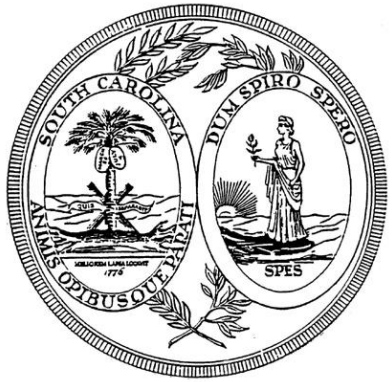
South Carolina Academic Standards and Performance Indicators for Science 2014



Instructional Unit Resource

1st Grade

South Carolina Academic Standards and Performance Indicators for Science 2014
First Grade Science Instructional Unit Resource

As support for implementing the *South Carolina Academic Standards and Performance Indicators for Science 2014*, the standards for First 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 1 Overview of Units

Unit 1	Unit 2	Unit 3		Unit 4	
PHYSICAL SCIENCE: EXPLORING LIGHT AND SHADOWS	EARTH SCIENCE: EXPLORING SUN AND MOON	EARTH SCIENCE: EARTH'S NATURAL RESOURCES		LIFE SCIENCE: PLANTS AND THEIR ENVIRONMENTS	
Standard	**Standard**	**Standard**		**Standard**	
1.P.2	1.E.3	1.E.4		1.L.5	
Conceptual Understanding	**Conceptual Understanding**	**Conceptual Understanding**		**Conceptual Understanding**	
1.P.2A	1.E.3A	1.E.4A	1.E.4B	1.L.5A	1.L.5B
Performance Indicators	**Performance Indicators**	**Performance Indicators**		**Performance Indicators**	
1.P.2A.1 1.P.2A.2 1.P.2A.3 1.P.2A.4	1.E.3A.1 1.E.3A.2 1.E.3A.3 1.E.3A.4 1.E.3A.5	1.E.4A.1 1.E.4A.2 1.E.4A.3	1.E.4B.1 1.E.4B.2	1.L.5A.1 1.L.5A.2	1.L.5B.1 1.L.5B.2 1.L.5B.3
***Science and Engineering Practices**	***Science and Engineering Practices**	***Science and Engineering Practices**		***Science and Engineering Practices**	
1.S.1A.2 1.S.1A.3 1.S.1A.4 1.S.1A.8	1.S.1A.2 1.S.1A.3 1.S.1A.4 1.S.1A.8 1.S.1B.1	1.S.1A.2 1.S.1A.3 1.S.1A.4 1.S.1A.8		1.S.1A.2 1.S.1A.3 1.S.1A.4 1.S.1A.6 1.S.1A.8	
***Crosscutting Concepts**	***Crosscutting Concepts**	***Crosscutting Concepts**		***Crosscutting Concepts**	
1, 2, 7	1, 2, 7	1, 2, 5, 7		1, 2,6, 7	

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

Unit Title
Physical Science: Exploring Light and Shadows
Standard http://ed.sc.gov/scdoe/assets/file/agency/ccr/Standards-Learning/documents/South_Carolina_Academic_Standards_and_Performance_Indicators_for_Science_2014.pdf
1.P.2: The student will demonstrate an understanding of the properties of light and how shadows are formed.

Conceptual Understanding
1.P.2A. Objects can only be seen when light shines on them. Some materials allow light to pass through them; others allow only some light to pass through; and some do not allow any light to pass through and will create a shadow of the object. Technology such as mirrors can change the direction of a beam of light.
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.**

Visible light	Light source	Reflect	Mirror	Redirect
Reversal	Magnify	Reduce	Shadow	

Performance Indicators **Text highlighted below in *orange* and *italicized/underlined* shows connections to SEP's**
1.P.2A.1 Obtain and communicate information to describe how light is required to make objects visible.
1.P.2A.2 Analyze and interpret data from observations to compare how light behaves when it shines on different materials.
1.P.2A.3 Conduct structured investigations to answer questions about how shadows change when the position of the light source changes.
1.P.2A.4 Develop and use models to describe what happens when light shines on mirrors based on observations and data collected.
***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.

