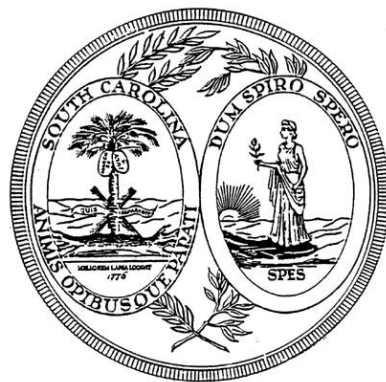


South Carolina Academic Standards and Performance Indicators for Science 2014



Instructional Unit Resource
Kindergarten

South Carolina Academic Standards and Performance Indicators for Science 2014

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.2 K.S.1A.3 K.S.1A.4 K.S.1A.7 K.S.1B.1
*Crosscutting Concepts	*Crosscutting Concepts	*Crosscutting Concepts
1,2,6	1,2,7	1,2,4,7

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

Unit Title
Physical Science: Exploring Properties of Objects and Materials
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.P.4A The student will demonstrate an understanding of the observable properties of matter.

Conceptual Understanding																														
K.P.4 Objects can be described and classified by their observable properties, by their uses, and by whether they occur naturally or are manufactured (human-made). Different properties of objects are suited for different purposes.																														
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.																														
<table border="0"> <tr> <td>Attraction</td> <td>Cloth</td> <td>Color</td> <td>Flexibility</td> <td>Floating</td> <td>Hard</td> </tr> <tr> <td>Heavier</td> <td>Human-made</td> <td>Lighter</td> <td>Magnetic</td> <td>Metal</td> <td>Natural</td> </tr> <tr> <td>Plastic</td> <td>Properties</td> <td>Qualitative properties</td> <td>Rough</td> <td>Scientific observations</td> <td>Shape</td> </tr> <tr> <td>Sinking</td> <td>Size</td> <td>Smooth</td> <td>Soft</td> <td>Texture</td> <td>Weight</td> </tr> <tr> <td>Wood</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Attraction	Cloth	Color	Flexibility	Floating	Hard	Heavier	Human-made	Lighter	Magnetic	Metal	Natural	Plastic	Properties	Qualitative properties	Rough	Scientific observations	Shape	Sinking	Size	Smooth	Soft	Texture	Weight	Wood					
Attraction	Cloth	Color	Flexibility	Floating	Hard																									
Heavier	Human-made	Lighter	Magnetic	Metal	Natural																									
Plastic	Properties	Qualitative properties	Rough	Scientific observations	Shape																									
Sinking	Size	Smooth	Soft	Texture	Weight																									
Wood																														

Performance Indicators
Text highlighted below in <i>orange</i> and <i>italicized/underlined</i> shows connections to SEP's.
K.P.4A.1 <i>Analyze and interpret data</i> compare the qualitative properties of objects (such as size, shape, color, texture, weight, flexibility, attraction to magnets, or ability to sink or float) and classify objects based on similar properties.
K.P.4A.2 <i>Develop and use models</i> to describe and compare the properties of different materials (including wood, plastic, metal, cloth, and paper) and classify materials by their observable properties, by their uses, and by whether they are natural or human-made.
K.P.4A.3 <i>Conduct structured investigations</i> to answer questions about which materials have the properties that are best suited to solve a problem or need.

*Science and Engineering Practices

Support for the guidance, overviews of grade level progressions, and explicit details of each SEP can be 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.4 Analyze and interpret data from observations, measurements, or investigations to understand patterns and meanings

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.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 make qualitative observations and take nonstandard measurements, and (4) record and represent data in an appropriate form. Use appropriate safety procedures.

