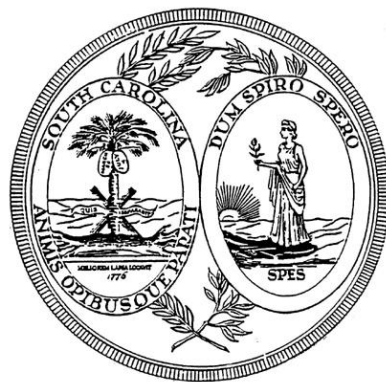


South Carolina Academic Standards and Performance Indicators for Science 2014



Instructional Unit Resource

3rd Grade

South Carolina Academic Standards and Performance Indicators for Science 2014

Third Grade Science Instructional Unit Resource

As support for implementing the *South Carolina Academic Standards and Performance Indicators for Science 2014*, the standards for Third 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 3 Overview of Units

Unit 1	Unit 2		Unit 3		Unit 4	
PHYSICAL SCIENCE: PROPERTIES AND CHANGES IN MATTER	PHYSICAL SCIENCE: ENERGY TRANSFER--ELECTRICITY AND MAGNETISM		EARTH SCIENCE: EARTH'S MATERIALS AND PROCESSES		LIFE SCIENCE: ENVIRONMENTS AND HABITATS	
Standard	Standard		Standard		Standard	
3.P.2	3.P.3		3.E.4		3.L.5	
Conceptual Understanding	Conceptual Understanding		Conceptual Understanding		Conceptual Understanding	
3.P.2A	3.P.3A	3.P.3B	3.E.4A	3.E.4B	3.L.5A	3.L.5B
Performance Indicators	Performance Indicators		Performance Indicators		Performance Indicators	
3.P.2A.1 3.P.2A.2 3.P.2A.3 3.P.2A.4 3.P.2A.5	3.P.3A.1 3.P.3A.2 3.P.3A.3	3.P.3B.1 3.P.3B.2	3.E.4A.1 3.E.4A.2 3.E.4A.3	3.E.4B.1 3.E.4B.2 3.E.4B.3 3.E.4B.4	3.L.5A.1 3.L.5A.2	3.L.5B.1 3.L.5B.2 3.L.5B.3
*Science and Engineering Practices	*Science and Engineering Practices		*Science and Engineering Practices		*Science and Engineering Practices	
S.1.A.3 S.1.A.4 S.1.A.6 S.1.A.8 S.1.B.1	S.1.A.2 S.1.A.3 S.1.A.4 S.1.A.8		S.1.A.2 S.1.A.4 S.1.A.8	S.1.A.1 S.1.A.2 S.1.A.3 S.1.A.8 S.1.B.1	S.1.A.4 S.1.A.2	S.1.A.8 S.1.A.2 S.1.A.7
*Crosscutting Concepts	*Crosscutting Concepts		*Crosscutting Concepts		*Crosscutting Concepts	
1, 2, 3, 5, 6, 7	2, 4, 5, 6		1, 2, 6		1, 2, 3, 4, 5, 6	

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

Unit Title
Earth Science: Earth's Materials and Processes
Standard
http://ed.sc.gov/scdoe/assets/file/agency/ccr/Standards-Learning/documents/South_Carolina_Academic_Standards_and_Performance_Indicators_for_Science_2014.pdf
3.E.4 The student will demonstrate an understanding of the composition of Earth and the processes that shape features of Earth's surface.

Conceptual Understanding					
3.E.4A Earth is made of materials (including rocks, minerals, soil, and water) that have distinct properties. These materials provide resources for human activities.					
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.					
Classify	Clay	Cleavage	Fossil fuels	Fuels	Glaciers
Grains	Hardness	Humus	Igneous	Lakes	Loam
Luster	Metamorphic	Mineral	Nonrenewable resource	Oceans	Ponds
Property	Renewable resource	Rivers	Sand	Seas	Silt
Streak	Streams	Texture	Topsoil		
Performance Indicators					
Text highlighted below in <i>orange</i> and <i>italicized/underlined</i> shows connections to SEP's.					
3.E.4A.1 <i>Analyze and interpret data</i> from observations and measurements to describe and compare different Earth materials (including rocks, minerals, and soil) and classify each type of material based on its distinct physical properties.					
3.E.4A.2 <i>Develop and use models</i> to describe and classify the pattern distribution of land and water features on Earth.					
3.E.4A.3 <i>Obtain and communicate information</i> to exemplify how humans obtain, use, and protect renewable and nonrenewable Earth resources.					

*Science and Engineering Practices

Support for the guidance, overviews of grade level 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.

3.S.1A.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.

3.S.1A.4 Analyze and interpret data from observations, measurements, or investigations to understand patterns and meanings.

