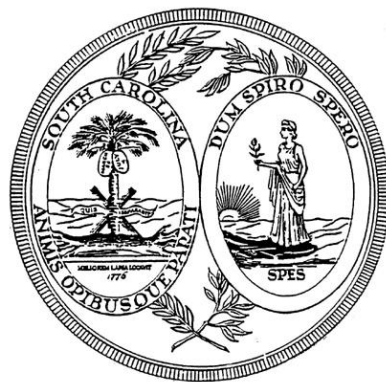


South Carolina Academic Standards and Performance Indicators for Science 2014



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	2, 3, 5, 6		1, 2, 4, 6, 7	

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

Unit Title
Life Science: Plants and their Environments
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.L.5 The student will demonstrate an understanding of how the structures of plants help them survive and grow in their environments.

Conceptual Understanding					
1.L.5A Plants have specific structures that help them survive, grow, and produce more plants. Plants have predictable characteristics at different stages of development.					
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.					
Adaptations	Attract	Development	Environment	Flowering	Flowers
Fruit	Germination	Growth	Leaves	Mature	Measurement
Nutrients	Observe	Pollen	Produce	Roots	Seedling
Seeds	Soil	Space	Sprout	Stem	Structures
Sunlight	Survive	Water			
Performance Indicators					
Text highlighted below in orange and italicized/underlined shows connections to SEP's.					
1.L.5A.1 <i>Obtain and communicate</i> information to construct explanations for how different plant structures (including roots, stems, leaves, flowers, fruits, and seeds) help plants survive, grow, and produce more plants.					
1.L.5A.2 <i>Construct explanations</i> of the stages of development of a flowering plant as it grows from a seed using observations and measurements.					
*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.

1.S.1A.6 Construct explanations of phenomena using (1) student-generated observations and measurements, (2) results of scientific investigations, or (3) data communicated in graphs, tables, or diagrams.

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 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). *Students will understand and develop models of the lifecycle of a plant and explain that the life cycle is a repeating pattern.*
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). *Students will explain how the structures of plants affect the survival, growth and reproduction of more plants.*
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). *Students will construct a model of a plant, including roots, stems, leaves, flowers, fruits, and seeds.*
6. **Structure and function:** The National Research Council (2012) states that “the way in which an object or living thing is shaped and its substructure determine many of its properties and functions” (p. 84). *Students will construct a model of a plant with different parts (including roots, stems, leaves, flowers, fruits, and seeds) and explain their functions.*

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

Prior Knowledge
• K.L.2A.2 - Plants need water and light • K.L.2A.6 - Basic knowledge of plants
Subsequent Knowledge
• 4.L.5B.2 - Structural adaptations of plants (roots, stems, leaves, flowers, fruit, seeds) • 6.L.5B.1 – Internal structures of plants transport food and water • 6L.5B.3 – Structural adaptations that plants use for defense, survival, and reproduction
Possible Instructional Strategies/Lessons
Strategies and lessons that will enable students to master the standard and/or indicator.
• 1.L.5A.1 ○ <u>Pondering Plants</u>: This unit helps students examine the jobs of roots, stems, and leaves in six different lessons. This resource can be found at http://www.lifelab.org/wp-content/uploads/2010/02/1stPonderingPlants2012.pdf. ○ <u>Fruit and Fruit Seed Exploration</u>: This lesson plan engages children by having them explore a variety of fruits and vegetables through the inquiry process. This resource can be found at https://bu.digication.com/rachelshapp/Sample_Lesson_Plan. ○ <u>How a Seed Works</u>: This lesson includes growing plants from seeds in order to observe how seeds work. This resource can be found at http://www.scholastic.com/teachers/lesson-plan/lets-grow-plants. ○ <u>External Plant Parts</u>: This unit contains several lessons about plants and animals. Unit one-lesson one (p. 5) and unit one-lesson three (p. 7) have the students explore the plant parts in plant reproduction and asks the students to match a plant to its “parent.” Unit three-lesson one (p. 14) requires students to be able to name the plant part and its job. This resource can be found at http://www.georgetowncollege.edu/ccrp/files/2015/12/ELL-Science-Unit-Grade-1.pdf. ○ <u>Plant Part Examination</u>: This lesson has students examine plant parts under a microscope in order to determine patterns observed in each part of the plant. This resource can be found at http://www.strscopes.com/PDF_Downloads/STR_Lesson_Plan_Plant_Parts.pdf.