1.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.

1.S.1A.3 With teacher guidance, conduct structured investigations to answer scientific questions, test predictions and develop explanations: (1) predict possible outcomes, (2) identify materials and follow procedures, (3) 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.

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

1.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 clearly through 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). *There are patterns in shadows as the position of the light source changes.*

2. Cause and effect Mechanism and explanation: 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). *When light strikes a shiny object, it is reflected.*

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). *Light behaves differently depending on the type of material it strikes.*

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

Prior Knowledge
● N/A
Subsequent Knowledge
● 4.P.4A.3 – Visibility of object related to light

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

- In the Dark (pages 22-26) This activity allows students to describe how light is required to make objects visible. This resource can be found at: http://www.alvordschools.org/cms/lib8/CA01900929/Centricity/Domain/2616/1st%20Grade%20Teachers%20Guide%20Complete.pdf

- Camera Lense Magic (pages 27-34) This activity allows students to compare how light behaves when it shines on different materials. This resource can be found at: http://www.alvordschools.org/cms/lib8/CA01900929/Centricity/Domain/2616/1st%20Grade%20Teachers%20Guide%20Complete.pdf

- Making Shadows (pages 35-38) This activity allows students to answer questions about how shadows change when the position of the light source changes. This resource can be found at: http://www.alvordschools.org/cms/lib8/CA01900929/Centricity/Domain/2616/1st%20Grade%20Teachers%20Guide%20Complete.pdf

- Reflections (pages 39-40) This activity allows students to describe what happens when light shines on mirrors based on observations and data collected. This resource can be found at: http://www.alvordschools.org/cms/lib8/CA01900929/Centricity/Domain/2616/1st%20Grade%20Teachers%20Guide%20Complete.pdf

- Lightness and Darkness in Space (Activity 1) This activity allows students to describe how light is required to make objects visible. This resource can be found at: http://www.learnnc.org/lp/editions/earth-sun/6624

- Sun and Moon This activity allows students to describe how light is required to make objects visible and answer questions about how shadows change when the position of the light source changes. This resource can be found at: http://rpsec.usca.edu/workshops/sissi/sissi2014-15/sunmoon/sunmoonlessonplan-sissiblank.pdf

- Exploring the Moon This activity allows students to describe how light is required to make objects visible. This resource can be found at: http://rpsec.usca.edu/Workshops/SISSI/LessonPlans/SunandMoon/MoonLessonPlan.pdf

- Sun and Shadows These activities allow students to discover how the Sun appears to move, how shadows change over time, and how the angle at which light shines changes the brightness and spread of the light. This resource can be found at: SI/LessonPlans/SunandMoon/SunShadowsLessonPlan.pdfhttp://rpsec.usca.edu/Workshops/SIS

Resources

- Show Me Science-The Science of Light This website allows students to explore light and shadows. This resource can be found at: http://www.livebinders.com/play/play/1976001

- Modeling Shadows This activity allows students to demonstrate how shadows are made. This resource can be found at: http://sciencenetlinks.com/lessons/sky-3-modeling-shadows/

- Sunshine and Shadows These activities allow students to investigate how light and shadows are related. This resource can be found at: http://www.mrreguinho.com/home/science/sunshine-and-shadows

- The Role of Light to Sight This website will give teachers the background knowledge to teach the light standards. This resource can be found at: http://www.physicsclassroom.com/class/refln/Lesson-1/The-Role-of-Light-to-Sight

- A Scientific Investigation on Light This activity allows students to describe how light is required to make objects visible. This resource can be found at: https://www.teachingchannel.org/videos/science-lesson-on-light

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)

- As a light source is shined on a ball, students record by coloring, the light and shadow as the flashlight is moved in various positions. Students the construct simple sentences describing the data they collected.

- Only the Shadow Knows This assessment will allow students to show how shadows change when the position of the light source changes. This assessment can be found at: http://files.havefunteaching.com/free-worksheets/science/shadows-worksheet.pdf

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