

PLANTS AND POLLINATORS

KINDERGARTEN-SECOND

TEKS

Kindergarten: K.9A, K.9B, K.10A, K.10B, K.10C, K.10D

First Grade: 1.9A, 1.9B, 1.9C, 1.10B

Second Grade: 2.9A, 2.9B, 2.9C, 2.10B

Vocabulary

abdomen, air, animals, antenna, aquarium, basic needs, compound eyes, dormancy, eyes, food chain, fibrous roots, flower, food, fruit, habitat, head, interdependence, location, leaves, life cycle, limbs, living, nonliving, nutrients, offspring, organisms, phloem, photosynthesis, plants, precipitation, proboscis, roots, seedling, shelter, stem, sunlight, tap roots, temperature, terrarium, thorax, xylem, water

Pre-Show Activity

Pre-Show Lesson: Parts of a Plant

Post the question on the board, "Do you eat plant roots, stems, leaves, and flowers?"

Materials:

Various pictures of plants, roots, stems, leaves, flowers, seeds, fruits, insects, animals- include cactus, grass, algae, and seaweed

Various pictures of nonliving objects - include sand, soil, rocks, wind, and water

Items listed in the supplies column for the centers

Procedure:

1. Give each group an assortment of pictures of living and nonliving objects.
2. Tell groups to classify the objects into two groups - living and nonliving. Discuss with kids why objects are living or nonliving. Help students come up with a rule to help identify living organisms.

Students should know that living organisms have needs. Animals need food, water, air and shelter. Plants need air, water, nutrients, sunlight and space. They should also know that living organisms need to produce offspring in order for the species to survive. Students may create a Venn diagram comparing the needs of plants and animals. This can be done as a whole class or in small groups depending on the level of your students. With lower level students you may want to create hand signs for each need. For example, students can pretend they are eating to represent food, pretend to be drinking for water, put their hands over your head in an upside down V, like the roof of a house, for shelter and put both hands in front of them with your fingers spread for sunlight.

3. Set up plant centers in your room so that kids can explore the parts of a plant and their pollinators: Seeds, Roots, Stem, Leaves, Flower, and Pollinators. (See Appendix A-1 and A-2)
4. Debrief: Students meet on the carpet to discuss what they learned. Make sure you review the plant parts and what their functions are. Remind students that we can eat all parts of plants- review examples from centers. Be sure to also tell them that they should never eat a plant that they are not familiar with. Some plant parts are poisonous!

Pre-Show Activity Option for Younger Students

As a simpler option, for younger students, you may want to have them grow lima bean seeds in a bag to observe the parts of a plant. The class can choose a variable - like amount of sunlight or water to test. The example below is set up for an experiment testing how water affects germination. Sunlight is also an interesting variable to test because students usually think that plants need sunlight to germinate, however they do not. The seed has enough food stored in it for the plant to germinate. It just cannot continue growing until it begins to make its own food through photosynthesis for which it needs sunlight to accomplish.

Problem - How does the amount of water affect seed germination?

1. Soak enough lima beans in water overnight to give each child 2 wet beans. They will also need 2 dry beans. Soaking the beans in water helps the germination process.
2. Lay four or five sheets of paper towels on top of each other. Spread the soaked beans in a single layer on the paper towels. Place another layer of four or five paper towels on top of the lima beans. Each student will have 2 wet beans. (You could do this in partners or in small groups if you do not have enough resources.)
3. Fill a spray bottle with water. Spray the paper towels with a fine mist of water until they are thoroughly damp.

4. Slide the moistened paper towels, with the beans between them, into a quart or gallon-size plastic zippered bag.
5. Seal the zippered bag tightly. Leave some air inside the bag to aid in the germination process. Place the sealed bag on a windowsill to allow the beans to stay warm and receive plenty of sunlight.
6. Repeat the steps above except without any water. Do not spray the beans or the paper towels. You will just put the dry beans on dry paper towels into a dry baggie. Be sure that you use the same type of paper towels, baggies and beans so that it is a fair test. The only variable that should be different is the presence of water.
7. Check on the beans in the bag every day and spray more water on the paper towels if they appear dry. Green shoots should begin sprouting from the roots in a few days.
8. Students will observe the plants and draw and label them in their science notebook. You may also want to have them measure their plants, in nonstandard measurements such as one inch color tiles. They may also graph their results using one inch graph paper with the colored tile measurements. The graph should compare a watered seed to a non-watered seed.
9. Draw conclusions from the experiment. Students should have learned that plants need water in order to germinate. When seeds are in the resting state, they are said to be dormant. If they have an appropriate temperature and water, they will germinate.