- Parts of a Plant: This lesson reviews the parts of the plant through the creation of a plant model. The students will create a model of a plant using a variety of materials. This lesson can be found at <http://www.education.com/lesson-plan/parts-of-a-plant/>.
- Plant Structure and Function: This lesson provides several opportunities for the students to explore how the structure of plants relates to their functions. Specifically, students will explore how the seeds and fruits contribute to seed dispersal and the different ways seeds are dispersed. This resource can be found at http://scetv.pbslearningmedia.org/resource/tdc02.sci.life.stru.lp_plants/plant-structure-and-function/.
- Plants and Me: This lesson (see week two) contains an exploration of plant parts including a song and investigations for each of the three main parts (stem, leaves, and roots). This lesson can be found at <http://teachers.net/lessons/posts/4587.html>.
- Vary Your Veggies: This lesson looks at the plant parts for fruits and vegetables and provides an exercise for each part. This lesson can be found at <https://idph.iowa.gov/Portals/1/Files/INN/LP9%20K-1%20Vary%20Your%20Veggies%20Final%207.13.12.pdf>.
- Plant Parts and Functions: This lesson provides chants and explorations into all plant parts including the fruit and flower. This lesson can be found at http://www.doe.virginia.gov/testing/sol/standards_docs/science/2010/lesson_plans/grade1/life_processes/sess_1-4b.pdf.
- 1.L.5A.2
 - The Life Cycle of a Plant: In this lesson, students will be able to name and sketch the parts of a plant. Students will be able to name the three things that a plant needs to survive. This resource can be found at <http://www.education.com/lesson-plan/life-cycle-of-a-plant/>.
 - From Seed to Plant: Students will learn that different seeds are different shapes and sizes. Students will dissect, discover, and sort plant seeds. This lesson and resources can be found at <http://www.scholastic.com/teachers/lesson-plan/seed-plant>.
 - Germination of Seeds: Students will learn about the life cycle of a plant. Students will understand and learn how to set up a germination experiment and how to grow seeds they collect on their socks. This lesson and resources can be found at http://scetv.pbslearningmedia.org/resource/tdc02.sci.life.colt.lp_plantcycle/plant-life-cycles/.

Resources

- Nonfiction Texts:
 - *From Seed to Plant* by Gail Gibbons is a book that describes the life cycle of a plant from the time it is a seed until it is a plant.
 - *A Fruit is a Suitcase for Seeds* by Jean Richards is a book read on YouTube that talks about the importance of all seeds.
<https://www.youtube.com/watch?v=8kQIO1oFXFQ>
 - *Seeds* by Ken Robbins is a book that describes seeds in different sizes, shapes, and dispersal patterns.
 - *The Reason for a Flower: A Book About Flowers, Pollen, and Seeds (Explore!)* is a book by Ruth Heller that shares in a rhythmic style more about parts of a plant and its functions.
 - *Plant Plumbing: A Book About Roots and Stems* by Susan Blackaby is a book that shows how plants store food during the winter and carry water up to the leaves through roots and stems.
 - *Plants That Never Ever Bloom: A Book About Plants Without Flowers (Explore!)* by Ruth Heller is a nonfiction picture book that introduces plants that do not have flowers like mushrooms, seaweed, ferns, and more.
 - *How Plants Grow* by Dona Herweck Rice is a nonfiction book that describes the parts of the plant and how they will grow.
 - *Good Work: Plant Life* by Dona Herweck Rice is a nonfiction book that describes what a plant will need to live and grow.
 - *A Plant's Life Cycle! From Small Sprouts to Big Leaves* by Left Brain Kids is a nonfiction book that provides information on how a tiny seed becomes a tree.
 - *Plants! How They Change with the Seasons* by Left Brain Kids is a nonfiction book that discusses how plants can grow during different seasons of the year.
 - *How Does a Seed Grow?* by Sue Kim and Tilde is a nonfiction book that gives clues for the reader to discover what plants will grow from the different seeds.
- Fiction Texts:
 - *The Tiny Seed* by Eric Carle is a book that describes the life cycle of a flower beginning with a tiny seed.
 - *The Carrot Seed* by Ruth Krauss is a book that describes how one seed grows to become a carrot.
 - *If You Plant a Seed* by Kadir Nelson is a book about how planting and growing can also be about kindness.
 - *Lola Plants a Garden* by Anna McQuinn and Rosalind Beardshaw is a book about how one little girl learned about plants and decided to make her own garden.

