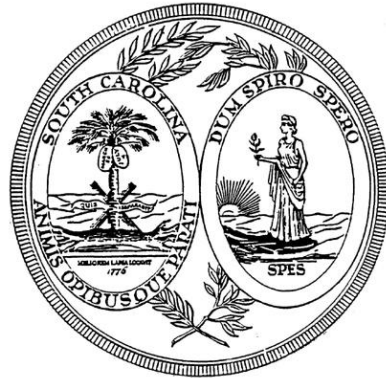


South Carolina Academic Standards and Performance Indicators for Science 2014



Instructional Unit Resource

2nd Grade

South Carolina Academic Standards and Performance Indicators for Science 2014

Second Grade Science Instructional Unit Resource

As support for implementing the *South Carolina Academic Standards and Performance Indicators for Science 2014*, the standards for Second Grade have been grouped into possible units. In the Overview of Units below, the titles for those possible units are listed in columns. Refer to the Overview document to note these unit titles and how Standards, Conceptual Understandings, Performance Indicators, Science and Engineering Practices, and Crosscutting Concepts align. Following the Overview of Units, an Instructional Unit document is provided that delivers guidance and possible resources in teaching our new *South Carolina Academic Standards and Performance Indicators for Science 2014*. The purpose of this document is to provide guidance as to how all the standards in this grade may be grouped into units and how those units might look. Since this document is merely guidance, districts should implement the standards in a manner that addresses the district curriculum and the needs of students. This document is a living document and instructional leaders from around the state will continuously update and expand these resource documents. These documents will be released throughout the 2016-2017 school year with the intentionality of staying ahead of instruction. Teachers should also note that links to the Standards document, A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas, the SEP Support Document, and the Support Document 2.0 are embedded throughout the Instructional Unit format for reference.

Acknowledgments

Jean Baptiste Massieu, famous deaf educator, made a statement that is now considered a French proverb. “Gratitude is the memory of the heart. Indeed, appreciation comes when you feel grateful from the depths of your heart. The head keeps an account of all the benefits you received and gave. But the heart records the feelings of appreciation, humility, and generosity that one feels when someone showers you with kindness.” It is with sincere appreciation that we humbly acknowledge the dedication, hard work and generosity of time provided by teachers and instructional leaders across the state that have made and are continuing to make the Instructional Unit Resources possible.

Grade 2 Overview of Units

Unit 1	Unit 2		Unit 3	Unit 4	
EARTH SCIENCE: WEATHER	PHYSICAL SCIENCE: SOLIDS AND LIQUIDS		PHYSICAL SCIENCE: EXPLORING PUSHES AND PULLS	LIFE SCIENCE: ANIMALS AND THEIR ENVIRONMENT	
Standard	Standard		Standard	Standard.	
2.E.2	2.P.3		2.P.4	2.L.5	
Conceptual Understanding	Conceptual Understanding		Conceptual Understanding	Conceptual Understanding	
2.E.2A	2.P.3A	2.P.3B	2.P.4A	2.L.5A	2.L.5B
Performance Indicators	Performance Indicators		Performance Indicators	Performance Indicators	
2.E.2A.1 2.E.2A.2 2.E.2A.3 2.E.2A.4	2.P.3A.1 2.P.3A.2 2.P.3A.3 2.P.3A.4	2.P.3B.1 2.P.3B.2 2.P.3B.3	2.P.4A.1 2.P.4A.2 2.P.4A.3 2.P.4A.4 2.P.4A.5	2.L.5A.1 2.L.5A.2 2.L.5A.3	2.L.5B.1 2.L.5B.2 2.L.5B.3 2.L.5B.4
*Science and Engineering Practices	*Science and Engineering Practices		*Science and Engineering Practices	*Science and Engineering Practices	
2.S.1A.2 2.S.1A.4 2.S.1A.8	2.S.1A.2 2.S.1A.3 2.S.1A.4 2.S.1A.7 2.S.1A.8		2.S.1A.2 2.S.1A.3 2.S.1A.4 2.S.4A.3 2.S.1B.1	2.S.1A.2 2.S.1A.4 2.S.1A.6 2.S.1A.8	
*CrossCutting Concepts	*CrossCutting Concepts		*CrossCutting Concepts	*CrossCutting Concepts	
1, 2, 3, 7	1, 2, 5, 6		1, 2, 3, 4, 5, 6, 7	1, 2, 5, 6, 7	

