Plant Investigation

Plants depend on water and light to grow.

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Grade Level	2nd Grade	**Time Frame**	3-4 Class Periods
Subject	Science	**Duration**	45 minutes

Essential Question

Do plants need water and light to grow?

Summary

in this lessons students explore and do an investigation to find out if plants need water or sunlight to grow. Students plan and conduct an experiment collaboratively to produce data to serve as the basis for evidence to answer the question. The lesson duration is 2 -4 days, plus more for sprouting of the seeds. Students have the opportunity later in the lesson modify and add new variations to their previous experiment.

Snapshot

Engage

Students will be shown one live and one dead plant. Students will record what they notice and what they wonder.

Explore

Students will practice growing plants virtually using Gizmos Growing Plants from Explorelearning.com.

Explain

Students will conduct a celery experiment which will help to explain how water travels through a plant.

Extend

Students can return to the Explorelearning website and can modify different variations from their previous experiments.

Evaluate

Students will draw a picture and explain what the dead plant might have needed to grow.

Standards

Oklahoma Academic Standards (Kindergarten)

1.ESS1: Plants also respond to some external inputs.

Oklahoma Academic Standards (Kindergarten)

2.LS2.1: Plan and conduct an investigation to determine if plants need sunlight and water to grow.
2.LS2.1.1: Plants depend on water and light to grow.

Oklahoma Academic Standards (Kindergarten)

K.LS1.1: Use observations to describe patterns of what plants and animals (including humans) need to survive.
K.ESS3: All animals need food in order to live and grow.
K.LS1.1.2: Animals obtain their food from plants or from other animals.
K.LS1.1.3: Plants need water and light to live and grow.

Attachments

- Copy-of-Celery-Observations.pdf
- Copy-of-Copy-of-GrowingPlantsSE.pdf
- Copy-of-Seed-Reflection-Journal.pdf

Materials

- Parts of a Plant by Toni D (https://www.bookemon.com/flipread/384408#book/3)
- Plants Need Water and Light Video (https://www.generationgenius.com/videolessons/plants-need-water-and-light-video-for-kids/)
- Website: www.explorelearning.com
- I Notice, I Wonder Graphic Organizer (Teacher will make on chart paper)
- Chart Paper (for I Wonder responses)
- Sticky Notes - (1 per student)
- 5 plants (1 plant per table for a group of 4 students to explore the parts of a plant)
- 4 paper cups for whole group (label each pot: 1. Sunlight and No Water, 2. No Sunlight and No Water, 3. Water and No Sunlight, 4. Sunlight and Water.
- 1 package of seeds (any will work)
- 1 small bag of potting soil
- red and blue food coloring
- Celery observation Sheet (1 per student)
- 5 cups for celery observation
- 5 pairs of scissors
- Blank paper (1 per student)
- Gizmo Growing Plants Activity Sheet (1 per student)

15 minutes

Engage

To open the lesson, the you will hold up 2 plants, 1 dead and 1 alive. In order to activate students' prior knowledge ask students, *"Why do you think my plant died?"* Then set up an "I Notice, I Wonder" graphic organizer on chart paper and display it in front of the class. Each student will then be given a sticky note to record their responses on and they will add their sticky notes to the "I Notice, I Wonder" chart paper. Go over some of the responses together as a class. These responses will help to guide the Explore activity.

2. Read aloud the book From Seed to Plant by Gail Gibbons to your class.

After reading the book, have students Think-Pair-Share with their neighbor and talk about why they think the plant may have died? *What factors could have caused the plant to die?* After a minute, have a few students share with the class what they discussed with their neighbors.

45 minutes

Explore

Plant Experiments:

Gizmos Growing Plants

1. Have students log onto their computers and go to the website www.explorelearning.com. Students can virtually explore plant growth using different factors and their outcomes. The teacher will need to model how to use the

2. Students will use the Gizmos Growing Plants activity sheet to document their findings.

Hands-On Activity (This activity will continue on for about a week)

Explain to students that they are going to design an experiment to explain what plants need to grow. They will be using seeds in this experiment.

