

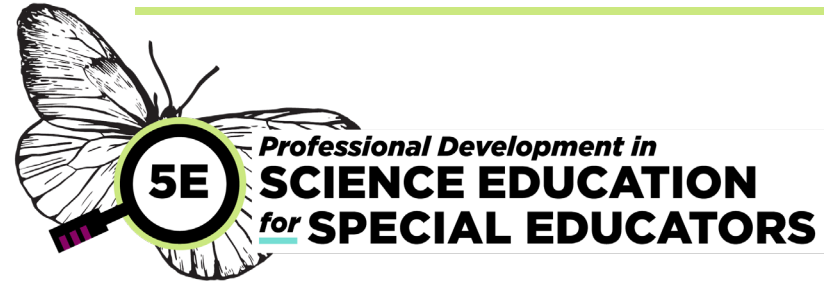
1. Lesson Plan - Essential Element

Activity/Lesson Title: Plant Growth Conditions

EE.5.LS1-1: Matter and Plant Growth Support an argument that plants get the materials they need for growth chiefly from air and water

Teacher: Ben

Grade Level: Elementary



2. Science and Engineering Practice

SEP 7: Engaging in Argument from Evidence – Utilizes the CER framework to help guide students in making or analyzing scientific claims.

3. Disciplinary Core Idea

DCI: Organization for Matter and Energy Flow in Organisms – This lesson provides clarifications for key terms.

- Photosynthesis is the process by which plants turn carbon dioxide, water, and sunlight into food to help it grow.
- Plants do not need soil to grow.
- All plants – including algae – perform photosynthesis.
- Matter is anything in the universe, which has mass and takes up space.
- Energy is what happens when matter interacts or moves; it does not take up space and it has no mass. Examples include light, sound, electricity, magnetism, and heat.

4. Crosscutting Concept

CCC: Energy and Matter – Students will see how both matter and energy are inherent components of the process of photosynthesis.

5. Linkage Level Descriptors

- Initial: Distinguish things that grow from things that don't grow.
- Precursor: Provide evidence that plants grow.
- Target: Provide evidence that plants need air and water to grow.

6. Student's Typical Accessibility Supports

- Communication device
- Visual schedule
- Graphic organizers
- Communication: picture supported text
- Access materials with support of peers due to limited use of hands
- Provide enlarged pictures, highlight with yellow (a color he is more easily able to see), and provide increased lighting due to visual impairment
- Counting supports: real objects representing what is being counted such as leaves, flowers, etc.

7. Student Prior Experiences, Prior Knowledge

- Students took a nature walk and collected, sorted and labeled items. Students categorized items that grow or do not need air, water and sunlight to grow.
- The student's family grows a garden. He participates in planting, watering, and caring for plants.
- The student's family has a variety of house plants. He takes care of the plants by watering them.
- This lesson will be designed for the Precursor Linkage Level for Keith.
- Students has experience measuring with nonstandard units of measurement.

8. Phenomenon to Explore

Question to investigate or design problem to solve

- In what ways do plants grow (e.g., roots and stems grow, grow flowers, fruit, and vegetables)?

9. Possible Alternative Conceptions

- Big things have grown (such as a rock, everything big must have grown.)
- Plants need human food to grow.

10. UDL Options and Solutions to Potential Barriers

- Use enlarged and highlighted photographs and images; increase lighting to assist with vision.
- Use tactile measurement tools for student with visual impairments
- Use sequential photos or time-lapse video of plant growing.
- Collaborate with peer for measuring and weighing objects.

11. Engage

11a. Think

- How to access student prior learning?
- How to use the CCC to connect everyday language with scientific language of the phenomenon?
- How to support student participation by scaffolding the SEP?

Teacher will:

- Show a time-lapse video of different things growing in different ways.
- Example: “There are plenty of things that grow, but how do we know if something is growing.” - Read a story about things that grow over time (e.g., The Giving Tree, How Do Plants Grow?)
- Stop at predetermined points in the story and ask students what they think is happening.

Students will:

- After the video, students will use visuals to talk about the different ways they saw things grow.
- Think about and hypothesize the different ways things grow.
- Talk about the story and share experiences about seeing things grow or their experiences with things growing.

12. Explore

12a. Think

- What is invisible or inaccessible about the phenomenon and how can the Explore phase make it more visible?
- How can students collect data in a way that reveals patterns in data?
- How to emphasize careful observation and ask good questions vs. looking for only the “right answer”?

Teacher will:

- Provide dirt (then connect to alternative conception), water, real plants, objects that do not grow.
- Provide other materials
- Ask students to figure out what grows and what doesn’t grow using their materials
- Present things that grow and do not grow and have students make decisions about things that grows, remove things students identified as growing (example: “I’d like you to measure the things you identified that grow.”)
- Present partner materials (example)

Students will:

- Explore example and nonexamples of plants and other materials (things with flowers, things with roots, things with fruits and vegetables, dirt, ball, toy car.)
- Make observations and ask questions
- Explore partner materials (e.g., onion bud and full onion, Christmas cactus with flower and without flower)
- Use measurement tools to measure partner materials that have grown

13. Explain

13a. Think

- How can students connect science topic, phenomena, data, and everyday experiences? How can students connect everyday language and scientific language? What reasoning helps students see or explain the invisible

Teacher will:

- Ask students “What are the different ways you think things grow?” and write responses on graphic organizer, whiteboard, or Smartboard (graphic projected).
- Guide the students in different ways they could measure how something has grown (e.g., longer leaves).
- Guide the students’ thinking to identify the ways in which something grows and label their graphic organizers with those ways. The teacher will guide students to conduct measurements between partner items and add the amount of growth to the graphic organizer.

Students will:

- Complete a CER statement:
- I think that plants grow.
- I think that plants grow because the onion got bigger and weighed more and the plant leaves got bigger.
- The science findings that help me explain this claim are my observations and measurements.

14. Elaborate

14a. Think

- How can I enrich or extend student ideas? Are there related science concepts or processes that would support student learning?

Teacher will:

- Provide students with new partner materials and the ‘explain’ process will be repeated for the different materials
- Monitor students to allow them to do as much of this second set of examples as independently as much as they can.

Students will:

- Add the new information to their graphic organizer.
- My findings helped me use evidence to support my claim that plants grow because I saw new plants also grew. I measured the plants and saw that the stems and leaves grew longer. I also saw that the older plant had more roots and weighed more.

15. Evaluate

15a. Think

- What information do I need to collect to inform my teaching throughout the lesson? What do I need to see or hear from my students that assures that they have learned the science content?

Teacher will

- Monitor students’ responses to questions during the lesson and review students’ data in their graphic organizers.

Students will

- Respond to questions posed by teacher, make measurements and observations, complete their graphic organizers, and complete their CER statement.