- *Plant the Tiny Seed* by Christie Matheson is a book about how seeds grow. It is an interactive book that involves tapping, clapping, and waving to help the seeds grow.
- *Planting a Rainbow* by Lois Ehlert is a book about how to plant bulbs, seeds, and seedlings while nurturing their growth.
- *Henry Helps Plant a Garden* by Beth Bracken and Ailie Busby is a book about a little boy that helps tend to his family's garden.
- Videos:
 - This video gives students a visual example of the plant parts: <https://www.youtube.com/watch?v=CX2m2n2uDAE>.
 - This video gives students a visual example of the plant parts and its function: <https://www.youtube.com/watch?v=X6TLFZUC9gl>.
- Virtual Resources:
 - This website shows a drawing of a plant with the parts identified (lifecycle of a plant diagram): <http://www.parkfieldict.co.uk/infant/plants/lifecycle.html>.
 - This unit contains vocabulary planners specifically for ELL students, as well as literacy suggestions: <http://www.georgetowncollege.edu/ccrp/files/2015/12/ELL-Science-Unit-Grade-1.pdf>.
 - This website has literature suggestions, as well as links about plants: <http://emmapscience.weebly.com/plants.html>.
 - This website contains links to other resources about plants: <https://www.teachervision.com/plants/teacher-resources/6656.html>.
 - This guide contains information about plant needs and parts that can be shared on a white board: http://www.compton.k12.ca.us/pages/departments/Curriculum/PDF/1stGradeUnitBChp3_5.pdf.
 - This online book contains a wealth of information about plants and includes many resources, curriculum maps, and lessons. These lessons are geared toward gifted first and second grade students: <http://www2.fcps.edu/TerraCentreES/discoverygarden/docs/buddingbotanistsunit.pdf>.
 - This resource is a slide show explaining the parts of a plant: <http://www.slideshare.net/elemlms/plant-parts-12nd-grade>.
 - The Riverbanks Zoo has a field trip guide that can be used for ideas for classroom activities that explore plants: <http://www.riverbanks.org/assets/pdf/s04fttc-1st.pdf>.
 - This website contains a wealth of links to other lessons about plants: <http://beyondpenguins.ehe.osu.edu/issue/polar-plants/hands-on-lessons-and-activities-about-plants>.

- This website contains links to state flowers that can be used to view plants specific to South Carolina:
<http://www.wildflower.org/collections/>.
- This website contains videos and examples of how seeds are dispersed: <http://www.mbgnet.net/bioplants/seed.html>.
- BrainPOP Jr. can be accessed via public schools. The section on plants can be found at <https://jr.brainpop.com/science/plants/>.
- This website breaks each plant part down into more specific types. This information could be used for students who need more of a challenge: <http://www.backyardnature.net/botany.htm>.
- *The Great Plant Escape* is a website that contains several modules that require the students to solve cases about plants:
<http://extension.illinois.edu/gpe/case1/index.html>.
- This website contains several guiding activity sheets to show the plant parts and the parts of plants that we eat (fruit vs. vegetable):
<http://www.greatschools.org/gk/worksheets/plants-are-yummy/>.
- This resource can help with starting a school garden. There are also resources for labeling plant parts and other journal activities:
https://wasatchgardens.org/images/docs-pdfs/school/1st%20Grade%20Garden%20Curriculum_Part%202.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)

