or wrong?

Right Wrong

Explain:

Bonus: What role would you play on Aurora Station and why?

Exit Ticket - Teacher Answer Key

1. Correct Answer: A power surge from increasing energy too much

2. Correct Answer: Diagnosed the damage and rerouted power

3. Sample Answers:

- Dividing tasks (analysis, repair, leadership)
- Communicating during crisis
- Supporting each other during conduit repair

4. Sample Answers:

- Mistake: Ignoring warnings / rushing decisions
- Learning: Importance of teamwork, following procedures, and safety

5. Sample Answers:

- Failure is part of learning
- Mistakes help improve skills
- Scientists learn through trial and error

6. Sample Answers: (Accept any well-justified reasoning)

RIGHT: Helped ensure discovery was used

WRONG: Broke rules, violated security and chain of command

Bonus: Any reasonable role with clear explanation

Exit Ticket Rubric

Criteria	4 - Exceeds	3 - Meets	2 - Developing	1 - Beginning
Understanding	Clear and accurate	Correct	Partial	Incorrect
Evidence	Strong examples	Some examples	Limited	None
Depth	Insightful reasoning	Logical	Basic	Minimal
Clarity	Clear and organized	Mostly clear	Some confusion	Unclear

NGSS Compliance Summary

This addendum provides a one-page summary documenting alignment with the Next Generation Science Standards (NGSS). It identifies specific NGSS components and numerically maps their application across the Lesson Plan, Discussion Questions, and Student Worksheet components of the Aurora Station instructional materials.

1. NGSS Standards Addressed

- **Middle School**
 - **MS-ETS1-1** – Define the criteria and constraints of a design problem.
 - **MS-ETS1-2** – Evaluate competing design solutions using evidence.
 - **MS-PS3-5** – Construct explanations for energy transfer and system performance.
 - **MS-ESS1-2** – Develop models to describe objects and signals in space.
- **High School**
 - **HS-ETS1-2** – Design solutions to complex real-world problems by breaking them into manageable parts.
 - **HS-PS3-1** – Create computational or conceptual models to calculate or explain energy flow.
 - **HS-ESS1-1** – Analyze data to determine scale properties of objects in the

2. Science & Engineering Practices Applied

- Asking Questions & Defining Problems – Identify cause of sensor failure.
- Analyzing & Interpreting Data – Interpret sensor readings and probabilities.
- Constructing Explanations – Explain failures using evidence.
- Developing Models – Diagram system components and interactions.
- Engaging in Argument from Evidence – Justify repair and ethical decisions.

3. Application by Instructional Section

- **Lesson Plan**
 - Engage: Observation and questioning of system behavior.
 - Explore: Identification of system interactions.
 - Elaborate: Engineering model creation.
- **Discussion Questions**
 - Evidence-based explanations of failures.
 - Ethical reasoning regarding technology use.
- **Student Worksheet**
 - Data identification and explanation.
 - System modeling and reflection.