K.S.1A.7 Construct scientific arguments to support explanations using evidence from observations or data collected

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 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 that develop as materials are sorted by their properties.*

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). *The properties of a material affect the classification criteria. The classification criteria will vary with different contexts and those criteria should be explained for each new context.*

4. **Systems and systems models:** The National Research Council (2012) states that “Defining the system under study—specifying its boundaries and making explicit a model of that system—provides tools for understanding and testing ideas that are applicable throughout science and engineering” (p. 84). *Rules for classification may be applied to all materials.*

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). [Properties of objects may be changed.](#)

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

Prior Knowledge

- N/A

Subsequent Knowledge

- 2.P.3 Solid, liquid, gas
- 3.P.2 Properties of matter; solid, liquid, gas
- 5.P.2 Properties of matter

Possible Instructional Strategies/Lessons

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

- K.P.4A.1 Qualitative Properties:
 - Discovering Properties with the Five Senses: This lesson explores the five senses and how they are used to discover properties of objects: http://www.digitalwish.com/dw/digitalwish/view_lesson_plans?id=4342
 - Sink or Float?: This lesson starts with suggested literature and allows the students to test predictions and classify objects according to whether or not they sink or float. This resource can be found at: <http://sciencenetlinks.com/lessons/sink-or-float/>
 - Properties of Matter: This unit of study contains six lessons that address the qualitative properties of objects including color, texture, shape, weight, and size. This unit can be found at: <https://www.lernerbooks.com/SiteCollectionDocuments/TeachingGuides/9780822553489.pdf>
 - Kindergarten Objects and Materials: This unit provides eight lessons that explore observable properties of materials in the students’ natural environment: <https://tammyflaman.files.wordpress.com/2010/12/k-objects-and-materials-unit.pdf>
 - Weight: This blog provides multiple activities in which students can explore the weight of items, including making their own balance scale. The blog also has examples of interactive note booking activities for weight. This blog can be found at: <http://www.kindergartenkindergarten.com/2012/07/math-measurement-weight.html>

- Flexibility: The concept on this website can be used to teach students about the flexibility of a Tootsie Roll. The frozen Tootsie Roll does not bend, but the warmed up Tootsie Roll does bend. This idea can be found at: <http://lessonplanspage.com/tootsie-roll-flexibility-lesson/>
- Attraction to Magnets: This unit provides five days of activities that address magnetic attraction, types of magnets, magnet strength, and poles. This resource can be found here: http://www.coreknowledge.org/mimik/mimik_uploads/lesson_plans/1140/K_TeachingMagnetsKindergarten.pdf
- K.P.4A.2 Classifying Materials:
 - Investigating Observable Properties of Materials: This unit provides multiple opportunities to create models such as t-charts, KLEW charts, a texture hand, texture chart, and a booklet. This resource can be found at: http://www.bsisd.esc18.net/documents/Lesson%20Ideas/LESSONS%20&%20RESOURCES/SCIENCE/1st%20Gr/Science_Grade_01_Unit_02_Exemplar_Lesson_01_Investigating_Observable_Properties_of_Materials.pdf
 - Classify Materials: This lesson asks students to label items around the classroom as natural or human-made. This resource can be found at: <http://elementaryscienceteachers.pbworks.com/f/Natural+and+man+made+Lesson+Plan.pdf>
 - What Are Things In My World Made Of?: This unit involves the creation of a class model of real-life items sorted into the materials they are made of. This resource can be found at: <https://inquiryproject.terc.edu/curriculum/curriculum3/materials/investigatison1/>
 - Describing Materials: This unit is for second grade, but lesson two requires the students to describe the properties of materials. Lesson three asks students to compare and contrast materials. This resource can be found at: <http://www.mccracken.kyschools.us/Downloads/2%20NGSS%20UNIT%20Matter.pdf>
- K.P.4A.3 Conduct structured investigations:
 - Float the Boat: Students are challenged to design a boat that will float using materials they select. The students should construct arguments to defend their boat creation. It can be differentiated to meet and assess multiple learning levels. This resource can be found at: [Lesson Title: Float the Boat Grade Level: Kindergarten Quarter: 3](#)
 - Exploring With Magnets: Students will predict, sort, test, and classify materials as being magnetic or non-magnetic. Students can defend their predictions based on what they know. This resource can be found at: http://rpsec.usca.edu/Workshops/SISSI/LessonPlans/Magnets/Magnets_LessonPlan.pdf

- Exploring Properties of Objects and Materials (Wood): Students will compare properties of different kinds of wood. This resource can be found at: http://rpsec.usca.edu/workshops/SISSI/LessonPlans/Wood_LessonPlan.pdf