Post-Show Enrichment Activities

Activity One: Plant Parts Foldable

Students will create a plant foldable in which they will identify the four parts of a plant, draw the corresponding part and if age appropriate, describe what it does. (See Appendix A-3)

For young students, teacher may need to assist in the folding and cutting.

Activity Two: Edible Plant Parts

Allow students to eat plant parts: stem - celery or rhubarb, leaf - lettuce or cabbage, flower - broccoli or cauliflower, seed - sunflower seeds, peas, fruit - apple, orange, etc.

This activity may be combined with the plant foldable. Instead of having students open the flap and draw any example they want, they can use the examples of what they ate as their drawings for the inside page.

Activity Three: Insect Field Guide

Take students outside to go on an insect hunt. Make sure that you tell them not to touch any insects because some insects bite or sting. If possible, they can capture the insect in an insect jar. You can often get these at a discount store or make them from small, clear, plastic containers. Have students draw at least two different insects looking carefully to observe all body parts. If you have insect field guides, the students can use these to try to identify the insects. Take students inside and have them share their drawings in their groups.

Debrief: What body parts do most insects have in common? Lead students to identify the three main parts of an insect - head, thorax and abdomen. Also help them to identify smaller parts such as antenna, compound eyes, 6 legs, wings, mouth and possibly a proboscis. Next, have students choose one of their insects that they want to include in a class field guide. They are to very neatly draw that insect with all of the discussed body parts identified. They will use an insect field guide to help identify the name of that insect and tell something interesting about it. The teacher will then put these pages together to make a class insect field guide. Students can take this out to recess with them and see if they can re-find the identified insects.

Activity Four: Read Aloud

Read *The Tiny Seed* by Eric Carle. Discuss the life cycle of the seed - germination, pollination, etc. Discuss how the seed traveled and how its needs were met. Give each child a seed. Tell them that they are going to create their own story, either in words or pictures, to tell the travels of their tiny seed.

Activity Five: Insect Art

Students can create a model of an insect using clay, pipe cleaners, googly eyes, and various other craft materials. Review body parts of an insect, and make an anchor chart. (head, thorax, abdomen, 6 legs, antenna, eyes, wings) Discuss with students where they have seen insects living and where their insect might be found and why. What kinds of things would this insect need in its habitat? (food, water, shelter) Ask students what their insect might eat for food? Students can then create a habitat for their insect. They would need to make sure that the habitat includes everything that the insect would need in order to survive. You may want to make an anchor chart that lists these (food, water, shelter). Students can display their work in an “insect museum”.

Activity Six: Seed Mosaic

Give students a nature picture print off or have them draw one. Have students use seeds to make a mosaic piece of art. Students can use lima beans, kidney beans, sunflower seeds, bird seed, etc. to create their artwork.

Appendix

A-1

Center	Supplies	Possible Activities
Seeds	<p>Various seeds- bird seed, lima beans, peas, kidney beans, acorns, maple seeds, a coconut, flower seeds, grass seed, corn, etc.</p> <p>You may want to ask kids to bring these in.</p>	<ol style="list-style-type: none"> 1. Sort objects by seed or not a seed. 2. Sort seeds by color. 3. Sort seeds by shape. 4. More advanced students may sort seeds by how they travel. Make copies of the Encyclopedia Britannica chart below for them to use as a reference.
Roots	<p>Various plant roots include a leafy carrot and a radish</p> <p>You can pull some weeds out of your yard to get root samples.</p>	<ol style="list-style-type: none"> 1. Have students draw a tap root (carrot) and a fibrous root. 2. Sort roots by tap or fibrous. 3. Compare the tap root and fibrous root.
Stem	<p>Celery, water, food coloring, two beakers, plastic knife</p> <p>This station should be set up the day before. Place a few leafy celery stalks in a beaker of plain water. Place a few leafy celery stalks in a beaker of red food coloring water.</p>	<p>Cut open the celery stalks so the students can observe the tubes in the stalks or stems (xylem and phloem). Students should be able to see that the tubes are red in the red colored water which tells us that the tubes are absorbing the red water. They can compare this to the plain water so they know that the tubes are not naturally red. Students can draw this. They may also want to use arrows and explain how the water is traveling.</p>
Leaves	<p>Various leaves- include lettuce</p> <p>You may want to have students bring leaves in ahead of time.</p>	<ol style="list-style-type: none"> 1. Sort leaves by shape. 2. Sort leaves by color. 3. Sort leaves by size. 4. Make a leaf rubbing.
Flower	<p>Various flowers or flower pictures- include cauliflower and broccoli</p>	<ol style="list-style-type: none"> 1. Sort flowers by shape. 2. Sort flowers by color. 3. Advanced students can create a detailed drawing of a flower with all its parts and color it. Younger

