South Carolina Academic Standards and Performance Indicators for Science 2014

Instructional Unit Resource

Kindergarten

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Kindergarten Science Instructional Unit Resource

As support for implementing the *South Carolina Academic Standards and Performance Indicators for Science 2014*, the standards for Kindergarten 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.

Kindergarten Overview of Units

Unit 1	Unit 2	Unit 3
LIFE SCIENCE: EXPLORING ORGANISMS AND THE ENVIRONMENT	EARTH SCIENCE: EXPLORING WEATHER PATTERNS	PHYSICAL SCIENCE: EXPLORING PROPERTIES OF OBJECTS AND MATERIALS
Standard	**Standard**	**Standard**
K.L.2	K.E.3	K.P.4
Conceptual Understanding	**Conceptual Understanding**	**Conceptual Understanding**
K.L.2A	K.E.3A	K.P.4A
Performance Indicators	**Performance Indicators**	**Performance Indicators**
K.L.2A.1 K.L.2A.2 K.L.2A.3 K.L.2A.4 K.L.2A.5 K.L.2A.6	K.E.3A.1 K.E.3A.2 K.E.3A.3 K.E.3A.4	K.P.4A.1 K.P.4A.2 K.P.4A.3
***Science and Engineering Practices**	***Science and Engineering Practices**	***Science and Engineering Practices**
K.S.1A.2 K.S.1A.3 K.S.1A.4 K.S.1A.6 K.S.1A.8	K.S.1A.2 K.S.1A.4 K.S.1A.8 K.S.1B.1	K.S.1A.1 K.S.1A.3 K.S.1A.4 K.S.1A.8
***Crosscutting Concepts**	***Crosscutting Concepts**	***Crosscutting Concepts**
1,2,6	1,2,7	1,3

**Teachers have the discretion to enhance the selected SEP's and CCCs.*

Unit Title
Earth Science: Exploring Weather Patterns
Standard http://ed.sc.gov/scdoe/assets/file/agency/ccr/Standards-Learning/documents/South_Carolina_Academic_Standards_and_Performance_Indicators_for_Science_2014.pdf
K.E.3: The student will demonstrate an understanding of daily and seasonal weather patterns

Conceptual Understanding
K.E.3A. Weather is a combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. Scientists measure weather conditions to describe and record the weather and to notice patterns over time. Plants and animals (including humans) respond to different weather conditions in different ways.
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.**

Animal	Cloud cover	Fall	Hibernation	Migration
Plant	Precipitation	Rain	Seasons	Snow
Temperature	Weather	Weather symbols	Wind	Autumn
Patterns	Summer	Spring	Winter	

Performance Indicators **Text highlighted below in *orange* and *italicized/underlined* shows connections to SEP's**
K.E.3A.1 *Analyze and interpret* local weather condition *data* (including precipitation, wind, temperature, and cloud cover) to describe weather patterns that occur from day to day, using simple graphs and pictorial weather symbols. K.E.3A.2 *Develop and use models* to predict seasonal weather patterns and changes. K.E.3A.3 *Obtain and communicate information* to support claims about how changes in seasons affect plants and animals. K.E.3A.4 Define problems caused by the effects of weather on human activities and *design solutions or devices* to solve the problem.
***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.

K.S.1A.2 Develop and use models to (1) understand or represent phenomena, processes, and relationships, (2) test devices or solutions, or (3) communicate ideas to others.
K.S.1A.4 Analyze and interpret data from observations, measurements, or investigations to understand patterns and meanings.
K.S.1A.8 Obtain and evaluate informational texts, observations, data collected, or discussions to (1) generate and answer questions about the natural world, (2) understand phenomena, (3) develop models, or (4) support explanations. Communicate observations and explanations using oral and written language.
K.S.1B.1 Construct devices or design solutions to solve specific problems or needs: (1) ask questions to identify problems or needs, (2) ask questions about the criteria and constraints of the devices or solutions, (3) generate and communicate ideas for possible devices or solutions, (4) build and test devices or solutions, (5) determine if the devices or solutions solved the problem, and (6) communicate the results.