**Teachers have the discretion to enhance the selected SEPs and CCCs.*

Unit Title

Earth Science: Weather

Standardhttp://ed.sc.gov/scdoe/assets/file/agency/ccr/Standards-Learning/documents/South_Carolina_Academic_Standards_and_Performance_Indicators_for_Science_2014.pdf

2.E.2 The student will demonstrate an understanding of the daily and seasonal weather patterns.

Conceptual Understanding

2.E.2A. Weather is the combination of sunlight, wind, precipitation (rain, sleet, snow, and hail), and temperature in a particular region at a particular time. Scientists measure and record these conditions to describe the weather and to identify patterns over time. Weather scientists (meteorologists) forecast severe weather so that communities can prepare for and respond to these events.

New Academic Vocabulary

Some students may need extra support with the following academic vocabulary in order to understand what they are being asked to understand and do. Teaching these terms in an instructional context is recommended rather than teaching the words in isolation. A great time to deliver explicit instruction for the terms would be during the modeling process. Ultimately, the student should be able to use the academic vocabulary in conversation with peers and teachers. These terms are pulled from the essential knowledge portion of the Support Doc 2.0 (<http://ed.sc.gov/instruction/standards-learning/science/support-documents-and-resources/>) and further inquiry into the terms can be found there.

Weather	Pattern	Temperature	Thermometer	Celsius
Fahrenheit	Precipitation	Gauge	Wind direction	Wind vane
Wind speed	Meteorologist	Winter	Spring	Summer
Fall/Autumn	Flood	Lightning storm	Tornado	Hurricane
Thunderstorm				

Performance Indicators

Text highlighted below in *orange* and *italicized/underlined* shows connections to SEP's

2.E.2A.1 *Analyze and interpret* data from observations and measurements to describe local weather conditions (including temperature, wind, and forms of precipitation).

2.E.2A.2 *Analyze* local weather data to predict daily and seasonal patterns over time.

2.E.2A.3 Develop and use models to describe and compare the effects of wind (moving air) on objects.

2.E.2A.4 Obtain and communicate information about severe weather conditions to explain why certain safety precautions are necessary.

*Science and Engineering Practices

Support for the guidance, overviews of learning progressions, and explicit details of each SEP can found in the Science and Engineering Support Doc (http://ed.sc.gov/scdoe/assets/File/instruction/standards/Science/Support%20Documents/Complete_2014SEPsGuide_SupportDoc2_0.pdf). It is important that teachers realize that the nine science and engineering practices are not intended to be used in isolation. Even if a performance indicator for a given standard only lists one of the practices as a performance expectation, scientists and engineers do not use these practices in isolation, but rather as part of an overall sequence of practice. When educators design the learning for their students, it is important that they see how a given performance expectation fits into the broader context of the other science and engineering practices. This will allow teachers to provide comprehensive, authentic learning experiences through which students will develop and demonstrate a deep understanding of scientific concepts.

2.S.1.A.2 Develop, use, and refine models to (1) understand or represent phenomena, processes, and relationships, (2) test devices or solutions, or (3) communicate ideas to others. 4S.1A.3 Plan and conduct scientific

2.S.1.A.4 Analyze and interpret data from informational texts, observations, measurements, or investigations using a range of methods (such as tabulation or graphing) to (1) reveal patterns and construct meaning or (2) support hypotheses, explanations, claims, or designs

2.S.1.A.8 Obtain and evaluate informational texts, observations, data collected, or discussions to (1) generate and answer questions, (2) understand phenomena, (3) develop models, or (4) support hypotheses, explanations, claims, or designs. Communicate observations and explanations using the conventions and expectations of oral and written language.

