

lesson topic: **Seed Germination**

overview

This lesson provides: the opportunity for students to learn about the rate of germination of a seed and growth rate of a plant. Seed packets provide information about the rate of germination (ie. 10 days till germination) and growth rate – students will have the opportunity to test how accurate the given rates are.

objectives

Students will learn:

- the fundamental importance of understanding germination and plant growth
 - the organic materials needed for plant germination
- how photosynthesis drives plant growth
- experiments that test germination needs

materials

For this lesson, you will need:

- potting mix
- radish, pea and mesclun seeds (in matching seed packets with planting information listed)
- 3" small pots or planting trays/flats
- plastic wrap

resources

Read the content packet:
"Basics of Botany"

learning activity #1

If seeds are given adequate water, warmth and appropriate potting medium, will they germinate in the time and grow to the size as indicated on the seed packets?

1. Start by asking: "What does germination mean?" and "What do seeds need to germinate?" Make sure they understand they need water/moisture and warmth to germinate/ begin to grow.

2. Follow-up with: "How long does it take for seeds to germinate?" Make sure children understand that seeds germinate at different rates – some more quickly, others more slowly, than others.

3. Share with the class the idea that in order for us to answer this question, we need to think and act like a scientist. A scientist takes a question like this, conducts an experiment to see what really happens and gathers data or facts based on the results.

4. Today, we will start an experiment that will take a couple weeks to conduct to see if seeds germinate in the time that is indicated on the seed packet if given what they need to germinate. We will observe and record what happens to the seeds each day. We will also measure the growth rate of the plant once it germinates to see how that number compares.

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5. Divide the class into three groups and give each group a packet of either radish, pea or mesclun seeds. Have the children find where it says 'rate of germination' and report how many days are indicated.

6. Next discuss with the class that we are going to pot-up the seeds, but that we have to be consistent as a group, because it is a science experiment. Based upon the discussion of technique, have each group pot-up several seeds in several pots using moistened potting mix. Make sure to show them the proper technique for planting seeds based on the size of the pots or if planting in a tray, make sure seeds are spaced accordingly. Once seeds are planted, have the children cover their pot or tray with plastic wrap. Explain to the students that watering the seeds is not necessary as long as the potting mix was properly moistened and the pot/tray is not placed in a sunny/hot spot where it will quickly dry out. Condensation should occur and will be evident with water on the underside of the plastic wrap. If water does not settle there, the wrap can be lifted and water sprayed gently to the surface of the soil, then covered again. The wrap should remain until germination is evident. This process can also occur if possible directly in to the garden beds if the timing is right.

7. Have the students use the attached **sample** journal page to create a journal so the students can record their findings. Have them record what, if anything, happens each day up until the day the seeds show evidence of germination. Have them take note of the number of days it took till germination and if it was shorter/longer/the same as the number of days indicated on the seed packet.

8. Once the seeds have germinated have the students measure and record the rate of growth of the plant every few days over the course of a few weeks. Compare this with the rate of growth that is indicated on the seed packet.

9. Discuss with the students their observations and compare them to what the other groups found. Was the rate of germination and the rate of growth the same as was indicated on their seed packet? If not, why do you suppose that was?

extending the lesson

If a planting area is available outside, use this as an opportunity to teach students how to start seeds indoors and then 'harden off' the transplants before transplanting them into the garden bed when appropriate.

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My Garden Journal

1. Today _____ we planted _____ seeds.
(today's date) *(kind of seeds)*
2. It should take _____ for the seeds to germinate.
(number of days)
3. The plant should have a rate of growth equal to _____.
(indicate rate of growth in inches or centimeters)

Here is what actually happened:

4. My seeds germinated after _____ days.
(number of days)

Here is the rate of growth once the seeds germinated *(take measurements every three days; measure from base of plant to top of plant; measure until plant reaches full maturity and fruit is ready to be harvested):*

	Rate of Growth (in centimeters)		Rate of Growth (in centimeters)
Day 1		Day 4	
Day 7		Day 10	
Day 13		Day 16	
Day 19		Day 22	
Day 25		Day 28	
Day 31		Day 34	
Day 37		Day 40	
Day 43		Day 46	
Day 49		Day 52	