

## THIRD GRADE: CLIMATE

### 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.*

3-ESS-2-1 Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. (SEP: 4; DCI: ESS2.D; CCC: Patterns) *[Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction.] [Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.]*

3-ESS-2-2 Obtain and combine information to describe climates in different regions of the world. (SEP: 8; DCI: ESS2.D ; CCC: Patterns)

3-ESS-3-1 Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard. (SEP: 7; DCI: ESS3.B ; CCC: Cause/Effect, Technology) *[Clarification Statement: Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lightning rods.]*

### Content Overview

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

Weather changes through the course of a year as well as over an extended period of time. Meteorologists have used data tables to show these changes over time. Seasonal patterns help us predict future weather. Scientists have also collected and recorded data about climates over different regions. By studying weather and climate conditions over a period of time we build a better understanding of hazards (i.e. blizzard, tornado, hurricane, etc) due to weather. The data collected helps us design solutions and make claims to reduce the impacts of those hazards.

### 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.*

- Different weather patterns seen in each season.
- Heat wave during the summer.
- During the 2011 flooding, thousands of sandbags were filled and placed along the Missouri River.
- Snow fences or rows of trees are placed along the road during winter months.
- One of the six dams on the Missouri River breaks.
- When planning a vacation to a different country you need to know what kind of clothes to pack.

## 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>Analyzing and Interpreting Data</b></p> <ul style="list-style-type: none"> <li>Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships.</li> </ul> <p><b>Obtaining, Evaluating, and Communicating</b></p> <ul style="list-style-type: none"> <li>Obtain and combine information from books and other reliable media to explain phenomena.</li> </ul> <p><b>Engaging in Argument from Evidence</b></p> <ul style="list-style-type: none"> <li>Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.</li> </ul> | <p><b>ESS2.D: Weather and Climate</b></p> <ul style="list-style-type: none"> <li>Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next.</li> </ul> <p><b>ESS2.D: Weather and Climate Climate</b></p> <ul style="list-style-type: none"> <li>Describes a range of an area's typical weather conditions and the extent to which those conditions vary over years.</li> </ul> <p><b>ESS3.B: Natural Hazards</b></p> <ul style="list-style-type: none"> <li>A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts</li> </ul> | <p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>Patterns of change can be used to make predictions.</li> </ul> <p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>Cause and effect relationships are routinely identified, tested, and used to explain change.</li> </ul> |

Students are expected to acquire data about weather conditions during various seasons and in various regions around the world. They should represent the patterns of weather present during different seasons on tables and graphs, as well as evaluate and communicate this data. By constructing simple explanations about the causes of hazards related to weather students can make a claim and design a solution to reduce those impacts.

Students can record weather data (temperature, precipitation amounts and types of precipitation) in their area over a period of time. Given an opportunity to

research information through research from books and media about other regional climates they can learn about different regions in the world. Students should create a graph or chart of the information in order to see weather and climate patterns over time. By analyzing data of recorded weather from regions north, south, east, or west of their local region, students can determine the patterns in weather and the impact the atmospheric conditions from different directions have on their region. By the end of this unit, they will be able to predict future weather in their area and see global patterns of weather which attribute to the climates in different regions.

### **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 Developing and Using Models**

- Create a chart that shows the different types of weather pattern (precipitation, temperature, wind, clouds, sunny, etc.) data collected over a period of time.
- Create charts that show the average amount of precipitation and temperature in different climates.

### **SEP Analyzing and Interpreting Data**

- Compare and contrast different weather patterns that occur in at least three different climates around the world.
- Create a chart that shows the amount of moisture in different climates around the the world.

### **CCC Cause and Effect**

- What causes different climates around the world?
- What causes weather to change from day to day?
- Explain the cause of a weather related hazard and how we can reduce the impact of such hazard.

### **CCC Patterns**

- What patterns of weather can be identified throughout the United States?
- What patterns of weather can be identified in different regions of the world?
- What patterns of weather can be identified within each season?

## 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.*

- **Develop and use models** to show how weather systems patterns change over time.
- **Construct an explanation** of a solution that reduces the impact of weather-related hazards during *different times of the year*.
- **Obtain and evaluate information** that *explains the different climates* throughout different regions of the world.
- **Communicate information** of weather systems that *change throughout the year in various regions*.
- **Develop a model** that describes typical *weather patterns* during particular seasons in a specific region.