3.S.1A.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 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 that “Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them” (p. 84). *Observable characteristics and patterns can help students sort earth materials into groups.*

2. **Cause and effect: Mechanism and explanation:** The National Research Council 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). *Weathering, erosion, and deposition cause changes to the Earth's surface.*

6. **Structure and function:** The National Research Council (2012) states “The way in which an object or living thing is shaped and its substructure determine many of its properties and functions” (p. 84). *Weathering, erosion, and deposition cause changes to the Earth that shape materials found on Earth's surface.*

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

Prior Knowledge
• 1.E.4 Natural Resources
Subsequent Knowledge
• 5.E.3, 8.E.5 Land features • 5.E.3, H.E.6 Water features • 5.E.3, 8.E.5, H.E.3 Renewable and nonrenewable resources • 8.E.5, H.E.3 Earth material

Possible Instructional Strategies/Lessons
Strategies and lessons that will enable students to master the standard and/or indicator.
• 3.E.4A.1 - o <u>Exploring Earth's Resources</u> Students observe and measure different earth materials including rocks, minerals, fossil fuels, and sediments. They describe and classify each type of material based on its physical properties and they learn how earth resources form. Students also learn that we are dependent on earth's resources for everything we have. This resource can be found at http://rpsec.usca.edu/workshops/SISSI/SISSI3-5AikenJune2015/lessons/G3EarthResourcesPlanSISSI.pdf - o <u>Rocks and Minerals Webquest</u> Students discover the purpose and value of earth materials through collaboration, investigations, and technology. This resource can be found at http://zunal.com/webquest.php?w=13839 • 3.E.4A.2 <u>Landforms and Water</u> Provides students with the experience of creating models of landforms and bodies of water. This resource can be found at https://pmm.nasa.gov/education/sites/default/files/lesson_plan_files/Models%20of%20Land%20and%20Water%20TG.pdf • 3.E.4A3 <u>Energy Sources</u> Website with activities of how humans obtain, use, and protect Earth's renewable and nonrenewable resources. This resource can be found at http://www.enlightensc.org/lesson-plan/3rd-grade/
Resources
• <u>Study Jams by Scholastic</u> This is an interactive site with quizzes, songs and slideshows about over 200 subjects. This resource can be found at http://studyjams.scholastic.com/studyjams/jams/science/index.htm?topic_id=rml • <u>3 Types of Rocks Rap</u> A catchy tune with lyrics to help student remember the types of rocks. This resource can be found at https://www.youtube.com/watch?v=EQs5TaG33CI

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)

- 3.E.4A.1
 - Rock Collection: Students collect a minimum of 5 different types of rock samples and classify each using its distinct physical properties.
 - Soil Collection: Students collect soil samples from around the school. Describe and compare the samples based on properties.
 - While studying different types of soil, Alex notices different particle sizes. He is comparing clay, loam, sand, and silt. Which soil will Alex find to be made of the smallest particles?
 - Explain two ways you can tell a sample is a mineral or rock.
- 3.E.4A.2
 - Land and Water Study: Each student group makes observations about the distribution of water and land on Earth. Answer the following question and defend your reasoning. Do you think it would be more beneficial to have more sustainable land or freshwater on earth?
- 3.E.4A.3
 - Earth Resources Brochure: students create a brochure to communicate information about how humans obtain, use and protect renewable and nonrenewable resources.
 - Community Plan: Create a plan to share with your community to help them understand and want to use less natural resources.
 - List three ways people directly impact the environment.

Unit Title

Earth Science: Earth's Materials and Processes

Standard

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

3.E.4 The student will demonstrate an understanding of the composition of Earth and the processes that shape features of Earth's surface.

Conceptual Understanding

3.E.4B Earth's surface has changed over time by natural processes and by human activities. Humans can take steps to reduce the impact of these changes.

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.

Canyons	Deposition	Earthquakes	Erosion	Floods	Human activity
Islands	Landform	Landslides	Mountains	Natural event	Plains
Valleys	Volcanic eruption	Volcanoes	Weathering		

Performance Indicators

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

3.E.4B.1 Develop and use models to describe the characteristics of Earth's continental landforms and classify landforms as volcanoes, mountains, valleys, canyons, plains, and islands.

3.E.4B.2 Plan and conduct scientific investigations to determine how natural processes (including weathering, erosion, and gravity) shape Earth's surface.

3.E.4B.3 Obtain and communicate information to explain how natural events (such as fires, landslides, earthquakes, volcanic eruptions, or floods) and human activities (such as farming, mining, or building) impact the environment.

3.E.4B.4 Define problems caused by a natural event or human activity and design devices or solutions to reduce the impact on the environment.

*Science and Engineering Practices

Support for the guidance, overviews of grade level 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.

3.S.1A.1 Ask questions that can be (1) answered using scientific investigations or (2) used to refine models, explanations, or designs.

3.S.1A.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.