***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" (p84). *Weather patterns occur day to day and by seasons.*

2. Cause and Effect: The National Research Council (2012) states "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).prompt questions about relationships and the factors that influence them" (p. 84). *Weather patterns and changes are affected by seasons. These patterns and changes in weather affect plants and animals.*

7. Stability and Change**:** The National Research Council (2012) states " 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" (p84). *Weather conditions change in predictable patterns as the seasons change. These changes cause animals and plants to respond with predictable patterns.*

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

Prior Knowledge
● N/A
Subsequent Knowledge
● 1.E.3 Earth & Light ● 2.E.2, 4.E.2, 6.E.2 Weather ● 4.E.3, 8.E.4 Light ● 8.E.4, 8.E.5 Earth ● H.E.4, & H.E.5 Seasonal and Daily patterns

Possible Instructional Strategies/Lessons

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

- K.E.3A.1 What is it like Outside Today? Students will collect local weather data including precipitation, wind, temperature, and cloud cover on a daily basis. The class can use the data to construct graphs and charts on a monthly basis. Students will measure temperatures. This resource can be found at http://lessonplanspage.com/sciencemathmeasuringtempseasonsk1-htm/

- K.E.3A.2 Four Season Booklet Students complete models to develop their understanding of seasonal weather patterns and changes. Students will create a booklet about the four seasons. This resource can be found at http://lessonplanspage.com/lascienceartseasonsbookideak1-htm/

  Students create a model (diorama, poster or mobile) to demonstrate the weather they would expect during a given season.

- K.E.3A.3 What would you wear? (See appendices)Students will complete a diagram that shows what they would wear during various weather conditions and/or seasons.

  Trees through the Seasons (See appendices) Students will complete a diagram that shows how trees appear in different seasons.

- K.E.3A.1- K.E.3A.3 The Four Seasons: Daily and Seasonal Changes Students participate in various activities that deal with the four seasons and the changes that occur during them. Some activities also address the reaction of plants and animals to seasonal changes. This site does offer cds, but the activities can be used without them. This resource can be found at https://rover.edonline.sk.ca/system/guides/four_seasons.pdf

- K.E.3A.3 What Changes When the Seasons Change? Class will use prior knowledge and resources to identify and describe how animals respond to seasonal changes. This site is geared toward 2nd grade, but the activity can be modified to be used with Kindergarten students. This resource can be found at: http://www.doe.virginia.gov/testing/sol/standards_docs/science/2010/lesson_plans/grade2/earth_patterns_cycles_changes/sess_2-7a.pdf

- K.E.3A.4 Identify problems caused by weather and design a solution! Students will identify problems caused by heat, cold, rain, and wind and design solutions for the problems such as: a playground designed to keep children cool in the summer, equipment to keep children warm while playing in the snow, ways to prevent their neighborhood from flooding, a wind resistant house, etc.

Resources

- "Weather" or Not, Seasons Change This resource provides lesson ideas for weather patterns throughout the four seasons. This resource can be found at: http://www.coreknowledge.org/mimik/mimik_uploads/lesson_plans/152/Weather%20or%20Not%20Seasons%20Change.pdf

- Can Teach Songs & Poems This resource provides songs and poems that teach about weather. This resource can be found at: http://www.canteach.ca/elementary/songspoems17.html

- Cloud Observation Activity This resource provides an idea for an observational activity with clouds. This resource can be found at: http://www.education.com/activity/article/filming-clouds-window/

- Animals in Winter This resource provides information about how animals react to winter weather conditions. This resource can be found at: http://www.sciencemadesimple.com/animals.html

- Exploring Weather Patterns This resource provides lesson ideas where students will collect and analyze data to observe weather patterns. This resource can be found at: http://rpsec.usca.edu/workshops/SISSI/LessonPlans/Weather/Weather_LessonPlan.pdf

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)

- K.E.3A.1 Ask students to describe the weather on a given day, including precipitation, wind, temperature, and cloud cover.

