



UNIT 1

SPACE SYSTEMS: PATTERNS AND CYCLES — PART I



Unit 1: Space Systems: Patterns and Cycles

6 weeks

In this first unit, students begin to make observations about patterns of the motion of the sun, moon, and stars. Students will be engaged in observing the movement of the sun and moon across the course of a day and will begin to understand about sunrise and sunset. Students will understand that stars (other than the sun) are visible during the night and not during the day. Telescopes make it possible for us to see and observe objects in the sky with greater detail. Students will also begin to develop an understanding of seasonal patterns of sunrise and sunset. Experiences with these ideas will continue throughout the school year.

Students will use these observations to describe patterns with the sun, moon, and stars. Observations and recordings will begin in this unit and will continue to be made throughout the course of the school year in order to describe and predict patterns in the movement of objects in the sky. This will involve analysis and interpretation of the data collected and recorded.

Unit 1 Performance Expectations

- ❖ **1-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted.**
[Clarification Statement: Examples of patterns could include that the sun and moon appear to rise in one part of the sky, move across the sky, and set; and stars, other than our sun, are visible at night but not during the day.]
[Assessment Boundary: Assessment of star patterns is limited to stars being seen at night and not during the day.]
- ❖ **1-ESS1-2 Make observations at different times of year to relate the amount of daylight to the time of year.** [Clarification Statement: Emphasis is on relative comparisons of the amount of daylight in the winter to the amount in the spring or fall.] [Assessment Boundary: Assessment is limited to relative amounts of daylight, not quantifying the hours or time of daylight.]

In Unit 1, students will understand...

- ❖ Observations can be used to describe patterns in the natural world in order to answer scientific questions.
- ❖ Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
This unit explores these patterns:
 - The Sun appears to rise in one part of the sky, move across the sky, and set.
 - Seasonal patterns of sunrise and sunset can be observed, described, and predicted, and can determine the amount of daylight (longer periods of sunlight in summer, less sunlight in winter).
 - The moon has a pattern which can be observed through its changing phases.
 - Stars, other than our sun, are visible at night but not during the day.

Unit 1 Essential Questions:

- ❖ What objects are in the sky and how do they seem to move?
- ❖ How can we describe and predict patterns of objects in the sky?



Additional Content Connections:

*These connections provide opportunities to score to other content standards with focused instruction.

ELA:

❖ Speaking and Listening

- SL.1.1 Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups
- SL.1.2 Ask and answer questions about key details in a text read aloud or information presented orally or through other media.

Math:

❖ Measurement and Data

- 1.MD.C.6 (formerly 1.MD.C.4) Organize, represent, and interpret data with up to three categories, using tally tables, picture graphs, and bar graphs. Ask and answer questions about the total number represented, how many in each category, and how many more or less are in one category than in another.

Unit Vocabulary:

question
observe/observation
measure
record
predict/prediction

sun
moon
star
Earth
orbit
patterns
seasons

phases
full moon
new moon
crescent moon
quarter moon

*Students should engage with these terms throughout this unit and within other units in 1st grade.



Space Systems: Patterns and Cycles

Students who demonstrate understanding can:

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

[Clarification Statement: Examples of patterns could include that the sun and moon appear to rise in one part of the sky, move across the sky, and set; and stars, other than our sun, are visible at night but not during the day.] [Assessment Boundary: Assessment of star patterns is limited to stars being seen at night and not during the day.]

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

[Clarification Statement: Emphasis is on relative comparisons of the amount of daylight in the winter to the amount in the spring or fall.] [Assessment Boundary: Assessment is limited to relative amounts of daylight, not quantifying the hours or time of daylight.]

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
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. - Make observations (firsthand or from media) to collect data that can be used to make comparisons. (1-ESS1-2) Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. - Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (1-ESS1-1)	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-ESS1-1) ESS1.B: Earth and the Solar System - Seasonal patterns of sunrise and sunset can be observed, described, and predicted. (1-ESS1-2)	Patterns - Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-ESS1-1, 1-ESS1-2) ----- Connections to Nature of Science Scientific Knowledge Assumes an Order and Consistency in Natural Systems - Science assumes natural events happen today as they happened in the past. (1-ESS1-1) - Many events are repeated. (1-ESS1-1)

