

Domain-Based Unit Overview

Title of Domain: Astronomy: Space Systems

Big Idea

Students are introduced to the concept of a vast universe with many parts, including solar systems and galaxies, and many objects, including stars, planets, dwarf planets, asteroids, meteors, comets, and dust.

What Students Need to Learn

- *Introduction to Astronomy*
- *Evidence of Earth's Movement*
- *Stars*
- *Gravity*

MN Academic Standards (2019)

5E.2.2.1.2

5E.4.1.1.1

Pre-Assessment

- 1) What is the solar system?
- 2) How does Earth move in space?
- 3) Why do some stars appear brighter than others?

Domain Chapter 1	The Solar System (1 Day)
MN Academic Standards	<i>5E.2.2.1.2</i>
Objectives	<p>✓ <i>List the planets in our solar system in order of increasing distance from the sun.</i></p> <p>✓ <i>Identify and describe at least three different types of objects that can be found in our solar system.</i></p>
Vocabulary	solar system, and orbit
Procedure	<ol style="list-style-type: none"> 1. Teacher: What is the solar system? (write all answers on the large white board) 2. Introduce chapter vocabulary and the big question “What is the solar system?” 3. Large group read chapter 1

	<p>4. Hold a class discussion on the following comprehension questions.</p> <ol style="list-style-type: none"> What are some components of a solar system? What sets Earth, the planet we are on, apart from the others they know about. How does each planet’s distance from the sun affect its revolution around the sun? How is Earth’s moon sets it apart from the other planets Are there other solar systems? How are dwarf planets different from planets? <p>5. Exit Ticket: Have students answer the big question “What is the solar system?” with their table groups.</p>
Poetry	<i>If Applicable</i>
Fiction	<i>If Applicable</i>
Saying and Phrases	<i>If Applicable</i>
Writing	<i>If Applicable</i>

Domain Chapter 2	The Vastness of Space (3 Day)
MN Academic Standards	5E.2.2.1.2
Objectives	<p>✓ Distinguish between the terms universe, galaxy, and solar system.</p> <p>✓ Identify our solar system as part of the Milky Way galaxy.</p>
Vocabulary	galaxy, and universe
Procedure	<p>Day 1</p> <ol style="list-style-type: none"> Review: “What is the solar system?” Today we will be investigating the vastness of space. Lead a discussion with students about space. Note that students have already learned much about space, including what solar systems, stars, planets, moons, and other objects are. <ol style="list-style-type: none"> Ask students to name something else in space that they have not learned about so far in this unit. How do we know about what is in space? Call on volunteers to name any technology they know about that helps us understand space better. Ask each student to write down one question he or she has about space. Then have students check for an answer to their questions as they read. Teacher reads chapter 2 asking comprehension questions throughout reading. Return to students one question about space. Have them answer the question and share with classmates. As a class complete activity 3.1 (teacher guide page 124)

	6. Exit Ticket: Ask each student the following question: What is the universe, and what are galaxies?
Poetry	<i>If Applicable</i>
Fiction	<i>If Applicable</i>
Saying and Phrases	<i>If Applicable</i>
Writing	<i>If Applicable</i>

Domain Chapter 3	Earth's Movement (2 Day2)
MN Academic Standards	5E.2.2.1.2
Objectives	<p>✓ Describe and model the movement of Earth in space.</p> <p>✓ Distinguish between Earth's rotation and its orbit.</p> <p>✓ Use a model to identify patterns of night and day on Earth.</p>
Vocabulary	axis
Procedure	<p>Day 1</p> <ol style="list-style-type: none"> 1) Review: What is the universe, and what are galaxies? 2) Teacher: Introduce the next section which will focus on Earth's movement. 3) Introduce chapter three vocabulary and the big question: "How can I model the ways that Earth moves in space?" 4) Distribute handout 4.1 and follow teacher prompts in lesson 4 of teacher book (4.1:Teacher's guide pages 125-126) <p>Day 2</p> <ol style="list-style-type: none"> 1) Review: How does Earth move? 2) Teacher: We will continue learning how Earth moves in space today. 3) Introduce chapter three vocabulary and the big question: How does Earth move in space? 4) Small groups read chapter 3 and have students answer the following comprehension questions.. <ol style="list-style-type: none"> a) Why don't we feel Earth moving? b) What causes shadows to change? c) Describe the evidence that supports that Earth revolves around the sun d) Why is Earth's axis tilted, and what are the effects of the tilt? e) How have theories about Earth's place in space changed over time? 5) Homework (Activity 5.1, pg. 127) 6) Exit Ticket: Have students answer the following questions on a notecard.

