

## 1st Grade: Patterns of the Sun, Moon, and Stars

### Standards Bundle

*Standards are listed within the bundle. Bundles are created with potential instructional use in mind, based upon potential for related phenomena that can be used throughout a unit.*

1-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted. (SEP: 4; DCI: ESS1.A ; CCC: Patterns, Technology, nature of science) [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 the year to relate the amount of daylight to the time of year. (SEP: 3; DCI: ESS1.B; CCC: Patterns). [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.]

### Content Overview

*This section provides a generic overview of the content or disciplinary core ideas as an entry point to the standards.*

We can observe patterns where the sun, moons, and stars in the sky can be described and even predicted. Over time, seasons take place and these present patterns as well. These seasonal changes can be described by observing patterns in the sunrise and sunset.

### Phenomena

*Phenomena can be used at varying levels of instruction. One could be used to anchor an entire unit, while another might be more supplemental for anchoring just a unit. Please remember that phenomena should allow students to engage in the SEP and use the CCC/DCI to understand and explain the phenomenon.*

- The moon appears bigger at certain times of the month.
- It's still light outside after you eat supper during the summer.
- You have to wear a coat in the winter in South Dakota.
- It's dark out after you eat supper during the winter.
- The sun is in a different part of the sky each day of the year.

### Storyline

*This section aims to decode not only the DCI connections, but also the SEP and CCC in a detailed account of how they possibly fit together in a progression for student learning, including both rationale and context for the bundle.*

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Planning and Carrying Out Investigations</b></p> <ul style="list-style-type: none"> <li>● Make observations (firsthand or from media) to collect data that can be used to make comparisons.</li> </ul> <p><b>Analyzing and Interpreting Data</b></p> <ul style="list-style-type: none"> <li>● Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.</li> </ul>	<p><b>ESS1.B: Earth and the Solar System</b></p> <ul style="list-style-type: none"> <li>● Seasonal patterns of sunrise and sunset can be observed, described, and predicted.</li> </ul> <p><b>ESS1.A: The Universe and its Stars</b></p> <ul style="list-style-type: none"> <li>● Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted.</li> </ul>	<p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>● Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.</li> </ul>

Students can observe patterns or repeating events related to the sun, moon, and stars in the sky. For example students can see that the sun appears to rise in one part of the sky and set in another. Students can see that stars, other than the sun, are visible at night. Students can also observe seasonal patterns of sunrise and sunset as well as temperatures. Observations are essential in students identifying these patterns. In this bundle of PEs, students are expected to make observations and determine if patterns exist. Once students determine patterns exist, they can use these patterns as evidence to make predictions about future events (the sun will rise in the same part of the sky tomorrow, the amount of daylight in the winter next year will probably be close to what it is this year).

### Formative Assessment

*Formative assessment is crucial because all learners benefit from timely and focused feedback from others. It promotes self-reflection, self-explanation, and social learning. It can also make learning more relevant. Each of the questions below might be used throughout the formative assessment process. Specific prompts may focus on individual practices, core ideas, or crosscutting concepts, but, together, the components need to support inferences about students' three-dimensional science learning as described in a given bundle, standard or lesson-level performance expectation.*

#### **Resources to inform your formative assessment.**

<http://stemteachingtools.org/brief/30>

<http://stemteachingtools.org/brief/41>

<http://stemteachingtools.org/pd/sessionb>

### SEP Planning and Carrying Out Investigation

- Perform an investigation that measures the length of a day in South Dakota.
- Identify questions that clarify the differences the sun's position in the sky.

### SEP Analyzing and Interpreting Data

- Draw conclusions on the length of day by looking at measurements that were taken over several months.

### CCC Patterns

- What patterns do you observe by looking at a moon phase date chart?

### Performance Outcomes

*These are statements of how students use knowledge and are similar to the standards in how they blend DCI, SEP, and CCC, but at a smaller grain-size. These are potential outcomes for instruction as it plays out in lessons and activities in the classroom. It is important to also think of these as smaller outcomes that build toward the larger goal of mastering the standards.*

- **Analyze and interpret** data about the *sun's patterns* to make predictions about the apparent motion of the sun.
- **Analyze and interpret** data about the *moon's patterns* to make predictions about the moon's motion.
- **Make observations to determine** that stars other than our sun appear in the sky at different times of the year.
- **Plan and carry out a simple investigation** that shows at *different times* of the year there are different amounts of daylight.
- **Make comparisons** about seasonal temperature in relation to the amount of daylight the earth receives at *different times* of the year.