*Cross Cutting Concepts (<http://www.nap.edu/read/13165/chapter/8>)

The link above provides support from the Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas (2012) The text in **blue** and *italicized/underlined* below provides a brief explanation of how the specific content ties to the CCC's.

1. **Patterns:** The National Research Council (2012) states “observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them” (p. 84). *Patterns of weather can be used to describe the weather conditions of seasons. Patterns in weather data can be used to make predictions.*

2. **Cause and effect:** The National Research Council (2012) states that “events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts” (p. 84). *Severe weather causes specific dangers that can be avoided by following appropriate safety procedures.*

3. **Scale, proportion, and quantity:** The National Research Council (2012) states that “In considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system’s structure

or performance. (p. 84). [Severe weather conditions occur on a larger scale than regular weather phenomena, but result from similar conditions on a larger scale.](#)

7. **Stability and change:** The National Research Council (2012) states that “For natural and built systems alike, conditions of stability and determinants of rates of change or evolution of a system are critical elements of study” (p. 84). [Weather changes in patterns can be observed and effect the stability of local weather conditions.](#)

**Teachers have the discretion to enhance the selected SEP’s and CCC’s.*

Prior Knowledge

- K.E.3A.1 Weather patterns, local weather conditions, and weather patterns
- K.E.3 Daily and seasonal weather patterns

Subsequent Knowledge

- 4.E.2B.1 Weather patterns, local weather conditions, and predict changes in weather
- 4.E.2B.2 Impact of severe weather phenomena
- 6.E.2B.1 Weather (wind speed/direction, temperature, humidity, cloud types, and air pressure)
- 6.E.2B.2 Air masses, including thunderstorms, hurricanes and tornadoes
- 6.E.2B.3 Global winds

Possible Instructional Strategies/Lesson

Strategies and lessons that will enable students to master the standard and/or indicator.

- [Moving Air Balloon Experiment](#) This experiment shows how warm air (expansion of balloon) is different than cold air. This resource can be found at <http://www.sciencekids.co.nz/experiments/heavyair.html>
- [Wind Speed Experiment](#) Design an anemometer to test wind speeds. This resource can be found at http://www.sciencebuddies.org/science-fair-projects/project_ideas/Weather_p008.shtml#background
- [Wind Vane Lesson](#) Create your own wind vane to observe wind direction. This resource can be found at <http://www.ciese.org/curriculum/weatherproj2/en/docs/windvane.shtml>

- Snowflake Make a crystal snowflake. This resource can be found at <http://www.sciencekids.co.nz/experiments/snowflake.html>
- How to measure the wind? By using a kite, students will be able to describe and compare the effects of wind on objects. This resource can be found at <http://www.ciese.org/curriculum/weatherproj2/en/docs/windvane.shtml><http://www.gkites.com/howtofly/wind2.html>
- Model the Effects of Wind Observe and record the effects that moving air (wind, fan) has on the movement of a variety of objects (pinwheels, balls, windmill blades). Draw cause and effect models that describe the effects that moving air of various strengths and direction has on objects.

Resources

- Seasons- video This resource can be found at <https://www.youtube.com/watch?v=D6yQ8-M8rmU&noredirect=1>
- Seasons -informative pages This resource can be found at <http://theimaginationnook.blogspot.com/2014/11/whats-weather.html>
- Severe Weather-video This resource can be found at <http://www.sciencekids.co.nz/videos/weather.html>
- Hurricane -informative pages This resource can be found at <http://www.weatherwizkids.com/weather-hurricane.htm>
- Thunderstorms-informative pages This resource can be found at <http://www.weatherwizkids.com/weather-thunderstorms.htm?BackLink=7199&http%3A%2F%2Fwww.weatherwizkids.com%2Fweather-thunderstorms.htm>
- Severe Weather- Crash Course Kids #28.2-video This resource can be found at <https://www.youtube.com/watch?v=QVZExLOOMWA>
- Weatherwhizkids.com This website provides activities, information, and interactives. This resource can be found at <http://www.weatherwizkids.com/>
- The Language of Science Earth/Space Science 3-5: Weather: Tornadoes and Hurricanes video Vocabulary reinforcement for weather vocabulary. This resource can be found at <https://www.youtube.com/watch?v=kDJ6HZ22OBM&index=2&list=PLcpcmculcNFmH-ugoLjLM27tauY-rRkOR>