3.S.1A.3 Plan and conduct scientific investigations to answer questions, test predictions and develop explanations: (1) formulate scientific questions and predict possible outcomes, (2) identify materials, procedures, and variables, (3) select and use appropriate tools or instruments to collect qualitative and quantitative data, and (4) record and represent data in an appropriate form. Use appropriate safety procedures.

3.S.1A.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 explanations, claims, or designs. Communicate observations and explanations using the conventions and expectations of oral and written language.

3.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 refine the design if needed, 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 that “Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them” (p. 84). [*Recognize patterns in natural events and human activities that influence the availability of natural resources and shape the characteristics of land/water features on Earth.*](#)

2. **Cause and effect: Mechanism and explanation:** The National Research Council 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). [*Natural events cause changes to land and water features on Earth.*](#)

6. **Structure and function:** The National Research Council (2012) states “The way in which an object or living thing is shaped and its substructure determine many of its properties and functions” (p. 84). [*Weathering, erosion, and deposition, as well as human activity, cause changes to the Earth that shape materials found on Earth's surface.*](#)

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

Prior Knowledge
• N/A
Subsequent Knowledge
• 4.E.3, 8.E.4 Gravity • 5.E.3, 8.E.5, H.E.3 Landforms • 5.E.3, 8.E.5, H.E.3 Weathering and erosion • 5.E.3, 8.E.6, H.E.5 Natural events • 5.E.3, H.E.3, H.E.5 Human activities
Possible Instructional Strategies/Lessons
Strategies and lessons that will enable students to master the standard and/or indicator. • 3.E.4B.1 - o <u>Models of Landforms and Bodies of Water</u> Provides students with the experience of creating models of landforms and bodies of water. This resource can be found at: https://pmm.nasa.gov/education/lesson-plans/models-landforms-and-bodies-water • 3.E.4B.2 - o <u>The Earth is a Changin'</u> Students will use their knowledge of erosion to create posters showcasing their designs to protect natural features of earth. This resource can be found at www.teachengineering.org/lessons/view/cub_earth_lesson5 - o <u>Face of the Earth</u> Students will discover the physical processes that shape the Earth's surface. This resource can be found at http://www.edu.pe.ca/southernkings/face.htm - o <u>The Power of Rain</u> Students will explore the power of rain on soil and the Earth's surface. http://www.kidsdiscover.com/teacherresources/erosion-ever-changing-earth/ - o <u>Weathering and Erosion</u> Students will discover the effects and processes that may occur with each type of weathering and erosion. This resource may be found at geology.com http://209.7.198.36/geologyonline/lessons/6.3/lesson.pdf • 3.E.4B.3 - o <u>Glaciers, Water and Wind, Oh My!</u> Students record observations and discuss the impact of erosion on Earth's surface. This resource

can be found at: https://www.teachengineering.org/activities/view/cub_earth_lesson5_activity1

- 3.E.4B.4
 - Lesson: Shaking It Up with Earthquake Engineering Students design and create structures to withstand earthquakes. This resource can be found at: <http://rpsec.usca.edu/Workshops/SISSI/SISSI3-5AikenAugust2015/lessons/Gr3EngineeringEarthquakesSISSI-LessonPlan.pdf>
 - Earth's Resources Website with activities of how humans obtain, use, and protect Earth's renewable and nonrenewable resources. This resource can be found at <http://www.enlightensc.org/lesson-plan/3rd-grade/>

Resources

- 3.E.4B.1
 - Scholastic Study Jams video clips on Landforms, fossils, soils, rocks, and minerals. This resource can be found at <http://studyjams.scholastic.com/studyjams/jams/science/index.htm>
- 3.E.4B.2
 - Class Orbit is a free website with short tutorial videos that allow students to interact with the unit vocabulary. This resource can be found at <http://classorbit.com/trending?msg=smi>
- 3.E.4B.3 and 3.E.4B.4
 - A series of lessons, featuring community activities that encourage students to help protect their communities from natural hazards. This resource can be found at http://www.mona.uwi.edu/cardin/virtual_library/docs/1248/1248.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)

- 3.E.4B.1 Create a book that describes the characteristics of each of the following landforms: volcanoes, mountains, valleys, canyons, plains, and islands.
- 3.E.4B.2
 - Explain the difference between weathering and erosion and how do each shape the earth's landscape.

- Which process is most responsible for the formation of the Grand Canyon?
- 3.E.4B.3
 - Choose a natural event (fires, landslides, earthquakes, volcanic eruptions, or floods) and explain with evidence how this event impacts the environment.
 - In a brochure format, explain with evidence how human activities (such as farming, mining, or building) impact the environment.
- 3.E.4B.4 Snowglobe Think of the big idea of the concept/vocabulary that was taught, and create a nonlinguistic representation/image/sketch in a snow globe – your “Snow Globe Story.” Students can discuss the “why” behind their image orally or through a written response (King, 2011).

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