



### Lesson Synopsis:

Students will research and describe the history of space exploration and make predictions about the future of space exploration. They will construct a timeline of space exploration events and scientists.

### TEKS:

**6.11** *Earth and space. The student understands the organization of our solar system and the relationships among the various bodies that comprise it. The student is expected to:*

**6.11C** Describe the history and future of space exploration, including the types of equipment and transportation needed for space travel.

### Scientific Process TEKS:

**6.3** *Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to:*

**6.3D** Relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.

**6.4** *Scientific investigation and reasoning. The student knows how to use a variety of tools and safety equipment to conduct science inquiry. The student is expected to:*

**6.4A** Use appropriate tools to collect, record, and analyze information, including journals/notebooks, beakers, Petri dishes, meter sticks, graduated cylinders, hot plates, test tubes, triple beam balances, microscopes, thermometers, calculators, computers, timing devices, and other equipment as needed to teach the curriculum.

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## GETTING READY FOR INSTRUCTION

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### Performance Indicator(s):

- Construct a timeline showing significant events and related scientists in the history of space travel. On the timeline, include major types of equipment and transportation used during the events. Write a projection of what might occur in space exploration during the next 25 years. (6.3D; 6.11C) 1C

### Key Understandings and Guiding Questions:

- Space exploration has progressed through the years.
  - How has space been explored in the past?
  - How do you think space may be explored in the future?

### Vocabulary of Instruction:

- space
- space shuttle
- space station
- space probe
- rocket
- satellite

## Materials:

Refer to Notes for Teacher section for materials.

## Attachments:

- Teacher Resource: **The Way to Space** (1 for projection)
- Teacher Resource: **Where Does Space Begin?** (1 for projection)
- Handout: **Space Vehicle Data Sheet** ( 1 per student)
- Teacher Resource: **Space Vehicle Data Sheet KEY**
- Handout: **Space Exploration Cards PI** (1 set per group)
- Teacher Resource: **Space Exploration Cards KEY**
- Handout: **Space Exploration Scientists Cards PI** (see Advance Preparation, 1/4 of sheet per group)
- Teacher Resource: **Space Exploration Scientists Cards KEY**
- Teacher Resource: **Performance Indicator Instructions KEY** (1 for projection)

## Advance Preparation:

1. Arrange for student computer/Internet use for Days 1–3.
2. Prepare a designated location for **Space Vehicle Data** charts to be posted.
3. Prior to Day 2, print the Handout: **Space Exploration Scientists Cards** (1/4 of sheet per group), and cut it apart.
4. Prepare a designated location for timelines to be posted.
5. Prepare attachment(s) as necessary.

## Background Information:

In this lesson, students study the history of space exploration and make predictions about the future of space exploration.

### STAAR Notes:

This is an important foundational piece for the understanding of gravity and its effects on our solar system. 6.11B is marked as a Supporting Standard and will be tested on STAAR Grade 8 under Reporting Category 3: Earth and Space. The information in this unit also builds content for standards 8.7A, B and C. Both Readiness Standards 8.7A and 8.7B and Supporting Standard 8.7C will be tested on STAAR Grade 8 under Reporting Category 3: Earth and Space.

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## GETTING READY FOR INSTRUCTION SUPPLEMENTAL PLANNING DOCUMENT

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Instructors are encouraged to supplement and substitute resources, materials, and activities to differentiate instruction to address the needs of learners. **The Exemplar Lessons are one approach to teaching and reaching the Performance Indicators and Specificity in the Instructional Focus Document for this unit.** Instructors are encouraged to create original lessons using the Content Creator in the Tools Tab located at the top of the page. All originally authored lessons can be saved in the "My CSCOPE" Tab within the "My Content" area.

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## INSTRUCTIONAL PROCEDURES

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### Instructional Procedures

#### ENGAGE – The Way to Space

1. Project the Teacher Resource: **The Way to Space**.  
Ask:

### Notes for Teacher

**NOTE:** 1 Day = 50 minutes

#### Suggested Day 1

#### Attachments:

- Teacher Resource: **The Way to**

## INSTRUCTIONAL PROCEDURES

- **What could these four objects have in common?** (*They are types of vehicles used for space travel and exploration.*)
  - **What are the names of these objects?** (*From left to right: space station, space probe; bottom row: space shuttle, rocket*)
  - **Just by looking at the image, which of these vehicles could allow humans to survive in space?** (*Space station and space shuttle*)
2. Ask:
- **How far above the Earth do you have to go to be in space?** *Answers will vary.* Write all responses on the board.
3. Project the Teacher Resource: **Where Does Space Begin?** Inform students that the accepted distance for international purposes is about 100 km (about 62 miles) above sea level. This imaginary line is called the Kármán line.