- 1.L5A.1
 - Let's Learn About Plants: This lesson gives several literature suggestions so the students can obtain and evaluate texts. The activity also asks students to become “plant hunters” and walk around the school to observe parts of plants. Once the students have obtained information from the texts and their observations, they draw a model of a plant and label the parts. This lesson can be used to assess the students’ abilities to evaluate texts, collect data, and record observations. This lesson can be found at <http://www.scholastic.com/teachers/lesson-plan/lets-learn-about-plants-0>.
 - What Plants Need: This unit plan provides many resources as well as pre-assessment and assessment activities. The assessment section (lesson 6) provides three tasks the students complete in order to explain their thinking about plant parts and their functions. This resource can be found at <http://www.ascd.org/publications/books/102294/chapters/What-Plants-Need@-A-Science-Unit-on-the-Functions-of-Plant-Parts.aspx>.

- o Plant Parts Checklist: This basic checklist can be used to assess students' models of plants. This checklist can be found under assessment activity one: <http://betterlesson.com/lesson/641200/demonstrating-our-knowledge-of-plants-assessment-activities>.
- 1.L5A.2
 - o Plants and How They Grow: Use a science notebook to record observations on how the plant is growing and changing. Students can sketch their plants, label parts, and note measurements on the data graph. These lessons and sheets can be found at <http://buggyandbuddy.com/gardening-kids-planting-seeds-free-printable/> and <http://theideacubby.blogspot.com/2012/11/plant-journals.html>.
 - o Plant Life Cycle Book: This unit plan guides students through the life cycle of a plant. The students create a book as they go through each lesson. The final book can be used as a formative assessment. This unit can be found at <http://www.myips.org/cms/lib8/IN01906626/Centricity/Domain/8123/2nd%20grade%20Unit%20Plant%20-%20The%20Life%20Cycle%20Of%20A%20Plant.pdf>.

Unit Title

Life Science: Plants and their Environments

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.L.5 The student will demonstrate an understanding of how the structures of plants help them survive and grow in their environments.

Conceptual Understanding

1.L.5B. Plants have basic needs that provide energy in order to grow and be healthy. Each plant has a specific environment where it can thrive. There are distinct environments in the world that support different types of plants. These environments can change slowly or quickly. Plants respond to these changes 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.

Adaptation	Air	Bark	Cacti	Changing	Characteristics
Conserve	Decay	Deciduous	Deserts	Different	Energy
Environment	Food	Forests	Grasslands	Grow	Healthy
Leaves	Light	Minerals	Needle	Nutrients	Plant
Rain	Roots	Soil	Space	Stems	Sunlight
Survive	Thrive	Water	Waxy coating		

Performance Indicators

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

1.L.5B.1 ***Conduct structured investigations*** to answer questions about what plants need to live and grow (including air, water, sunlight, minerals, and space).

1.L.5B.2 ***Develop and use models*** to compare how the different characteristics of plants help them survive in distinct environments (including deserts, forests, and grasslands).

1.L.5B.3 ***Analyze and interpret data*** from observations to describe how changes in the environment cause plants to respond in different ways (such as turning leaves toward the sun, leaves changing color, leaves wilting, or trees shedding leaves).

*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.

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.

