

Shadow Patterns

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Grade Level 5th Grade

Course Earth Science, Environmental Science

What is in a phenomenon-driven three-dimensional (3D) instructional set? These science resources use phenomena to facilitate engaging and meaningful learning, instruction, and formative assessment. Each resource set contains a guiding document and three other types of documents: an Instructional Task (IT), a corresponding formative Assessment Task (AT), and a corresponding Pattern Analysis of Student Thinking (PAST). These resources are not intended to be a complete lesson plan. Three-dimensional learning is not limited to one specific type of lesson format and is compatible with most lesson plan models. The IT proposes two or more possible phenomena that could be used to drive an instructional sequence addressing a specific OAS-S standard. It also provides suggestions for engaging students with the phenomena through meaningful learning experiences in three dimensions. The AT focuses on a phenomenon-associated scenario. It contains one or more tasks designed to give students opportunities to show their thinking and provide evidence-based explanations about the disciplinary core ideas (DCIs) using crosscutting concepts and scientific practices for that standard. The PAST document is directly associated with the AT. It describes the intended purpose of each part of the AT and includes relevant student response themes to help teachers identify patterns of student thinking. It also provides guidance and insight into how to interpret student responses and possible instructional moves for facilitating student understanding of a specific DCI concept. Individual teachers can use the PAST as a tool to construct a rubric for the AT.

Performance Expectation (PE)

Represent data in graphical displays to reveal patterns of day and night, daily changes in the length and direction of shadows, and the seasonal appearance of certain stars in the sky.

Disciplinary Core Ideas (DCI)

The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its north and south poles, cause observable patterns. These patterns include day and night, daily changes in the length and direction of shadows, and different positions of the sun, moon, and stars at different times of the day, month, and year.

Resource Attachments

Phenomenon-Based Instructional Task

- 5-ESS1-2-IT-Shadow-Patterns.pdf
- Guide-to-using-a-Phenomenon-Driven-Three-Dimensional-Instructional-Set-3-6-19.pdf

Formative Assessment Task

- 5-ESS1-2-AT-Shadow-Patterns.pdf

Pattern Analysis of Student Thinking (PAST)

- 5-ESS1-2-PAST-Shadow-Patterns.pdf