1 Science Unit 1: Day Patterns (Sun & Shadows)

Content Area: **Science**
Course(s):
Time Period: **Marking Period 1**
Length: **9 Weeks**
Status: **Published**

Unit Overview

In this unit, students observe that the Sun, Moon, and stars seem to move in patterns in the sky. The make observations of the Sun and shadows throughout the day and across the seasons. They also determine why stars are only visible at night.

Standards

Scientific & Engineering Practices

- Students conduct two investigations. In the first, they place a gnome in the sun and trace its shadow. They observe how the shadow changes as time passes, or as the sun moves across the sky. In their second investigation, they use model gnomes to analyze how to move a light source to change the shape and length of the shadow of the gnome. Interpreting this data, they construct an explanation about what causes a shadow to move.

- Students conduct an investigation to gather information about how their shadow changes throughout the day. They trace their shadow in the morning and afternoon, then analyze the data to identify differences in the shadows. Using the data, they construct an explanation about why their shadows point in different directions

- Students develop a Sun Finder, a model of the Sun's movement across the sky. Using the model, they reason about how the sun can help guide them during the day. Since they know that they walked toward the Sun to get to their friend's house in the morning, they must use evidence to argue whether they should walk toward or away from the Sun to get home in the afternoon.

- Students obtain information about the seasonal patterns of sunrise and sunset through a printable student reader. Students read the text independently to determine seasonal daylight patterns.

- Students make observations of the Moon's appearance over the course of four weeks, drawing pictures of each moon phase. Then, students analyze the data they've gathered in order to answer the question of when the full moon will appear.

- Students develop and use a model of the Big Dipper in the night sky. They carry out an investigation to determine why stars are only visible in the night sky. Students construct an explanation about the stars being outshone by the Sun in the daytime sky, and then being visible again when the Sun sets.

- Students obtain, evaluate, and communicate information about the cardinal directions. They conduct an investigation to determine which direction each part of their classroom is facing.

Crosscutting Concepts

- Students consider the movement of shadows to be caused by the pattern of the sun's movement across the sky.
- Students explain changes in shadows by considering the patterns in the Sun's movement across the sky. They identify the cause and effect relationship between the height of the Sun in the sky and a shadow's length and direction.
- Students analyze the pattern of the Sun's movement across the sky each day
- Students consider the pattern that there are more hours of daylight during the summer than there are in the winter
- Students discover that the Moon's phases follow a cyclical pattern that repeats every four weeks (each month).
- Students consider the pattern that the stars are only visible in the night sky. They explore the cause and effect relationship between the Sun's brightness and the visibility of the stars.
- Students consider the pattern that stars are in different places in the sky during different seasons. They consider the pattern that the Big Dipper help us find the North Star.

1-ESS1-1	Use observations of the sun, moon, and stars to describe patterns that can be predicted.
1-ESS1-2	Make observations at different times of year to relate the amount of daylight to the time of year.

Materials

Core Materials:

- Mystery Science
    - Could a statue's shadow move?
    - What does your shadow do when you're not looking?
    - How can the sun help you if you're lost?
    - Why do you have to go to bed early in the summer?
    - When can you see the full moon?
    - Why do the stars come out at night?
    - How can stars help you if you get lost?
- Teacher Created Labs

Supplemental Materials:

- BrainPop resources
- NewsELA

- GRC Lessons
- TBSAID
- Nearpod Activities

Technology

Technology Literacy

• 9.4.2.TL.1: Identify the basic features of a digital tool and explain the purpose of the tool (e.g., 8.2.2.ED.1).

• 9.4.2.TL.2: Create a document using a word processing application.

• 9.4.2.TL.3: Enter information into a spreadsheet and sort the information.

• 9.4.2.TL.4: Navigate a virtual space to build context and describe the visual content.

• 9.4.2.TL.5: Describe the difference between real and virtual experiences.

• 9.4.2.TL.6: Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).

Technology - Data & Analysis

8.1.2.DA.1: Collect and present data, including climate change data, in various visual formats.

• 8.1.2.DA.3: Identify and describe patterns in data visualizations.

• 8.1.2.DA.4: Make predictions based on data using charts or graphs.

Technology - Effects on the Natural World

• 8.2.2.ETW.1: Classify products as resulting from nature or produced as a result of technology.

• 8.2.2.ETW.2: Identify the natural resources needed to create a product.

• 8.2.2.ETW.3: Describe or model the system used for recycling technology.

• 8.2.2.ETW.4: Explain how the disposal of or reusing a product affects the local and global

Evidence of Learning/Assessment

Formative Assessment

- Teacher Observation
- Quizzes
- Exit Tickets
- Labs

Summative Assessment

- Benchmark Tests
- Alternative Assessments: Performance Tasks & Projects

Accommodations & Modifications

Special Education

Follow IEP Plan which may contain some of the following examples…

- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe
- Newsela leveled reading passages

504

Follow 504 Plan which may contain some of the following examples…

- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe
- Newsela leveled reading passages

ELL

- Translation device/dictionary
- In class/pull out support with ESL teacher
- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud

- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe
- Newsela leveled reading passages

At-risk of Failure

- Extra time during intervention
- In class/pull out support with special ed teacher
- Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Study Guides
- Limit number of questions
- Scribe
- Newsela leveled reading passage

Gifted & Talented

- Independent projects
- STEM Projects
- Leveled Reading with Newsela

Interdisciplinary Connections

Connections to NJSLS - English Language Arts

- W.1.7 Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions). (1-ESS1-1), (1-ESS1-2)
- W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-ESS1-1), (1-ESS1-2)

Connections to NJSLS - Mathematics

- MP.2 Reason abstractly and quantitatively. (1-ESS1-2)
- MP.4 Model with mathematics. (1-ESS1-2)
- MP.5 Use appropriate tools strategically. (1-ESS1-2)

- 1.OA.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations to represent the problem. (1-ESS1-2)
- 1.MD.C.4 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-ESS1-2)

Career Readiness, Life Literacies, and Key Skills

Critical Thinking and Problem Solving:

• 9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).

• 9.4.2.CT.2: Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).

• 9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive).

Career Ready Practices

- CRP6. Demonstrate creativity and innovation.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.