

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

K. Weather and Climate

Students who demonstrate understanding can:

- 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 and local resources available for preparedness measures.]
- 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 structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]

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 |
|---|--|--|
| <p>Asking Questions and Defining Problems Asking questions and defining problems in grades K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested.</p> <ul style="list-style-type: none"> ▪ Ask questions based on observations to find more information about the designed world. (K-ESS3-2) <p>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.</p> <ul style="list-style-type: none"> ▪ Make observations (firsthand or from media) to collect data that can be used to make comparisons. (K-PS3-1) <p>Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> ▪ Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-ESS2-1) <p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.</p> <ul style="list-style-type: none"> ▪ Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2) <p>Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.</p> <ul style="list-style-type: none"> ▪ Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. (K-ESS3-2) <p style="text-align: center;">----- <i>Connections to Nature of Science</i> -----</p> <p>Scientific Investigations Use a Variety of Methods</p> <ul style="list-style-type: none"> ▪ Scientists use different ways to study the world. (K-PS3-1) <p>Science Knowledge is Based on Empirical Evidence</p> <ul style="list-style-type: none"> ▪ Scientists look for patterns and order when making observations about the world. (K-ESS2-1) | <p>PS3.B: Conservation of Energy and Energy Transfer</p> <ul style="list-style-type: none"> ▪ Sunlight warms Earth’s surface. (K-PS3-1),(K-PS3-2) <p>ESS2.D: Weather and Climate</p> <ul style="list-style-type: none"> ▪ 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) <p>ESS3.B: Natural Hazards</p> <ul style="list-style-type: none"> ▪ 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) <p>ETS1.A: Defining and Delimiting an Engineering Problem</p> <ul style="list-style-type: none"> ▪ Asking questions, making observations, and gathering information are helpful in thinking about problems. (<i>secondary to K-ESS3-2</i>) | <p>Patterns</p> <ul style="list-style-type: none"> ▪ Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (K-ESS2-1) <p>Cause and Effect</p> <ul style="list-style-type: none"> ▪ Events have causes that generate observable patterns. (K-PS3-1),(K-PS3-2),(K-ESS3-2) <p style="text-align: center;">----- <i>Connections to Engineering, Technology, and Applications of Science</i> -----</p> <p>Interdependence of Science, Engineering, and Technology</p> <ul style="list-style-type: none"> ▪ People encounter questions about the natural world every day. (K-ESS3-2) <p>Influence of Engineering, Technology, and Science on Society and the Natural World</p> <ul style="list-style-type: none"> ▪ People depend on various technologies in their lives; human life would be very different without technology. (K-ESS3-2) |

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: **1.PS4.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:

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| <i>ELA/Literacy –</i> | |
| 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-ESS3-2) |
| <i>Mathematics –</i> | |
| MP.2 | Reason abstractly and quantitatively. (K-ESS2-1) |
| MP.4 | Model with mathematics. (K-ESS2-1),(K-ESS3-2) |
| 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 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).