***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). *The natural world can be observed through changing patterns in the environment (seasons, climate changes, severe weather effects). These factors influence how a plant adapts to these environmental 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). *Without basic needs, plants will not survive.*

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). *Plants require basic needs in order for the system (cycle) to continue.*

6. **Structure and function:** The National Research Council (2012) states that “The way in which an object or living thing is shaped and its substructure determine many of its properties and functions” (p. 84). *When removed from their distinct environments plants may not thrive.*

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). *Plants are an essential component of a stable environment.*

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

Prior Knowledge
• K.L.2A.2 - Plants need water and light • K.L.2A.6 - Basic knowledge of plants
Subsequent Knowledge
• 3.L.5A.1 - Environment supports a variety of organisms • 4.L.5A.2- Life cycle of plants • 4.L.5B.2 - Structural adaptations of plants (roots, stems, leaves, flowers, fruit, seeds) • 4.L.5B.2 - Structural adaptations that allow plants to survive • 6.L.5B.1 – Internal structures of plants transport food and water • 6.L.5B.2 – Photosynthesis, respiration, and transpiration meet the needs of plants • 6.L.5B.3 – Structural adaptations that plants use for defense, survival, and reproduction • 6.L.5B.4 – Changes in the environment affect growth and development of plants
Possible Instructional Strategies/Lessons
Strategies and lessons that will enable students to master the standard and/or indicator. • 1.L.5B.1 ○ <u>Growing Plant Simulation</u>: Using a virtual simulator, students attempt to make a plant grow to its full size by adding heat (light) and water. This resource can be found at http://www.sciencekids.co.nz/gamesactivities/plantsgrow.html. ○ <u>Do Plants Need Sunlight?</u>: This investigation provides a concrete example of what happens when plants do not receive sunlight. The introduction of <i>chlorophyll</i> as a vocabulary word can be replaced with <i>food</i> or <i>nutrients</i>. This resource can be found at http://www.reachoutmichigan.org/funexperiments/agesubject/lessons/sunlight.html. ○ <u>Pondering Plants Exploration</u>: This compilation of lesson plans helps students explore and learn how the parts of a plant help the plant receive its needs. This resource can be found at http://www.lifelab.org/wp-content/uploads/2010/02/1stPonderingPlants2012.pdf.

- 1.L.5B.2
 - Plant Adaptations Activities for Kids: BrainPop offers classroom and at-home activities for kids relating to plant adaptations. This resource can be found at <https://educators.brainpop.com/lesson-plan/plant-adaptations-activities-for-kids/>.
 - Adaptation: A Way of Life: These activities show how desert plants and animals are adapted to life in the desert and thrive with little moisture. This resource can be found at https://www.desertmuseum.org/center/edu/docs/k-2_TIP_adaptation.pdf.
 - Our Grasslands: Students will be introduced to the grassland environment and the plants and animals that live there. This resource can be found at http://ims.ode.state.oh.us/ODE/IMS/Lessons/Web_Content/CSC_LP_S02_BA_L02_I05_01.pdf.
 - Rainforest Adaptations- Thriving in a Challenging Ecosystem: Students develop an understanding of the rainforest ecosystem, describe the challenges faced by plants in the rainforest, and explain how adaptations help rainforest plants survive. This resource can be found at <http://www.edenproject.com/sites/default/files/documents/Rainforest%20Adaptations%20lesson%20plan.pdf>.
- 1.L.5B.3
 - Plants and the Environment: Students will learn about several plants and how they grow and respond to three conditions: gravity, drought, and light. This resource can be found at http://www.crsce.org/lessonplans/2_PlantsandEnvironment_1011.pdf.
 - Fall Slumbers: Students observe changes in a selected tree leaf during the fall. Special modifications are included for the primary classroom. Assessment options are also included. This resource can be found at <http://www.cas.miamioh.edu/scienceforohio/Fall%20Slumbers/L.html>.
 - Why Do Plants Wilt?: Students build a model garden and test plants as they wilt in the sun. This resource requires a free login and can be found at <http://www.education.com/pdf/why-do-plants-wilt/>.

Resources

- 1.L.5B.1
 - The Tiny Seed by Eric Carle: This children's book helps students see the physical journey of a seed and how it survives in its environment. This resource can be found at <https://www.youtube.com/watch?v=ls6wTeT2cKA>.