Resources

- Classify Materials: This website can help develop prior knowledge about the types of materials. The students can sort items into wood, glass, rubber, or metal at: http://www.bbc.co.uk/schools/scienceclips/ages/6_7/grouping_materials.shtml
- Properties of Matter Games: This lesson lists games and videos that can be used during instruction. These can be found at: www.doe.in.gov/sites/default/files/ccr/kindergarten-properties-matter.docx
- Materials and their Properties: This website contains links to several online games and book recommendations: <http://www.firstschoolyears.com/science/materials/materials.htm>
- Natural or Man-Made?: This is an online, level K, book that tells about natural or man-made items: https://schools.smcps.org/gkes/images/Natural_or_Man-Made-.pdf
- Magnetic Attraction: This website has literacy connections that can be integrated with lessons about magnets. The suggested book and poem can be found at: <http://www.brighthubeducation.com/pre-k-and-k-lesson-plans/127723-two-day-magnet-lesson-plan-for-kindergarten/>
- Mr. Rogers' Sink: This website allows students to drag items to a sink to discover what sinks and floats. This site can be found at: <http://pbskids.org/rogers/sink.html>
- BrainPop Jr.: Sink or Float: Found at: <https://jr.brainpop.com/science/forces/sinkorfloat/>
- Literature Resources:
 - Properties of Matter at <http://www.teachingkidsbooks.com/3rd-4th-grade/properties-of-matter>
 - Science Book About Matter: Properties of Matter at <http://www.storyjumper.com/book/index/17818128/untitled#>
 - Favorite Children's Books for Teaching Science at <http://commoncore.dadeschools.net/docs/science/Elementary%20Science/PPSFavoriteBooksK-6.pdf>
 - NSTA's Outstanding Science Trade Books lists at <http://www.nsta.org/publications/ostb/>

- **YouTube Videos:**

- Science Video for Kids: Natural Resources of the Earth at <https://www.youtube.com/watch?v=Qw6uXh9yM54>
- Physical Science for Children All About the Properties of Matter at <https://www.youtube.com/watch?v=8ta4HygRCpk>
- How Can You Find a Magnet at <https://www.youtube.com/watch?v=QN6o5yMbKlc>
- Physical Science for Children All About Magnets at <https://www.youtube.com/watch?v=9FS-g9WyNfA>
- 3C Materials Song at <https://www.youtube.com/watch?v=xOKr462HLC0>
- Properties of Matter These series of “Crash Course Kids” videos defines matter and explores the various properties of matter. These videos can be found at: <https://www.youtube.com/watch?v=ELchwUIlWa8&list=PLhz12vamHOnaY7nvpgtQ0SIbuJdC4HA5O>

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)

- Observable Properties of Matter: This lesson provides students an opportunity to work in cooperative learning groups to sort the observable properties of matter. The lesson provides opportunities to collect formative data through a KWL chart and weight, texture, and temperature recording sheets. This lesson can be found at: <http://www.cpalms.org/Public/PreviewResourceLesson/Preview/46090>
- Sorting Matter: This lesson provides a sorting activity using the observable properties of matter. Assessment questions are also included in this lesson. The students should be able to defend their completed sorts using information learned. This lesson can be found at: [http://www.ccsoph.us/Downloads/\(7\)Sorting%20Matter%20Lesson.pdf](http://www.ccsoph.us/Downloads/(7)Sorting%20Matter%20Lesson.pdf)
- Describing the World Using the Five Senses: This unit provides many opportunities for pre- and post-assessment including a cumulative activity with rubric reminders. This lesson can be found at: <http://www.wheretomorrowbegins.org/climb/wp-content/uploads/2013/02/KP2-Science-Unit.pdf>
- Sort the Recyclable Materials: Students sort objects for recycling based on their properties and explain why each material goes with the appropriate category. Everyday objects or picture cards of objects may be used. The students should be able to defend their sorts. This lesson can be found at: https://www.lakeshorelearning.com/media/images/free_resources/teachers_corner/printables/recyclingGame.pdf
- Magnets Activities for Kids: These lessons provide many opportunities for students to demonstrate understandings about materials that are attracted to magnets and not attracted to magnets. These lessons and resources can be found at: <https://educators.brainpop.com/bp-jr-topic/magnets/>

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