	<ul style="list-style-type: none"> a) What is the difference between rotation and revolution? b) What revolves around the Earth? c) What revolves around the sun? d) What is an orbit? e) How does Earth move in space?
Poetry	<i>If Applicable</i>
Fiction	<i>If Applicable</i>
Saying and Phrases	<i>If Applicable</i>
Writing	<i>If Applicable</i>

Domain Chapter 4	The Moon from Earth (1 Day)
MN Academic Standards	5E.4.1.1.1 5E.2.2.1.2
Objectives	<ul style="list-style-type: none"> ✓ Describe and model the movement of the moon. ✓ Describe what causes moon phases and predict the appearance of the moon.
Vocabulary	moon phase, solar eclipse, and lunar eclipse
Procedure	<ul style="list-style-type: none"> 1. Review: How does Earth move in space? 2. Class brainstorm on the following questions: <ul style="list-style-type: none"> a. How does the moon look each day or night? b. What causes the moon to shine? c. Is there ever a time when you cannot see the moon at all? d. Describe how the moon moves. 3. Video on moon phases: https://www.youtube.com/watch?v=f4ZHdzl6ZWg 4. Homework: Activity 6.1 found in teachers guide on page 128. 5. Exit Ticket: What are the moon phases and eclipses?
Poetry	<i>If Applicable</i>
Fiction	<i>If Applicable</i>
Saying and Phrases	<i>If Applicable</i>
Writing	<i>If Applicable</i>

Domain Chapter 5	Brightness of Stars (3 Days)
MN Academic Standards	5E.4.1.1.1 5E.2.2.1.2
Objectives	<ul style="list-style-type: none"> ✓ Provide evidence to support explanations of Earth's movement. ✓ Describe observable patterns in the movement of stars in the night sky.
Vocabulary	star, apparent brightness, absolute brightness, and light-year
Procedure	Day 1

	<ol style="list-style-type: none"> 1) Introduce chapter vocabulary and the big idea: How do star patterns provide evidence of Earth’s movement? 2) As a class brainstorm the following questions: <ol style="list-style-type: none"> a) How do star patterns provide evidence of Earth’s movement? b) What happens when you take a photo of something moving? c) A long exposure photo of the stars is taken much more slowly than common photos. It can take an hour to take the photo, or even all night. 3) Display a long exposure photo of a star and ask the following questions: <ol style="list-style-type: none"> a) What is making the streaks of light across the sky? b) What causes the streaks of light? c) What are the streaks evidence of? 4) Handout worksheet 8.1 from the teacher guide (pages 130-131) and follow the teacher guide on activity directions. 5) Exit Ticket: How do star patterns provide evidence of Earth’s movement? <p>Day 2</p> <ol style="list-style-type: none"> 1) Review chapter five vocabulary from yesterday and the Big Idea: Why do some stars appear brighter than others? 2) Complete activity “Star Light, Star Bright” (Teacher’s guide 10.1, page 132) in small table groups. 3) Read chapter 5 as a class and answer the comprehension questions found in the teacher book (lesson 9) <p>Day 3</p> <ol style="list-style-type: none"> 1) Review: Why do some stars appear brighter than others? 2) Introduce learning targets for lesson, core vocabulary, and the big idea: Why do some stars appear brighter than others? 3) Read chapter five as a large class and answer comprehension questions found within lesson 10 of the teacher’s guide. 4) Complete activity 10.1 (teacher’s guide page 133) as a class.
Poetry	<i>If Applicable</i>
Fiction	<i>If Applicable</i>
Saying and Phrases	<i>If Applicable</i>
Writing	<i>If Applicable</i>

