

Stages of Plant Development: Grade 1

Lesson Overview

In this lesson, students will demonstrate an understanding of how the structures of plants help them survive and grow in their environments. Students will also understand plants have specific structures that help them survive, grow, and produce more plants. Plants have predictable characteristics at different stages of development.

Alignment

Science Standards

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

- 1.L.5A.2 Construct explanations of the stages of development of a flowering plant as it grows from a seed using observations and measurements.

Science and Engineering Practices

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.

Mathematics Standards

1.MDA.2 Use nonstandard physical models to show the length of an object as the number of same size units of length with no gaps or overlaps.

Crosscutting Concepts (from the SDE instructional unit resources document)

- Patterns
- Cause and Effect
- Systems and systems models
- Structure and Function

<https://ed.sc.gov/instruction/standards-learning/science/support-documents-and-resources/elementary-instructional-units/1-life-science-plants-and-their-environments/>

(see page 3 of document above)

Additional Resources/Connections

SC Department of Education Links:

<https://ed.sc.gov/instruction/standards-learning/science/support-documents-and-resources/elementary-instructional-units/1-life-science-plants-and-their-environments/>

[https://ed.sc.gov/scdoe/assets/File/instruction/standards/Math/1st Grade Support Document-3_11_27_17.pdf](https://ed.sc.gov/scdoe/assets/File/instruction/standards/Math/1st_Grade_Support_Document-3_11_27_17.pdf)

Other Recommended Resources:

Plants Resources

- Plant Resources for Teachers - *TeacherVision*, <https://www.teachervision.com/plants>
- USDA Plant Database, <https://plants.usda.gov/java/>
- Plant Songs and Fingerplays, <http://www.angelfire.com/la/kinderthemes/pfingerplays.html>
- Story Jumper, Online books on Plants, <https://www.storyjumper.com/book/search/g/plants>
- Interactive Sites for Education: Plants, <http://interactivesites.weebly.com/plants.html>
- Growing Plants, Sid the Science Kid, <http://pbskids.org/video/sid-science-kid/1568868836>

Websites about SC plants – Add these to the resources section.

<http://scnps.org/>

<http://herbarium.biol.sc.edu/scplantatlas.html>

<https://www.gardenguides.com/89761-native-plants-south-carolina.html>

<http://scnps.org/wp-content/uploads/2012/04/CoastalNativePlantList.pdf>

<https://www.state.sc.us/forest/refree.htm>

Connections

Active Learning Strategies (for Purposeful Reading, Meaningful Writing, and Productive Dialogue)

- Table Talk http://www.s2temsc.org/uploads/1/8/8/7/18873120/table_talk_strategy.pdf
- Making Thinking Visible (Class Poster) https://www.s2temsc.org/uploads/1/8/8/7/18873120/making_thinking_visible.pdf
- KWL chart

What do you Know?	What do you Want to Know?	What did you Learn?

Computational Thinking

Students are engaged in computational thinking as students record their observations in their notebooks/class posters while working through collecting, organizing and analyzing data resulting from plant growth. As the teacher facilitates the conversation with students, questions posed are open ended, allowing students to brainstorm and justify answers.

*Computational thinking (CT) is a problem-solving process that includes (but is not limited to) the following **characteristics**:*

- Logically organizing and analyzing data
- Representing data through abstractions such as models and simulations

*These skills are supported and enhanced by a number of dispositions or attitudes that are essential dimensions of CT. These **dispositions or attitudes** include:*

- The ability to deal with open ended problems
- The ability to communicate and work with others to achieve a common goal or solution

Lesson Plan

Time Required – (2) 45 minute lessons **with a** 14-day Observation Period

- 1 day (1 day equals 45 minutes) for the initial lesson for part one
- 15 minutes per day for approximately 7-10 days (This time period will depend upon the growth of the beans.)
- 1 day (1 day equals 45 minutes) for the initial lesson for part two
- 15 minutes per day for approximately 10-14 days

Disciplinary Vocabulary – germination, growth, flowers, seeds

Materials Needed:

Part One

- Lima beans (2 per student)
- Quart size zip-lock plastic bag (1 per student)

- Wet paper towels (1 per student)
- Tape (2 pieces per student)
- Permanent marker for labeling bags
- Student science notebooks
- Pencils

Part Two

- 9-oz. Plastic cups (1 per student)
- Potting soil
- 3-oz. Cups of water (1 per student)
- Student science notebooks
- Pencils

Formative Assessment Strategies: Student Dialogue, Table Talk, Making Thinking Visible, KWL, Teacher Observation

Misconceptions: none noted for this lesson

Safety Note(s):

- Remind students that when we make observations we use all of our senses. The sense of taste, however, is used only in those investigations where permission is given by the teacher. Taste is **not** a sense that will be used in this lesson.
- Students should be reminded to wash their hands after manipulating the plants during the investigation.
- Remind the students not to place hands in or near their eyes until their hands are washed thoroughly.

Engage

- Introduce the lesson by asking if the students if they know what a life cycle is. A brief discussion can be incorporated here to help students understand the term life cycle and relate it to the organism(s) that were investigated in kindergarten. (NOTE: KWL to be used here) - *Link back to the discussion in the "Plant Structures" lesson.*
- Show the children a lima bean and explain to them that the bean is actually a seed.
- Explain to the children that for the next few weeks they will be exploring the life cycle of a plant by planting seeds and making observations as they grow.

Explore

Part One:

Note: Clear instructions on how students are to perform this activity need to be provided before beginning the investigation. This activity works more smoothly if the teacher prepares the “assembly line” prior to class time. The assembly line should be set up similar to the table below.

(2) lima beans	(1) wet paper towel	(1) plastic zip-lock bag	(2 pieces) tape
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- Students should be called up by small groups of 4 to 5 to get items from the assembly line. Remind students to move down the assembly line slowly so that items are not dropped.
- The students will get 2 lima beans from the container; pick up 1 wet paper towel and 1 plastic zip-lock baggie.
- Have the students put the paper towel in the bag and then add the lima beans.
- Label each child’s bag with his/her name using a permanent marker.
- Instruct the students to tape the plastic bags to a window to allow for adequate sunlight for the beans to grow.
- Allow students time to brainstorm by asking such questions as: NOTE: Table Talk to be used here: http://www.s2temsc.org/uploads/1/8/8/7/18873120/table_talk_strategy.pdf
 - What do you think will happen next?
 - How long do you think it will take before something happens to the seeds?
 - Will everyone’s seeds grow at the same pace?
 - Do you think we need to do anything else to the beans in order for them to grow? What might that be?
- Have the students draw a picture of their bag in their science notebooks and describe the illustration.
- The students will observe the lima bean daily to monitor the growth. Each day they should record (illustration and description) in their science notebooks the changes they are observing.

Part Two

- After the roots and the stems have started to grow, students will plant their seeds in a plastic cup.
- Have students remove their bean bag from the window.
- Ask them to carefully take the paper towel and beans out of the bag. Students can leave the beans on their desk.
- Give each child a plastic cup and have them come to a central location to add potting soil to their cups. Fill about two-thirds of the cup with the soil.

- Tell the students to plant the beans in the soil. Encourage students to be careful not to break any of the roots and stems that have started growing.
- Have the children come to a central location to get a small cup of water to add to their plants. (Depending on the length of observation time, students may need to add additional water to the soil as time progresses.)
- The students will observe the lima beans daily to monitor the growth. Each day they should record (illustration and description) the changes they are observing in their science notebooks. NOTE: Making Thinking Visible CLASS POSTER (inspired by their notebook entries) to be used here:
https://www.s2temsc.org/uploads/1/8/8/7/18873120/making_thinking_visible.pdf

Explain

1. Have the children to review their observations of their lima beans from the beginning of the investigation.
2. Ask students to share what they observed noting the growth from germination to seeds.
3. Explain to the children that a plant's life cycle goes through stages. Use an illustration similar to the one below to help them understand this concept.