- Basic Needs of a Plant: This simple slideshow helps students learn facts about what plants need. This resource can be found at <http://www.slideshare.net/guesta178af0/basic-needs-of-plants-presentation>.
- The Basic Needs of Living Things: This website provides information on the basic needs of living organisms. This resource can be found at <http://eschooltoday.com/science/needs-of-living-organisms/five-things-living-things-need-to-survive.html>.
- The Needs of a Plant Song: This song by farrahannedhaliwal helps students remember what all plants need. This resource can be found at <https://www.youtube.com/watch?v=kkqETB7Xc5g>.
- Budding Botanists at Work: This online book contains a wealth of information about plants and includes many resources, curriculum maps, and lessons. These lessons are geared toward gifted first and second grade students. This resource can be found at <http://www2.fcps.edu/TerraCentreES/discoverygarden/docs/buddingbotanistsunit.pdf>.
- 1.L.5B.2
 - Readworks.org: With a free login, non-fiction text passages and assessments may be downloaded. This resource can be found at <http://www.readworks.org/>.
 - Terrestrial Communities: The website contains background information for grasslands, deserts, and forests. This resource can be found at <http://www.nhptv.org/natureworks/nwep8d.htm>.
 - Study Jams: Plant Adaptations: The video shows how some plants adapt to their environments. This resource may be found at <http://studyjams.scholastic.com/studyjams/jams/science/plants/plant-adaptations.htm>.
 - How Desert Plants Survive: The website contains background information and photos of desert plant adaptations. This resource can be found at http://www.desertusa.com/food_chain_k12/kids_3.html.
 - Grasslands Live: The website offers background information and activities for plants and animals of the grasslands. This resource can be found at <https://grasslandslive.org/teachers/lesson-plans>.

- Plant Adaptations: The website offers links to 13 different videos of special characteristics that allow plants to survive and reproduce in specific environments. This resource can be found at <http://www.watchknowlearn.org/Category.aspx?CategoryID=2307>.
- Plants in the Mojave Desert: The website offers examples of plant adaptations in the Mojave Desert. This resource can be found at <http://mojavedesert.net/plants/plant-adaptations.html>.
- Build Your Own Rainforest!: This website offers directions for building a classroom rainforest. This resource can be found at <http://www.kidsecologycorps.org/kid-power/activities/how-tall-is-your-favorite-tree>.
- 9 Steps to Make a Terrarium Using Succulents & Cacti: This site gives directions for making a classroom desert terrarium. This resource can be found at <http://www.realestate.com.au/advice/make-terrarium/>.
- Forest Floor Terrarium: This website gives directions on how to build a classroom forest floor terrarium. Specific pictures of procedures and suitable plants are included. This resource can be found at <http://www.cas.miamioh.edu/scienceforohio/terrarium/L.html>.
- Create a Mini Grassland: This website gives directions for creating a grassland biome for the classroom. This resource can be found at <http://kidszoo.org/wp-content/uploads/2014/02/Create-a-Mini-Grassland.pdf>.
- Budding Botanists: A First and Second Grade Life Science Unit: This online book contains a wealth of information about plants and includes many resources, curriculum maps, and lessons. These lessons are geared toward gifted first and second grade students. This resource can be found at <http://www2.fcps.edu/TerraCentreES/discoverygarden/docs/buddingbotanistsunit.pdf>.
- 1.L.5B.3
 - Plant Sensitivity: Plants sense changes to the environment. This website provides examples of how plants respond to the environment. This resource can be found at <http://www.factmonster.com/dk/science/encyclopedia/plant-sensitivity.html>.
 - Phototropism and Geotropism Time Lapse Montage: Youtube video shows seed and plant reactions to light and gravity. This resource can be found at <https://www.youtube.com/watch?v=F3Oj2er-91s>.

