Plants

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“Don't judge each day by the harvest you reap but by the seeds that you plant.” - Robert Louis Stevenson

Overview

How does something grow from a tiny seed into a giant tree? How many different types of plants can you name? There are nearly 300,000 types of plants that we know about so far and scientists are discovering new types of plants every year. From a giant redwood tree to a tiny clover, every plant is unique and interesting in its own way. So get your green thumb ready because this week we are going to be growing, experimenting and learning about all different types of plants!

Background Information

Plants are so important to our Earth. They give us food to eat and clean air to breathe. Plants take energy from the sun and use it as food in a process called **photosynthesis**. This is why plants need sunlight to stay alive.

Plants have **roots** that pull water and minerals from soil. We can eat some roots like carrots. Systems of roots help to keep plants stable and make it harder for them to get blown over by wind, rain or storm. Roots often have hairs on them that help the roots to better absorb minerals and water.

Other parts of plants are **stems** and **leaves**. The stem transports food and water throughout the plant. Plants store extra water in the stem. The leaves collect sunlight and are where photosynthesis takes place.

Some plants depend on insects, like bees, to spread their **pollen** and help them to reproduce or make new plants. Plants that have bright colored **flowers** attract these insects. Most plants start off as **seeds**. When these seeds get water, soil and sunlight, they sprout. The outside of the seed splits and a small plant emerges. Some plants have **thorns** to protect them from harm.

Some plants are **endangered**, there are not many of their type left on Earth. Scientists are working hard to make sure that these plants do not become extinct.

If you were going to grow a garden at your house, you should start in what season or time of year? Why? Freezing temperatures can kill many types of plants. That is why many farmers build greenhouses on their property. A **greenhouse** is a glass building that lets sunlight come through, but keeps cold weather and temperatures out. The sunlight comes though the glass and traps the heat inside the building. Greenhouses allow farmers to grow plants, fruits and vegetables even in the winter.

Main Ideas

- Plants take energy from the sun and use it as food in a process called **photosynthesis**.
- Plants have **roots** that pull water and minerals from soil.
- The **stem** transports food and water throughout the plant.
- The **leaves** collect sunlight and are where photosynthesis takes place.
- Most plants start off as **seeds**.
- Some plants have **thorns** to protect them from harm.
- Some plants are **endangered**.
- A **greenhouse** is a glass building that lets sunlight come through, but keeps cold weather and temperatures out.

Materials Needed

- *The Tiny Seed* by Eric Carle
- Clear balloon
- Radish Seeds
- String
- Glue Sticks
- Paper Towels
- Dried lima beans
- Dinner Knife
- Tissue Paper
- Straws or Pipe Cleaners
- Paper
- Dirt & Water

Preparation

1. Read “Background Information” to become more familiar with what causes items to either sink or float.
2. Read through the children’s literature that goes with this unit: *The Tiny Seed* by Eric Carle**.** Prepare questions that you can ask along the way.
3. Make sure that you have all the supplies that you will need for each day’s experiment.

Opening

How does something grow from a tiny seed into a giant tree? How many different types of plants can you name? There are nearly 300,000 types of plants that we know about so far and scientists are discovering new types of plants every year. From a giant redwood tree to a tiny clover, every plant is unique and interesting in its own way. So get your green thumb ready because this week we are going to be growing, experimenting and learning about all different types of plants!

Balloon Greenhouse

If you were going to grow a garden at your house, you should start in what season or time of year? Why? Freezing temperatures can kill many types of plants. That is why many farmers build greenhouses on their property. A greenhouse is a glass building that lets sunlight come through, but keeps cold weather and temperatures out. The sunlight comes though the glass and traps the heat inside the building. Greenhouses allow farmers to grow plants, fruits and vegetables even in the winter. Greenhouses also help to block other harmful elements like heavy rain and strong winds. **If possible, you might want to do this experiment outside. Fill up several containers with water (maybe one for every 4-6 kids). Use the funnel to place ½ cup of dirt, a few radish seeds & then ½ cup of water inside the balloon. Then blow up the balloon about ¾ of the way. Knot the inflated balloon and then use the string to hang the balloon near a window for sunlight.** The balloon, like a greenhouse, is protecting the seeds so that they can safely grow. **Over the course of this week, have students check and record the plants’ growth from day to day.**

Materials: clear balloon, radish seeds, , string, dirt, water, funnel (optional)

Read the children’s literature that goes along with this unit: *The Tiny Seed* by Eric Carle.