Sample Formative Assessment Tasks/Questions

Additional sample formative assessment tasks/questions for grade bands are located at the end of each of the SEP Support Doc

(http://ed.sc.gov/scdoe/assets/File/instruction/standards/Science/Support%20Documents/Complete_2014SEPsGuide_SupportDoc2_0.pdf)

- Using a teacher-created chart of weather data including temperature and weather conditions, students will predict the temperature and weather for three days.
- Create a storm safety poster that describes the dangers of the storm and what safety measures need to be taken.
- Have students predict the impact on moving air (wind) on various objects by drawing models and/or making written predictions.

References

Center for Innovation in Engineering and Science Education. (2007) *Make and Use a Wind Vane to determine Wind Direction*. Retrieved from <http://www.ciese.org/curriculum/weatherproj2/en/docs/windvane.shtml>

Crash Course Kids (2015, Sept. 25). *Severe Weather: Crash Course Kids #28.2* [Video File]. Retrieved from <https://www.youtube.com/watch?v=3DQzVZExL00MWA>

Konechy, K. (2014, November, 11). What's the Weather? [Web log post] Message posted to <http://theimaginationnook.blogspot.com/2014/11/whats-weather.html>

Lincks, T. (2014, December 8). *The Language of Science Earth/Space Science 3-5: Weather: Tornadoes and Hurricanes* [Video File]. Retrieved August 3, 2016, from <https://www.youtube.com/watch?v=kDJ6HZ22OBM&index=2&list=PLcpcmcuIcNFmH-ugoLjLM27tauY-rRkOR>.

National Research Council. *A Framework for k-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas*. Washington, DC: The National Academies Press, 2012. doi: 10.17226/13165.

Science Buddies Staff. (2014, June 30). *How Does a Wind Meter Work?*. Retrieved July 24, 2016 from http://www.sciencebuddies.org/science-fair-projects/project_ideas/Weather_p008.shtml

Science Kids. (n.d.) In Science Experiments for Kids. Retrieved from <http://www.sciencekids.co.nz/experiments/heavyair.html>

Science Kids (n.d.) In Science Experiments for Kids. Retrieved from <http://www.sciencekids.co.nz/experiments/snowflake.html>

Science Kids (n.d.) In Science Weather Videos. [Video File] Retrieved from <http://www.sciencekids.co.nz/videos/weather.html>

Socratica Kids(2013, October 29). *Let's Learn About the Four Seasons - Spring, Summer, Fall, and Winter - Science for Kids*. [Video File] Retrieved from <https://www.youtube.com%2Fwatch%3Fv%3DD6yQ8-M8rmU>

South Carolina Department of Education. (2015). South Carolina Academic Standards and Performance Indicators for Science 2014. Retrieved from http://ed.sc.gov/scdoe/assets/file/agency/ccr/StandardsLearning/documents/South_Carolina_Academic_Standards_and_Performance_Indicators_for_Science_2014.pdf

Weather Wiz Kids (n.d.) Hurricanes. Retrieved from <http://www.weatherwizkids.com/weather-hurricanes.html>

Weather Wiz Kids (n.d.) *Thunderstorms*. [Video File] Retrieved from <http://www.weatherwizkids.com/weather-thunderstorms.html>

Wicker, C. (n.d.) Weather Wiz Kids {Web log post} Message posted to <http://www.weatherwizkids.com/>