Unit 1-Sun, Moon and Stars

Content Area: **Science**
Course(s): **Science 1**
Time Period: **Marking Period 1**
Length: **MP 1**
Status: **Published**

Essential Questions

- What is the pattern of the sun's movement?
- Does the Moon create its own light?
- What causes the seasons?
- What are the patterns of the moon?
- Where do the stars go during the day?

Big Ideas

- Patterns of movement of the sun, moon, and stars as seen from earth can be observed and predicted.

Cross-Curricuar Integration

Integration Area: Mathematics

1.DL.1.A.1 1. Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another

1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted.

Activity:

Students will complete a graph of their favorite seasons

CSDT Technology Integration

8.1.2.IC.1: Compare how individuals live and work before and after the implementation of new computing

technology

Activity: Students will watch the first moon landing video.

Climate Change

Social Studies: Cross-Curricular
6.1.2.Geo.HE.1: Explain how seasonal weather changes, climate, and other environmental characteristics affect people's lives in a place or region.
6.1.2.Geo.HE.2: Describe how human activities affect the culture and environmental characteristics of places or regions (e.g., transportation, housing, dietary needs).
6.1.2.Geo.HE3: Identify cultural and environmental characteristics of different regions in New Jersey and the United States.
6.1.2.Geo.HE.4: Investigate the relationship between the physical environment of a place and the economic activities found there.

- Activity: In this unit, students will learn about why the sun sets later in the summer time. The students will listen to the Mystery Science guided story and then they will complete the interactive worksheet.

Science and Engineering

Planning and Carrying out Investigations

- Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.

Analyzing and Interpreting Data

- Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.

Science and Society

Dr. Shamim Rahman

NASA’s Chief Engineer for the Propulsion Test Directorate at Stennis Space Center.

Felix Alberto Soto Toro

NASA design engineer for hardware and software automated systems who reviews, designs, builds, tests and implements engineering designs used in the Space Shuttle and Payload Operations Development Laboratories.

STEM/STEAM

PROBLEM-BASED LEARNING: (Day Patterns Unit) - Students develop a model of the sun's daily path across the sky, then use this model to help someone who's lost. Students create a mobile paper model of the sun and earth to illustrate the position of the sun throughout the day.

PROMOTING EMPATHY: Students develop a model of the sun's daily path across the sky, then use this model to help someone who's lost.

SUPPORT EDI: Students discuss how the moon is in the same phase no matter where you are in the world. Students also discuss how the sun always rises and sets in the same direction every day all over the world. Mystery science discusses

INTERDISCIPLINARY PROJECT:

In this unit, students make observations of the Sun and shadows throughout the day and across the seasons. They use their observations to understand patterns that occur throughout the day.
Students will also explore the Moon and stars. They observe and record the appearance of the Moon to determine its cyclical pattern. They also determine why stars are only visible at night. Students will apply what they learned over the course of this unit to predict when the Sun, Moon, and stars will be visible in the sky. Students will be able to move the source of light to create different shadows given to them. They will then determine where the sun needs to be in the sky to create certain types of shadows ie: longer, shorter, left, right, etc. Students relate these observations to shadows changing throughout the day and the Sun's position moving across the sky. Students will trace their shadows in the morning and watch how they change throughout the day. Students will gather observations of the Sun from that single location. They will see that the Sun follows a repeating pattern in its apparent motion, and then use that pattern to predict the location of the Sun at various times of day in the future. Afterwards, they will use what they learned about the sun's movement during different times of the day to develop a model of the sun's daily path across the sky, then use this model to help someone who's lost. Students create a mobile paper model of the sun and earth to illustrate the position of the sun throughout the day.

They will determine where the sun is at certain times of the day in order to have them follow the sun to get to their destination.

students explore all of the different shapes of the Moon that can appear on different nights.Students will keep track of the moon each night for an entire month. They will document what it looks like on day 3, 7, 11, 14, 17, 21, etc. They use these observations to discover patterns in how the Moon's shape changes and predict when the next full moon will appear. Students will also investigate why the stars are visible at night but disappear when the Sun comes out during the day by creating a Star Projector. Students will use paper cups to project stars onto a sky picture, and observe what happens to these stars when a flashlight acts as a model of the Sun.

Analyzing and Interpreting Data
Planning and Carrying Out Investigations
Developing and Using Models
Constructing Explanations and Designing Solutions
Obtaining, Evaluating, and Communicating Information
Engaging in Argument from Evidence
Real World Connections
Station Teaching
Project Based learning
Foster Design Thinking
Promoting Empathy
Support EDI
Students discuss how the moon is in the same phase no matter where you are in the world. Mystery science discusses how one person might be in New Jersey, but their friends in Australia and California are also looking at the same phase of the moon. Students also discuss how the sun always rises and sets in the same direction every day all over the world. Mystery science discusses how you can follow the sun if you are ever lost and uses different cities around the world to explore shadows of each city's tourist attraction.

Enduring Understandings

New Jersey State Learning Standards

Earth's Place in the Universe

1-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted.

- ESS1.A: The Universe and its Stars: Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted

1-ESS1-2 Make observations at different times of year to relate the amount of daylight to the time of year.

- ESS1.B: Earth and the Solar System Seasonal patterns of sunrise and sunset can be observed, described, and predicted.

Focus Areas

Knowledge

- How the Sun appears to travel across the sky and that this is due to the Earth's motion, not the Sun's.
- The Moon appears to grow and shrink in the sky based on how much reflected sunlight we can see.
- The four cardinal directions.
- Moons are objects that revolve around planets.
- The Moon shines because it is reflecting sunlight.
- Because the Sun is so close, its brightness keeps us from seeing other stars during the day.
- Seasons are caused by the Earth's tilt.

- The Sun appears to be higher in the sky during the summer and lower in the winter.

Skills

- Make predictions about the Sun's location at various times of the day.
- Label a compass rose.
- Explain how moons are different than planets.
- Make predictions about the Moon's phases.
- Explain how the Sun's presence during the day keeps other stars from being seen.
- Explain how the Earth's tilt causes the seasons.
- Compare and contrast the Sun's location in the sky during the summer and winter months.

Understandings

- Use observations of the sun, moon, and stars to describe patterns that can be predicted.
- Make observations at different times of year to relate the amount of daylight to the time of year.

Resources

Primary Resources

- Mystery Science

Scientific Inquiry

Core

- Could a Statue's Shadow Move
- What does your shadow do when you're not looking (Mystery Science)
- How Can The Sun Help You If You Are Lost? (Mystery Science)
- Why do you have to go to bed early in the summer
- Why do Stars Come Out at Night? (Mystery Science)
- How Can Stars Help You If You Are Lost? (Mystery Science)

Supplemental

- Four Seasons Activity

- Reasons for the Seasons Activity
- All About the Sun
- All About the Moon
- Moon Phases Activity
- All About Stars
- Space Fact Craft
- Neil Armstrong DBQ