

Unit 2: Earth and the Universe

6th Grade Science

14 Class Meetings

Revised May 2024

Essential Questions

- How are we connected to the patterns we see in the sky and space?
- How does Earth's movement in space impact the natural world?

Enduring Understandings with Unit Goals

EU 1: The sun and moon interact with Earth, causing an impact to multiple Earth systems.

- Examine how the moon's force plays a role in Earth's water movement.
- Describe the cyclic pattern of lunar phases, eclipses of the sun and moon, and seasons.
- Compare roles of natural and man-made satellites

EU 2: The Earth's movement and positioning in our solar system and pattern of movement impact our planet.

- Analyze the tilt of the Earth and its impact on earth's environment and weather.
- Examine the role gravity plays on Earth and our solar system.

Standards

Next Generation Science Standards:

- **MS-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.
- **MS-ESS1-2:** Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
- **MS-ESS1-3:** Analyze and interpret data to determine scale properties of objects in the solar system.

Common Core State Standards:

- **RI 6.1:** Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- **RI 6.3:** Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text.
- **RI 6.8:** Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.
- **W 6.1:** Write arguments to support claims with clear reasons and relevant evidence
- **W 6.2:** Write informative/explanatory texts to examine and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content
- **6.NS.C.5:** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
- **RST.6-8.:** Cite specific textual evidence to support analysis of science and technical texts.
- **RST.6-8.9:** Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

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ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.

Competency 2: Speak to diverse audiences in an accountable manner.

Competency 3: Develop the behaviors needed to interact and contribute with others on a team.

Competency 4: Analyze and solve problems independently and collaboratively.

Competency 5: Be responsible, creative, and empathetic members of the community.

Unit Content Overview

1. The Moon

- Outline the phases of the moon.
- Define how an eclipse takes place.
- Examine how the moon is a satellite for Earth. Examining its role and impact on Earth.

2. Earth and its many movements

- Explain why the Earth's tilt is a major reason for the seasons.
- Illustrate Earth's movement in our solar system.
- Examine how the Earth's movement changes our planet.
- Explain how the pull of the Moon and Earth's movement impacts the tides.

3. Earth's place in the solar system

- Analyze the role of gravity in our solar system and planet.
- Evaluate the sun's relationship with Earth.

Vocabulary and Key Terms: phase, crescent, gibbous, waxing, waning, tides, gravity, rotation, revolution, tilt, hemisphere, orbit, solar system, illuminates, axis, solar eclipse, lunar eclipse, diurnal tides, semi-diurnal tides, mixed tides, spring tide, neap tide, solstice, equinox

Interdisciplinary Connection:

Language Arts, Math, Humanities

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Daily Learning Objectives with TWPS

Students will be able to...

- Diagram and explain the phases of the moon***
 - *Why does the moon appear to change shape during the month?*
 - *What tools or methods can we use to track the phases of the moon?*
 - *How do other cultures interpret the phases of the moon?*
- Develop a model which acutely details the phases of the moon and their identification markers including duration of time and visual recognition.
 - *What determines the phases of the moon?*
- Create a model of the sun, Earth, and moon to show the relationship in terms of size and position.
 - *How does the Sun's energy reach Earth and what role does it play in sustaining life on our planet?*
 - *How does the Sun's position in the sky change throughout the day and throughout the year?*
- Examine how the solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them.
**
 - *What could you do to demonstrate the word gravity to someone?*
 - *What are some examples of how gravity affects everyday life?*
- Determine the parts of an eclipse.
 - *Why don't we see an eclipse every month?*
- Prepare a model of the solar system that can explain eclipses of the sun and the moon.
 - *How does a lunar eclipse differ from a solar eclipse?*
 - *What are some myths or legends about eclipses from different cultures around the world?*
- Compare and contrast man-made vs. natural satellites and the roles they play within Earth's orbit.
 - *What is a satellite and how does it differ from a natural celestial body like a planet or moon?*
 - *How do satellites contribute to our understanding of Earth's climate, atmosphere, and environment?*
- Interpret the seasons on a map based on the position of the sun.
 - *Why do some parts of the world experience different seasons while others do not?*
- Outline how the seasons are a result of the tilt Earth and are caused by the differential intensity of sunlight on different areas of Earth across the year. **
 - *How do scientists' study and track the changing seasons?*
 - *What role do the Sun's rays play in creating the seasons?*
 - *How would you explain the way the movement and positioning of the Earth and the Sun impact the seasons.*
- Draw a diagram of the Earth, sun, and moon and explain where high and low tides occurring. **
 - *What role does gravity play in creating tides?*
 - *What role does an eclipse play in impacting a tide?*

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Instructional/ ELL Strategies/Differentiated Instruction

- Power Point Lecture with notetaking
- Guided notetaking
- Warm up activities
- Flexible grouping
- Independent reading
- Lab activities
- Exit slips
- Graphic Organizers
- Creating authentic connections for students
- Vocabulary word bank
- Rephrasing and restatement of information and concepts
- Tiered instruction
- Alternative test settings
- Reading and accountable talk discussions of texts
- Student-led instruction
- Homework assignments
- Hands-on activities
- SIOP strategies- Teachers implement SIOP strategies to introduce academic vocabulary and use multiple modes of representation including gestural, oral, pictorial, graphic and textural.

Assessments

FORMATIVE ASSESSMENTS:

- Guided notes
- Homework
- Do It Now Activities
- Daily Think-Write-Pair-Share (TWPS) Activities
- Accountable Talk Discussions
- Oral questioning
- Exit slips
- Warm Up activities
- Close reading and interpretation of text
- Performance Task – Welcome to Earth
 - Literacy Rubric/Teacher’s Scoring Rubric

SUMMATIVE ASSESSMENTS:

- Quiz - EU 1
- Quiz – EU 2
- Performance Task – Welcome to Earth

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Unit Task

Unit Task Name: Welcome to Earth

Description:

Students will compose a five paragraph creative informational essay. They may choose one topic from a choice board that asks them to imagine they are visiting Earth from another planet. They may either write about the cyclical pattern of the lunar phases (EU1), how gravity impacts the tides (EU2), or how the movement and position of the Earth in relation to the Sun impacts seasons (EU2).

Evaluation: Literacy Rubric/Teacher's Scoring Rubric

Unit Resources

- Non-Fiction Text
- Internet databases
- Interactive Notebooks
- Large format poster printer
- Microsoft Power Point or Prezi
- Laptops
- NOAA website
- Lab materials