

DRAFT - New York State P-12 Science Learning Standards – DRAFT

P. Earth and Space Sciences

Students who demonstrate understanding can:

P-ESS1-1. Observe and describe the apparent motions of the Sun, moon, and stars to recognize predictable patterns.

[Clarification Statement: Examples of patterns could include that the Sun and moon appear to move across the sky in a predictable pathway; day and night follow predictable patterns; seasons change in a cyclical pattern (e.g. summer follows spring, autumn follows summer); the moon's shape appears to change in a cyclical pattern; and stars other than our Sun can be visible at night depending on local weather conditions.]

P-ESS2-1. Ask questions, make observations, and collect and record data using simple instruments to recognize patterns about how local weather conditions change daily and seasonally.

[Clarification Statement: Emphasis is on daily weather conditions recorded over a period of time and how those conditions impact student activities and what clothes they wear. Examples of local weather conditions could include cloud cover (sunny, partly cloudy, cloudy, foggy), precipitation (no precipitation, snow, hail, rain), wind (no wind, some wind, strong wind), and temperature (cold, cool, warm, hot).] [Assessment Boundary: Assessment is limited to qualitative measures of local weather conditions.]

P-PS3-1. Plan and conduct an investigation to determine the effect of sunlight on Earth's surface. [Clarification Statement: Examples of effects could include illumination, shadows casted, and the warming effect on living organisms and nonliving things.] [Assessment Boundary: Assessment of effects is limited to relative measures: e.g. warm/cool, bright/dark.]

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

Asking Questions and Defining Problems

Asking questions and defining problems in grades PK–2 builds on prior experiences and progresses to simple descriptive questions that can be tested.

- Ask questions based on observations to find more information about the designed world. (P-ESS2-1)

Planning and Carrying Out Investigations

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

- With guidance, plan and conduct an investigation in collaboration with peers. (P-PS3-1)
- Make observations (firsthand or from media) to collect data that can be used to make comparisons. (P-ESS2-1)

Analyzing and Interpreting Data

Analyzing data in PK–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. (P-ESS1-1)
- Analyze data from tests of an object or tool to determine if it works as intended. (P-PS3-1),(P-ESS2-1)

Connections to Nature of Science

Scientific Investigations Use a Variety of Methods

- Scientists use different ways to study the world. (P-ESS1-1),(P-ESS2-1),(P-PS3-1)

Disciplinary Core Ideas

PS3.B: Conservation of Energy and Energy Transfer

- Sunlight warms Earth's surface. (P-PS3-1)

PS4.B: Electromagnetic Radiation

- Objects can be seen if light is available to illuminate them or if they give off their own light. (P-PS3-1)

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. (P-ESS1-1)

ESS1.B: Earth and the Solar System

- Seasonal patterns of sunrise and sunset can be observed, described, and predicted. (P-ESS1-2)

ESS2.D: Weather and Climate

- Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time. (P-ESS2-1)

ESS3.B: Natural Hazards

- Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. (P-ESS2-1)

Crosscutting Concepts

Patterns

- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (P-ESS1-1),(P-ESS2-1)

Cause and Effect

- Simple tests can be designed to gather evidence to support or refute student ideas about causes. (P-ESS2-1),(P-PS3-1)

Connections to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology

- People encounter questions about the natural world every day. (P-ESS2-1)

Influence of Engineering, Technology, and Science on Society and the Natural World

- People depend on various technologies in their lives; human life would be very different without technology. (P-ESS2-1)

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

- Science assumes natural events happen today as they happened in the past. (P-ESS1-1)
- Many events are repeated. (P-ESS1-1)

Connections to other DCIs in prekindergarten: **P.PS2.A** (P-ESS1-1)

Articulation of DCIs across grades K-1: **K.PS3.B** (P-ESS3-1); **K.ESS2.D** (P-ESS2-1); **K.ESS3.B** (P-ESS2-1); **1.ESS1.A** (P-ESS1-1); **1.ESS1.B** (P-ESS1-1);

New York State P-12 Common Core Learning Standards Connections:

ELA/Literacy –

- RI.PK.1** With prompting and support, ask and answer questions about details in a text. (P-ESS1-1),(P-ESS2-1),(P-PS3-1)
- RI.PK.4** Exhibit curiosity and interest in learning new vocabulary (e.g., ask questions about unfamiliar vocabulary). (P-ESS1-1),(P-ESS2-1),(P-PS3-1)
- RI.PK.10** With prompting and support, actively engage in group reading activities with purpose and understanding. (P-ESS1-1),(P-ESS2-1),(P-PS3-1)
- W.PK.1** With prompting and support, use a combination of drawing, dictating, or writing to express an opinion about a book or topic (e.g., I like.... because...) (P-ESS1-1),(P-ESS2-1),(P-PS3-1)
- W.PK.2** With prompting and support, use a combination of drawing, dictating, or writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. (P-ESS1-1),(P-ESS2-1),(P-PS3-1)
- W.PK.3** With prompting and support, use a combination of drawing, dictating, or writing to narrate a single event and provide a reaction to what happened. (P-ESS1-1),(P-ESS2-1),(P-PS3-1)
- W.PK.8** With guidance and support, recall information from experiences or gather information from provided sources to answer a question. (P-ESS1-1),(P-ESS2-1),(P-PS3-1)
- SL.PK.2** With guidance and support, confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood. (P-ESS1-1),(P-ESS2-1),(P-PS3-1)
- SL.PK.3** With guidance and support, ask and answer questions in order to seek help, get information, or clarify something that is not understood. (P-ESS1-1),(P-ESS2-1),(P-PS3-1)
- SL.PK.5** Add drawings or other visual displays to descriptions as desired to provide additional detail. (P-ESS1-1),(P-ESS2-1),(P-PS3-1)

Mathematics –

- MP.1** Make sense of problems and persevere in solving them. (P-ESS1-1),(P-ESS2-1)
- MP.5** Use appropriate tools strategically. (P-ESS2-1)
- PK.CC.5** Identify whether the number of objects in one group is more, less, greater than, fewer, and/or equal to the number of objects in another group, e.g., by using matching and counting strategies. 1:1 (up to 5 objects) (P-ESS2-1)
- PK.G.1** Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as top, bottom, up, down, in front of, behind, over, under, and next to. (P-ESS1-1)
- PK.OA.2** Duplicate and extend (e.g., What comes next?) simple patterns using concrete objects. (P-ESS1-1), (P-ESS2-1)
- PK.G.3** Analyze, compare, and sort two- and three-dimensional shapes and objects, in different sizes, using informal language to describe their similarities, differences, and other attributes (e.g., color, size, and shape). (P-PS3-1)
- PK.G.4** Create and build shapes from components (e.g., sticks and clay balls). (P-ESS1-1),(P-PS3-1)

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The text in the "Disciplinary Core Ideas" section is reproduced verbatim from *A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas* unless it is preceded by (NYSED).