K. Weather and Climate

Students who demonstrate understanding can:

K-PS3.1. Make observations to determine the effect of sunlight on Earth’s surface. [Clarification Statement: Examples of Earth’s surface could include sand, soil, rocks, and water] [Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.]

K-PS3.2. Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.* [Clarification Statement: Examples of qualitative observations could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]

K-ESS2.1. Use and share observations of local weather conditions to describe patterns over time. [Clarification Statement: Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, and warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months.] [Assessment Boundary: Assessment of quantitative observations limited to whole numbers and relative measures such as warmer/cooler.]

K-ESS3.2. Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.* [Clarification Statement: Emphasis is on local forms of severe weather.]

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
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data
- Obtaining, Evaluating, and Communicating Information

Disciplinary Core Ideas

- PS3.B: Conservation of Energy and Energy Transfer
  - Sunlight warms Earth’s surface. (K-PS3-1), (K-PS3-2)
  - 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. (K-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. (K-ESS3-2)

- ETS1.A: Defining and Delimiting an Engineering Problem
  - Asking questions, making observations, and gathering information are helpful in thinking about problems. (secondary to K-ESS3-2)

Crosscutting Concepts

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

- Cause and Effect
  - Events have causes that generate observable patterns. (K-PS3-1), (K-PS3-2), (K-ESS2-1)

- Connections to Engineering, Technology, and Applications of Science

Connections to Nature of Science

- Scientific Investigations Use a Variety of Methods
- Science Knowledge is Based on Empirical Evidence

Connections to other DCIs in kindergarten:

- K.ETS1.A (K-PS3-2), (K-ESS3-2); K.ETS1.B (K-PS3-2)
- Articulation of DCIs across grade levels:
  - K.EPS4.B (K-PS3-1), (K-PS3-2); 2.ESS1.C (K-ESS3-2); 2.ESS2.A (K-ESS2-1); 2.ETS1.B (K-PS3-2); 3.ESS2.D (K-PS3-1), (K-ESS2-1); 3.ESS3.B (K-ESS3-2); 4.ESS2.A (K-ESS2-1); 4.ESS3.B (K-ESS3-2); 4.ETS1.A (K-PS3-2)

Common Core State Standards Connections:

- ELA/Literacy – RI.K.1
  - With prompting and support, ask and answer questions about key details in a text. (K-ESS3-2)
- W.K.7
  - Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-PS3-1), (K-PS3-2), (K-ESS2-1)
- SL.K.3
  - Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-ESS2-3)

- Mathematics –
  - MP.2
    - Reason abstractly and quantitatively. (K-ESS2-1)
  - K.CC
    - Counting and Cardinality (K-ESS3-2)
  - K.CC.A
    - Know number names and the count sequence. (K-ESS2-1)
  - K.MD.A.1
    - Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-ESS2-1)
  - K.MD.A.2
    - Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. (K-PS3-1), (K-PS3-2)
  - K.MD.B.3
    - Classify objects into given categories; count the number of objects in each category and sort the categories by count. (K-ESS2-1)

*The performance expectations marked with an asterisk are integrated with disciplinary core ideas.*