		students may need to be provided with flower pictures to color, cut and paste.
Pollinators	Pictures of bats, butterflies, hummingbirds, moths, flies, bees and flowers	<ol style="list-style-type: none"> Sort pictures by type of organism. Have students use the cards to act out pollination. Advanced students can create a detailed drawing of a pollinator. Younger students may need to be provided with a picture or pictures to color, cut and paste.

A-2

How Seeds Travel

by the wind



milkweed



dandelion



maple

by animals



beggar-ticks



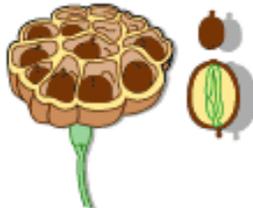
sandbur



blackberry

by water

lotus



cattail



coconut

by bursting

violet



jewelweed



witch hazel

by humans



bean



wheat



cherry

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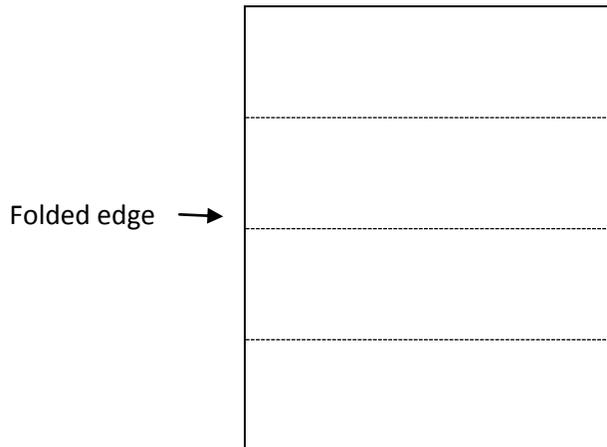
A-3

Directions for Plant Foldable

1. Students will fold a piece of paper in half the long way. They will then fold that in half a second time so there are four equal parts.

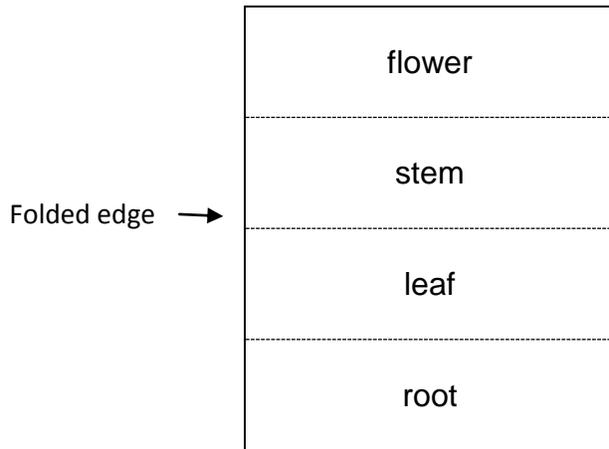


2. Next, unfold the paper, and fold it once the shorter way (hamburger style). Keep it folded- like a book.



3. Cut on the dotted lines on the top page only so that the top page is divided into four sections that open and close along the folded edge.

4. Label the following plant parts on each flap of the cover.



5. Open each flap and on the inside page draw the corresponding part. For older students you may want to have them draw and label on the outside flap and describe the function of each part on the inside flap.