Unit 5 - Space Systems: Stars and the Solar System

Content Area: **Science**
Course(s):
Time Period: **Full Year**
Length: **Full Year**
Status: **Published**

Unit Overview

Within this unit, students will study the sky: Why do we see stars? Why does the moon change? How is our weather affected by our movement around the Sun? What causes day and night? Students will also study gravity and how it affects the movement of the Earth and moon. Through investigations, students will be able to understand our part in the universe.

Enduring Understandings

Gravity pulls objects down towards the Earth.
The distance of stars varies, and the Sun is our closest star. Depending on the time of year and our revolution around the sun, some stars will seem closer to Earth than others.
Shadows change depending on the rotation of Earth and time of day.
The revolution of the moon around the Earth affects the way we see the moon each day.
The change in seasons depends on the revolution of the Earth around the Sun and the tilt of the Earth on its axis.

Essential Questions

How does gravity affect objects?
How do lengths and directions of shadows or relative lengths of day and night change from day to day?
How does the appearance of some stars change in different seasons?
Why does the moon look different at different times of the month?
How do the seasons change?

Learning Objectives

Describe the gravitational force of Earth acting on an object near Earth.
Gather data to support an argument that the gravitational force exerted by Earth on objects is directed down.
Describe how the Earth, sun, and moon move in space and as a system.
Relate gravitational force to the motions of Earth, the sun, and the moon in space.
Recognize that the sun is a star that appears larger and brighter than other stars because it is the star closest to Earth.
Understand that stars range greatly in their distance from Earth.
Investigate to show that the apparent brightness of a light-emitting object varies with distance from the observer.

Use data from the investigation to support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth.
Explain that Earth rotates on its axis once every 24 hours to cause the day/night cycle.
Demonstrate that Earth rotates on its axis once every 24 hours to cause the day/night cycle.
Explain what causes the apparent motion of the sun across the sky.
Demonstrate the different positions of the sun at different times of day.
Demonstrate that the rotation of the Earth about an axis causes observable changes in patterns of shadows over time.
Collect and record information using tools, including a meter stick and a clock.
Recognize that the orbit of Earth around the sun causes observable patterns such as the sequence of seasons over time.
Represent data in a graph to reveal patterns of seasonal changes in the length of day and night.
Describe how Earth's orbit around the sun causes observable patterns in the positions of the stars at different times of the year.
Represent data in a graphical display that reveals the patterns of change in the seasonal appearance of some stars in the night sky.
Use the graphical display to describe patterns of stars.
Describe the moon's motions, including rotation, orbiting of Earth, and apparent movement across the sky.
Explain why moon phases occur.
Describe the pattern of the moon's phases.
Collect and analyze data to identify sequences and predict patterns of change in the observable appearance of the moon over time.
Collect information about the moon's phases by making detailed observations.
Explore careers related to Earth Science.

Standards: Content

Standards: Interdisciplinary

Assessment Evidence

Formative	
Summative	
Alternative & Benchmark	
Assessment Evidence Resource	

Instructional Resources

Smartboard, Computers, Websites and digital interactives/models, Multi-media presentations, Video Streaming, Brain Pop, Middle School Science, Generation Genius Digital Curriculum, Mystery Science Digital Curriculum, Amplify Digital Curriculum, Microsoft 365, Primary and Secondary Source Docs, tape, ruler, scissors, colored pencils, crayons, markers, construction paper, graph paper, Assorted lab materials.

Instructional Resource List

Curricular Mandates

Below are the curricular requirements as defined in NJ Administrative Code and Statute

	Amistad		Diversity, Equity, and Inclusion
	Holocaust		LGBT and Disabilities (Grades 6-12)
	Climate Change		Asian American & Pacific Islander

Social Emotional Learning (SEL) Competencies

NJ Social and Emotional Learning Competencies & Sub-Competencies

	Self-Awareness		Relationship Skills
X	Responsible Decision-Making	X	Social Awareness
X	Self-Management		

21st Century Skills & Themes

X	Global and Cultural Awareness	X	Technology Literacy		Planning and Budgeting
X	Creativity and Innovation		Financial Institutions		Risk Management and Insurance
X	Information and Media		Digital Citizenship		Economic and Government

	Literacy				Influences
X	Critical Thinking and Problem Solving		Credit Profile	X	Career Awareness and Planning
	Civic Financial Responsibility		Financial Psychology		