- K.E.3A.1 Provide students with a week's worth of data about the weather and have the students represent the weather using a graph or chart.

- K.E.3A.2 Provide students with images and a description of the weather and have them identify the season and explain their reasoning.
- K.E.3A.3 Have students draw or create a collage of a season that shows how animals and plants behave during that time of year.
- K.E.3A.3 Provide students with images and a description of what is occurring with plants and animals during that time period, Ask students to identify the season and explain their reasoning.
- K.E.3A.4 Have students design a lunch box that will keep their lunch warm in the winter and cool in the summer.

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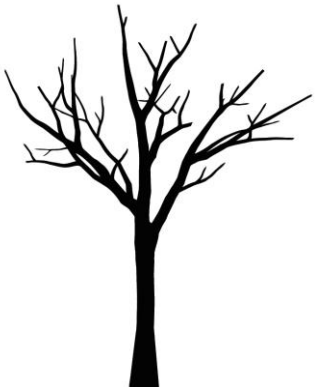
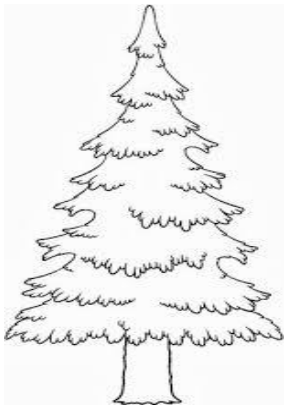
Kindergarten - Earth Science: Exploring Weather Patterns

Trees Through the Seasons

Materials:

- Paper Plates (2 per child) ¼ removed from one plate
- Paper Fasteners
- Images of trees (can include a deciduous and evergreen tree)





Procedures:

1. Teacher will need to glue on 4 sets of trees to the whole plate. One set of trees in each quadrant. Teacher will need to designate the season for each quadrant. On the plate that has the ¼ window write the question "What do trees look like in the……?"
2. Have students color the trees for each season.
3. Connect the two plates in the center using a paper fastener.

Discussion for activities:

Why did you color/draw the picture that way? Have students support explanations using oral language.

Standard
K.E.3 The student will demonstrate an understanding of daily and seasonal weather patterns

Conceptual Understanding
K.E.3A. Weather is a combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. Scientists measure weather conditions to describe and record the weather and to notice patterns over time. Plants and animals (including humans) respond to different weather conditions in different ways.

Performance Indicators
K.E.3A.3 *Obtain and communicate information* to support claims about how changes in seasons affect plants and animals.

Science and Engineering Practices
K.S.1A.8 Obtain and evaluate informational texts, observations, data collected, or discussions to (1) generate and answer questions about the natural world, (2) understand phenomena, (3) develop models, or (4) support explanations. Communicate observations and explanations using oral and written language.

Kindergarten - Earth Science: Exploring Weather Patterns

Trees Through the Seasons

Cross Cutting Concepts

1. Patterns: Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them. *Weather patterns occur day to day and by seasons.*

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Kindergarten - Earth Science: Exploring Weather Patterns

What Would you Wear?

Materials:

- Worksheet
- Colored pencils or crayons

Procedures:

1. Students will identify the appropriate clothing to wear for four major types of weather. They will draw a picture of themselves dressed appropriately for the weather. Students should be asked to provide explanations for their choices.

Sunny	**Rainy**
Snowy	**Windy**

Kindergarten - Earth Science: Exploring Weather Patterns

What Would you Wear?

Procedures

2. Students will identify the appropriate clothing to wear for four seasons. They will draw a picture of themselves dressed appropriately for the weather that occurs during that time of year. Students should be asked to provide explanations for their choices.

Winter	Spring
Summer	**Fall**

Standard
K.E.3 The student will demonstrate an understanding of daily and seasonal weather patterns

Conceptual Understanding
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Kindergarten - Earth Science: Exploring Weather Patterns

What Would you Wear?

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