

seed TO SPROUT



FOCUS QUESTION:

HOW DO ORGANISMS FUEL THEMSELVES TO SURVIVE?

BUZZWORD:
energy

NGSS STANDARDS

PERFORMANCE EXPECTATIONS

5-LS1-1 (5-LS2-1, 5-PS3-1)

SEP - ENGAGING IN ARGUMENT FROM EVIDENCE

CCC - ENERGY AND MATTER

OBJECTIVE:

In this activity, students will germinate a seed in order to generate and record observable data. Students will use this data as evidence to engage in argument about the sources of energy and matter that a plant needs to grow and survive.

MATERIALS AND MODIFICATIONS



- **A seed** - Refer to the Additional Resources page in the Student Guide for suggestions about food items that contain seeds
- **Plastic Bag w/ a seal closure** - Any sealable clear container, such as a CD case or food storage container
- **Paper Towel** - Any napkin or paper towel that can hold moisture
- **Water** - Bottled or tap
- **Tape** - Any method of holding the bag/ container close to the window/light source

FACILITATING THE EXPERIMENT



If students are unable to access materials, carry out the investigation as a demo and allow students to record observations and gather evidence daily.



- 1. Before students start the experiment:** Activate prior knowledge about how organisms get the energy and matter they need to survive by asking students how they fuel their own bodies. Allow students to share what they know about how plants get fuel and whether they agree with Kiana or Luis.
- 2. Set up the experiment:** Help students identify seeds they have access to in fruits or plants at home and follow procedure in student guide.
- 3. During the experiment:** Remind students to observe their seed and record data daily.
- 4. Wrap up:** Discuss the “What’s Going On” questions together and guide students toward using their data to support their argument that Luis or Kiana has a correct claim.



Some seeds may not sprout. All seeds have a dormancy phase. Have students examine why their seed didn’t grow. Was it the amount of sunlight or water? What could they try next time?



WHAT'S GOING ON?



- 1. After observing your seed for 7 days, who do you agree with now: Luis or Kiana?** Have students reflect on their hypothesis and their conclusions. Are their ideas the same, or did they change? Encourage students who used similar and different seeds to compare results. What patterns do they notice?
- 2. Using the data you collected, explain why you think Luis or Kiana was correct.** Have the students use specific data from their observations in their argument. Give students the opportunity to share data with students who think alike in order to strengthen their argument. An example of a student argument could be:
“I agree with Kiana that plants use air and water as fuel to sprout because my seed grew from 0 cm tall on day 1 to 6 cm tall on day 7. Since my plant was able to grow, this means it got the energy and matter it needs from only air, water, and sunlight.”
- 3. Where did the energy and matter come from that fueled the seed to grow?** If a student’s seed successfully sprouted without soil, this means it was able to get the fuel (energy and matter) it needed from sunlight, water, and air. Students may know that plants receive energy from the sun. However, energy alone is not enough for a seed to survive. As the seed sprouts, the sprout gets larger, weighs more, and takes up more space. To do that, it needs additional material, or matter. The seed uses energy from the sun to convert nutrients and matter from both water and air into the matter needed for growth. Many plants gain additional nutrients from soil which also acts as fuel, however water and air are the primary sources of matter.



ADDITIONAL RESOURCES

Share your students' experiments on Social Media for a chance to be featured!



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EXTENSIONS

- Weigh the seed/sprout every day. Have students discuss and construct an explanation about where the increased weight is coming from.
- Compare seeds grown in varying conditions by letting students vary the amount of sun, water, or air.