Divide students into 4 groups. Each group will get one cup with soil already added. Each cup will be labeled as follows:

- Cup 1 - Sunlight and No Water
- Cup 2 - Water and No Sunlight
- Cup 3- Sunlight and Water
- Cup 4- No Sunlight and No Water

Ask students to discuss in their groups what all these cups have in common and ask why they think the soil is important? The teacher will then explain that soil is very important because it gives the plant nutrients. Next, the teacher will let each group pick a seed to add to their cup. The teacher will then model how to plant their seed. The students then plant their seed in their cup. After all four groups have their seeds planted, place cup 1 and cup 3 in an area in the room that receives sunlight, place cups 2 and 4 in a dark location in the room that does not receive sunlight.(*For example, in a covered shelf or under a box*). Add a little bit of water to cups 2 and 3. After each pot is placed in their locations, ask students to Turn and Talk with their group about what they predict will happen to their plants. Have a couple of groups share with the class what they discussed in their groups. Last, give each student a plant journal. They will record their plant observations daily for 1 week.

45 minutes

Explain

How Does a Plant Drink Water?

Students will be able to explain how plants take in water. They will also get to review parts of a plant which will help to explain how water travels through a plant.

Read aloud *Parts of a Plant* by Toni D. Then have students watch the video **Plants Need Water and Light.**

Student Celery Observation.

Materials:

- food coloring (blue and red) (5 bottles)
- 5 celery stalks with leaves
- 5 pair of scissors
- 5 cups

Directions:

1. Split students into 5 groups. Give each group a cup of water that is filled half full, 1 bottle of blue or red food coloring,and scissors.
2. Have students place 10-15 drops of food coloring into each cup.
3. Use scissors to cut about a half an inch off the bottom of the celery stick.
4. Place the celery into the colored water.
5. Set aside the cups for a few hours.
6. After time has passed, have students take their cup of celery back to their group. Students will observe and discuss in their groups what they notice about the celery. The goal is to see if they can make a connection between water traveling up through the stem of the celery and the way water travels from the roots up to the stem of a plant and finally reaches their leaves. You may need to recut the stems so that students can see how the water was transported up into the celery stem. Students can use magnifying glasses to get a better look.
7. Have students use the Celery Observation sheet to record their results.
8. Students will then observe live plants and their parts.

20 minutes

Extend

Gizmos Growing Plants

Students return to this site to virtually experiment with switching the variants to grow plants.

Students can come up with their own experiments. Students can modify and add new variations to the previous experiments: Such as: Will plants grow if milk is used instead of water? What happens if you use hot water instead of cold? or other similar ideas.

Ask students what other things that could be used to help plants grow faster or bigger? Students might suggest using compost or fertilizer.

10 minutes

Evaluate

Bring out the dead and live plants from beginning of the lesson. Hand out a blank sheet of paper to each student. Students will draw a picture of the dead plant and explain what this plant might have needed to grow. They can also draw the living plant and write about what this plant has that keeps it alive.

Enrichment for Gifted Learners

Some alternate or extension activities that might be cognitively challenging for your gifted learners:

- Student compare and contrast a nonfiction and fiction book about plants. Suggested texts: *Plantzilla* which tells a silly fiction story about a plant and *A Seed is Sleepy* has two layers of text and provides information about seeds and how they grow.
- Students create a card sort for their class:
  cards could be about true and false facts about plants, things plants need and don't need, or a sequence of cards showing the life cycle of a plant.
- Students take pictures of plants on the school yard and make a photo field guide for the class.

Resources

- https://www.bookemon.com/flipread/384408#book/3
- https://www.generationgenius.com/videolessons/plants-need-water-and-light-video-for-kids/
- www.explorelearning.com
- icon picture of plant: classroomclipart.com