Baby Seeds

Most plants start off as seeds. When these seeds get water, soil and sunlight, they sprout. The outside of the seed splits and a small plant emerges. **The night before you perform this experiment, soak the lima beans in a dish of water. Let them sit out on the counter. By mid-afternoon, they will have doubled their size. That afternoon, help your students split one of the seeds in half with a knife. Have them use a magnifying glass to examine the baby plant that has already begun to grow. The thick, white fiber is the start of a root. The other side is the delicate side of the stem. The large, white protective seed is the nutrition for the plant. Wrap the remaining seeds in wet paper towels and place them in a window for sunlight. Each day, open up one more seed and make observations. Each day, add some water to the paper towels to keep them moist. You can place them in a plastic bag and tape them to a classroom window.**

Materials: dried lima beans, dinner knife, paper towels, magnifying glass (optional)

Leaf Art

Discuss the different parts of a plant. Plants have **roots** that pull water and minerals from soil. We can eat some roots like carrots. Systems of roots help to keep plants stable and make it harder for them to get blown over by wind, rain or storm. Roots often have hairs on them that help the roots to better absorb minerals and water. Other parts of plants are **stems** and **leaves**. The stem transports food and water throughout the plant. Plants store extra water in the stem. The leaves collect sunlight and are where photosynthesis takes place.

Take students on a walk outside. Allow them to collect leaves, flowers, stems, etc. Give each student a piece of paper and a glue stick. Have them create a picture using all the different parts of a plant. Encourage them to incorporate at least one root, stem, leaf and flower into their picture somehow. Let students compare all the different leaves that they found.

Materials: paper & glue sticks

(**Variation**: Students can place the flowers, leaves, etc. in between two pieces of white paper and then pound them with a rock or hammer to make pressed flower/leaf art.)

Further Exploration

Colorful Carnations (optional: would need to provide your own supplies) Plants need water in order to survive. Plants suck water out of the ground, using their roots and stems. The water then moves up the stem to the rest of the plant. Plants store water in their stems. Note: You can also do the same thing with stalks of celery.

Place 3 white carnations in 3 vases of water. Place a few drops of food coloring in each vase. It is more fun if you make each vase a different color. Over the course of a few days, the water will be taken up through the stem to the flower, turning the flower the color of the food coloring.

Materials: white carnations, vase, food coloring, water

Plant Dissection
Have students collect a variety of plants on a nature walk. Take them back inside and give students time to dissect the flowers, leaves, etc. Talk about the different parts of a plant.

Tissue Paper Flowers
Have students place 2-3 pieces of tissue paper on top of each other. Then fold one edge in about 1 inch. Continue folding back and forth until it looks like an accordion. Cut the accordion into 3 parts. Attach or fold a pipe cleaner or straw around the center of each part. Cut rounded edges on the ends of your 3 flowers. Gently open up the flower accordion, fluffing each layer.

Materials: tissue paper, straws or pipe cleaners

Wrap Up

- Use celery stalks or carnations and food coloring to watch how water is used in a plant.
- Have students brainstorm other plant experiments that they could try.
- Have students explain to a friend what plants need to survive.
- Go on a Nature Walk. Collect a variety of different plants. Bring them back to the classroom and allow students to dissect them. Discuss the different parts of plants.

Signs of Success

The student will…

- Demonstrate engagement and curiosity by performing the plant

experiments.
- Describe what they have seen or done, explain what they still want to try, and make predictions for outcomes for new ideas.
- Come up with plant growth of their own that they would like to try.
- Express interest in continuing to watch their new plants grow well after this weeklong unit is over.
- Grow plants of their own at home.

Other Books to Explore

A Fruit is a Suitcase for Seeds by Jean Richards
The Tiny Seed by Eric Carle
A Seed Is Sleepy by Dianna Aston & Sylvia Long
The Tree by Dana Lyons
Pick, Pull, Snap! Where Once a Flower Bloomed by Lola Schaefer
Jack's Garden by Henry Cole
The Dandelion Seed by Joseph Anthony and Cris Arbo
In a Nutshell by Joseph Anthony and Cris Arbo
Hungry Plants by Mary Batten and Paul Mirocha
To Be Like the Sun by Susan Swanson
One Bean by Anne Rockwell & Megan Halsey
Poetrees by Douglas Florian
Oh Say Can You Seed? All About Flowering Plants by Bonnie Worth & Aristides Ruiz
Living Sunlight How Plants Bring the Earth to Life by Molly Bang
A Tree Is a Plant by Clyde Robert Bulla
Red Leaf, Yellow Leaf by Lois Ehlert

Pennsylvania Educational Standards

Reading 1.2.3 A, D, E
1.6.3 A, B
1.8.3 A, B

NRC National Science Educational Standards

Content Standard A: Science as Inquiry
Content Standard B: Physical Science

AAAS Benchmarks for Science Literacy

12A Values and Attitudes
12D Communication Skills

Sample Schedule For Making It A Week Long Unit

Day 1:
Introduce the new unit on plants.
Balloon Greenhouses Activity
Discuss what plants need to grow.

Day 2:
Read *The Tiny Seed* by Eric Carle
Baby Seeds Experiment
Discuss the life cycle of a plant.

Day 3:
Nature Walk
Leaf Art

Day 4:
Share a variety of other children's literature on plants, trees, flowers, etc. There are so many great books out there on this topic!
Colorful Carnations Activity
Or Tissue Paper Flowers

Day 5:
Nature Walk
Plant Dissection
Review all that we have learned this week about plants and how they survive.