

Unit 6: Astronomy

Content Area: **Science**
Course(s): **Science 6**
Time Period: **April**
Length: **20 Days**
Status: **Published**

Unit Summary

This unit is broken down into three sub-ideas: the universe and its stars, Earth and the solar system, and the history of planet Earth. Students examine the Earth's place in relation to the solar system, the Milky Way galaxy, and the universe. There is a strong emphasis on a systems approach and using models of the solar system to explain the cyclical patterns of eclipses, tides, and seasons. There is also a strong connection to engineering through the instruments and technologies that have allowed us to explore the objects in our solar system and obtain the data that support the theories explaining the formation and evolution of the universe. Students examine geosciences data in order to understand the processes and events in Earth's history. The crosscutting concepts of patterns, scale, proportion, and quantity and systems and systems models provide a framework for understanding the disciplinary core ideas. Students are expected to demonstrate proficiency in developing and using models and analyzing and interpreting data. Students are also expected to use these practices to demonstrate understanding of the core ideas.

This unit is based on MS-ESS1-1, MS-ESS1-2, and MS-ESS1-3

Standards

SCI.6-8.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.
SCI.6-8.MS-ESS1-3	Analyze and interpret data to determine scale properties of objects in the solar system.
SCI.6-8.MS-ESS1-2	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.

Student Learning Objectives

SLO 1: Generate and analyze evidence (through simulations or long-term investigations) to explain why the Sun's apparent motion across the sky changes over the course of a year. (ESS1.B) [Clarification Statement: This SLO is based on a disciplinary core idea found in the Framework. It is included as a scaffold to the following SLO.]

SLO 2: 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. [Clarification Statement: Examples of models can be physical, graphical, or conceptual.](MS-ESS1-1)

SLO 3: Develop and use a model that shows how gravity causes smaller objects to orbit around larger objects at increasing scales, including the gravitational force of the sun causes the planets and other bodies to orbit around it holding together the solar system. (ESS1.A; ESS1.B) [Clarification Statement: This SLO is based on disciplinary core ideas found in the Framework. It is included as a scaffold to the following SLO.]

SLO 4: Analyze and interpret data to determine scale properties of objects in the solar system.[Clarification Statement: Emphasis is on the analysis of data from Earth-based instruments, space-based telescopes, and spacecraft to determine similarities and differences among solar system objects. Examples of scale properties include the sizes of an object's layers (such as crust and atmosphere), surface features (such as volcanoes), and orbital radius. Examples of data include statistical information, drawings and photographs, and models.] [Assessment Boundary: Assessment does not include recalling facts about properties of the planets and other solar system bodies.](MS-ESS1-3)

SLO 5: Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.[Clarification Statement: Emphasis for the model is on gravity as the force that holds together the solar system and Milky Way galaxy and controls orbital motions within them. Examples of models can be physical (such as the analogy of distance along a football field or computer visualizations of elliptical orbits) or conceptual (such as mathematical proportions relative to the size of familiar objects such as students' school or state).][Assessment Boundary: Assessment does not include Kepler's Laws of orbital motion or the apparent retrograde motion of the planets as viewed from Earth.](MS-ESS1-2)

Essential Questions/ Enduring Understandings

Essential Questions

1. How does the solar system display patterns and causes and effects?
2. Why do we have seasons?
3. How does knowing the cycles help us predict and prepare for seasons?

Enduring Understandings

Students will understand that the Earth-Sun-Moon system determines the patterns of lunar eclipses, lunar phases, and seasons.

Students will understand that gravity plays a role in the motion of the solar system and galaxy.

Students will understand that solar system is quite large by using a scale model.