## EXPLORE/ EXPLAIN – Space Vehicles

1. Number students 1–4. Assign each student a type of space exploration vehicle to research. (1. Space Station; 2. Space Shuttle; 3. Space Probe; 4. Rocket)
2. Distribute the Handout: **Space Vehicle Data Sheet** to each student. Refer to the Teacher Resource: **Space Vehicle Data Sheet KEY** to assist students with research.
3. Instruct students to work in pairs to describe the history of their assigned vehicle, equipment it can carry, if it can carry humans, and how it aids in space exploration.
4. Monitor and assist as necessary.
5. Once student pairs have completed their own Handout: **Space Vehicle Data Sheet**, instruct all of the 1s (and 2s, 3s, and 4s) to collaborate to record their information on a large sheet of chart paper.
6. Instruct students to post their Space Vehicle Data Chart at the designated location (see Advance Preparation).
7. Re-group students so that each group consists of a 1, 2, 3, and 4. (*Groups may have duplicates depending on class size.*)
8. Instruct students to conduct a Gallery Walk to complete the remainder of their **Space Vehicle Data Sheets**. At chart #1, student #1 presents; at chart #2, student #2 presents, and so forth and so on. Explain to students that they may only rotate on your signal.
9. At the completion of the Gallery Walk, instruct students to affix the **Space Vehicle Data Sheet** to their notebooks.
10. Facilitate a class discussion using the following questions:

## Suggested Days 1 (continued) and 2

### Materials:

- paper (chart or butcher, 1 sheet per group)
- markers (per group)
- tape or glue (per group)

### Attachments:

- Handout: **Space Vehicle Data Sheet** (1 per student)
- Teacher Resource: **Space Vehicle Data Sheet KEY**

### Instructional Notes:

A key is not provided as students will pull information they think fits. All information may not be found on one site. You may find it helpful to search the NASA site for types of space craft.

### Check for Understanding:

This information is a concise version of some of the information students gathered.

### Science Notebooks:

Students affix the **Space Vehicle Data Sheet** to their notebooks.

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## INSTRUCTIONAL PROCEDURES

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Ask/Say:

- **What is a space shuttle?** *Space shuttles are reusable space crafts that are used to take manned missions to space.*
- **What is a probe?** *Probes are vehicles that carry sophisticated instrumentation, but no crew. They are designed to explore various aspects of the solar system.*
- **What is a rocket?** *Rockets are used mainly for delivering **satellites** into space; however, they have been known to launch manned space crafts into orbit.*
- **What is a satellite?** *A satellite is an object that orbits a planet. The Moon is a natural satellite. There are manmade satellites that collect data, aid in communication, and used by the military.*
- **What is a space station?** *The International Space Station is a **satellite** that serves as a home for the crew while they perform scientific research and experiments.*
- **Many astronauts conducted scientific experiments during their time in space.**
- **Any space exploration will aid in expanding our knowledge of the solar system and possibly the universe.**

11. Instruct students to affix their handouts to their notebooks.

### ELABORATE/EVALUATE – Performance Indicator

#### Performance Indicator

- Construct a timeline showing significant events and related scientists in the history of space travel. On the timeline, include major types of equipment and transportation used during the events. Write a projection of what might occur in space exploration during the next 25 years. (6.3D; 6.11C) 1C

1. Refer to the Teacher Resource: **Performance Indicator Instructions KEY** for information on administering the assessment.

### Suggested Days 2 (continued) and 3

#### Materials:

- adding machine tape (varies per group)
- tape or glue (per group)
- scissors (1 per student)
- paper (notebook, 1 sheet per student)

#### Attachments:

- Handout: **Space Exploration Cards PI** (1 set per group)
- Teacher Resource: **Space Exploration Cards KEY**
- Handout: **Space Exploration Scientists Cards PI** (see Advance Preparation, 1/4 of sheet per group)
- Teacher Resource: **Space Exploration Scientists Cards KEY**
- Teacher Resource: **Performance Indicator Instructions KEY** (1 for projection)