Domain Chapter 6	Constellations (2 Days)
MN Academic Standards	5E.4.1.1.1 5E.2.2.1.2

Objectives	<ul style="list-style-type: none"> ✓ Describe patterns in the stars. ✓ Predict the movement of constellations over time. ✓ Explain why some constellations change over time, while some do not.
Vocabulary	constellation
Procedure	<p>Day 1</p> <ol style="list-style-type: none"> 1) Review: Why do some stars appear brighter than others? 2) Introduce learning targets for lesson, core vocabulary, and the big idea: What are constellations? 3) Read chapter six as a large class and answer comprehension questions found within lesson 11 of the teacher's guide. 4) Complete activity 11.1 (teacher's guide pages 134-136) as a class. <p>Day 2</p> <ol style="list-style-type: none"> 1) Today we will take a look at the constellations. 2) Students will create constellations out of mini marshmallows. 3) Students should work with their table partners to complete activity 12.1 (teacher's guide pages 137-138)
Poetry	<i>If Applicable</i>
Fiction	<i>If Applicable</i>
Saying and Phrases	<i>If Applicable</i>
Writing	<i>If Applicable</i>

Domain Chapter 7	Gravity (2 Days)
MN Academic Standards	5E.4.1.1.1 5E.2.2.1.2
Objectives	<ul style="list-style-type: none"> ✓ Describe the shape of Earth. ✓ Identify the direction of Earth's gravity at two or more locations on Earth's surface. ✓ Explain the relationship between the moon's gravity and tides on Earth. ✓ Explain the relationship between the sun's gravity and the orbits of the planets around the sun.
Vocabulary	gravity
Procedure	<p>Day 1</p> <ol style="list-style-type: none"> 1) Review: What are constellations? 2) Teacher: Today we will be learning about gravity. We will begin by completing a K-W-L chart. 3) Review chapter seven vocabulary and the Big Question: What is gravity?

	<p>4) Large group read chapter 7 and answer the discussion comprehension questions found in lesson 13 of the teacher’s guide.</p> <p>5) Class Activity: Activity 13.1 (Teacher guide page 139)</p> <p>6) Homework: Activity 13.2 (Teacher guide page 140)</p> <p>7) Exit Ticket: What is gravity?</p>
Poetry	<i>If Applicable</i>
Fiction	<i>If Applicable</i>
Saying and Phrases	<i>If Applicable</i>
Writing	<i>If Applicable</i>

Domain Chapter 7	Women and Studying Space (3 Days)
MN Academic Standards	5E.4.1.1.1 5E.2.2.1.2
Objectives	✓ Fluently discuss the unit’s astronomy-related topics.
Vocabulary	
Procedure	<p>Day 1</p> <p>1) Review: What is gravity?</p> <p>2) Teacher: Today we will learn about women who studied space.</p> <p>3) Have students read chapter eight with a partner.</p> <p>4) Students will independently work on “Activity Page U.R. 1” on teacher’s guide page 144.</p> <p>5) Homework: ActivityPage U.R. 2 (Teacher’s guide page 145)</p> <p>6) Exit Ticket: How have people learned about space systems?</p> <p>Day 2</p> <p>1) Students will play “Oh No” to help prepare them for tomorrow’s assessment.</p> <p>Day 3</p> <p>1) Students will complete the end of unit assessment (Teacher’s guide pages 146-151)</p>
Poetry	<i>If Applicable</i>
Fiction	<i>If Applicable</i>
Saying and Phrases	<i>If Applicable</i>
Writing	<i>If Applicable</i>