- TeacherTreesources: Why Leaves Change Color: This document offers links to activities and books that aid in teaching how plants respond to changes in the environment. This resource can be found at <http://www.holdenarb.org/resources/documents/TeacherTreesourceswhyleaveschangecolor.pdf>.
- Budding Botanist: This online book contains a wealth of information about plants and includes many resources, curriculum maps, and lessons. These lessons are geared toward gifted first and second grade students. This resource can be found at <http://www2.fcps.edu/TerraCentreES/discoverygarden/docs/buddingbotanistsunit.pdf>.
- The Needs of a Plant Song: This song about the needs of a plant is easy for children to sing along. This resource can be found at <https://www.youtube.com/watch?v=kkqETB7Xc5g>.

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)

- 1.L.5B.1
 - What Plants Need: A Science Unit on the Functions of Plant Parts: This differentiated 6 lesson unit on plant needs can be used as possible lesson plans, strategies, and assessments. For assessments, see Lessons 1 and 6. This resource can be found at <http://www.ascd.org/publications/books/102294/chapters/What-Plants-Need-A-Science-Unit-on-the-Functions-of-Plant-Parts.aspx>.
 - What a Plant Needs: This is an exploration activity in which students draw a picture of a plant and what it needs. Use as a formative assessment. This resource can be found at https://www.teachervision.com/tv/printables/scottforesman/Sci_K_EXP_A3_5.pdf.
- 1.L.5B.2
 - Rain Forest Plants are Helpers: With a free login to Readworks.org, non-fiction passages and assessments may be downloaded. This resource can be found at <http://www.readworks.org/passages/rain-forest-plants-are-helpers>.
 - Desert or Rain Forest?: With a free login to Readworks.org, non-fiction passages and assessments may be downloaded. This resource can be found at <http://www.readworks.org/passages/desert-or-rain-forest>.

- How Plants Get Water and Food: With a free login to Readworks.org, non-fiction passages and assessments may be downloaded. This resource can be found at <http://www.readworks.org/passages/how-plants-get-water-and-food>.
- What do Plants Need? With a free login to Readworks.org, non-fiction passages and assessments may be downloaded. This resource can be found at <http://www.readworks.org/passages/what-do-plants-need>.
- What's Wrong with This Picture?: Students identify and tally each animal and plant that does not belong in the ocean environment. This resource can be found at https://www.teachervision.com/tv/printables/scottforesman/Sci_1_TOP_A3_3.pdf.
- Students should have ample opportunities to build and observe models of specific environments and investigate how the plants that live in those environments adapt to changes. Observation of classroom terrariums and discussions may lead to assessments that include but are not limited to: (1) comparing leaf structure, (2) measuring, graphing, and comparing “rainfall”, (3) measuring, graphing, and comparing plant growth, (4) comparing root structures, and (5) communicating (posters, pamphlets, oral presentations) how plants structures help them survive in different environments. For reference, the teacher should access the [SEPs In Action Checklist](#). The “Students should” column for each SEP gives a clear description of what the SEP looks like in action. Teachers may use this document to help plan instruction and performance assessments that address both content and Science and Engineering Practices.
- 1.L.5B.3
 - Collect, Sort, Graph & Count Fall Leaves: This blog contains activities for observation and collection of fall leaves with graphing ideas. This resource can be found at <http://deceptivelyeducational.blogspot.com/2014/10/collect-sort-graph-count-fall-leaves.html>.
 - Students should have ample opportunities to conduct structured investigations to observe and collect data on how plants respond to changes in the environment. Observations and data collection may lead to assessments that include but are not limited to: (1) constructing explanations of leaf color change over time, (2) constructing explanations of terrarium plants growing toward the light source, and (3) evaluating and explaining why classroom plant leaves are wilting. For reference, the teacher should access the [SEPs In Action Checklist](#). The “Students should” column for each SEP gives a clear description of what the SEP looks like in action. Teachers may use this document to help plan instruction and performance assessments that address both content and Science and Engineering Practices.

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