

# PLANTS AND POLLINATORS

## THIRD-FIFTH

### Life Science TEKS

*Third Grade:* 3.9A, 3.9C, 3.10A, 3.10B, 3.10C

*Fourth Grade:* 4.9A, 4.9B, 4.10A, 4.10B, 4.10C

*Fifth Grade:* 5.9A, 5.9B, 5.9C, 5.9D, 5.10A, 5.10B,

### Life Science Vocabulary

adaptations, anther, carbon dioxide-oxygen cycle, carnivores, characteristics, communities, consumers, decomposer, ecosystem, environment, filament, food chain, food web, herbivores, inherited traits, interact, learned behaviors, life cycle, omnivores, organisms, ovary, ovule, perish, photosynthesis, pistil, pollen, populations, predator, prey, producers, relationships, sepal, stamen, species, survive, thrive

### Pre-Show Activity

#### Pre-Show Lesson: Dissecting a Flower

Post this question on the board: “*Why do some plants have flowers?*”

#### *Materials:*

This activity is best done in partners. If you do not have enough materials though, you could do it in groups of 3-4.

#### Per pair:

3” x 3” black construction paper, magnifying glass, ruler, toothpick, clear tape, labeled diagram of a flower (check the science text book)

1 flower - alstroemeria (lily) work well-

They are inexpensive and you can get them at the grocery store.



*Procedure:*

1. Ask students to turn and talk in their groups about the question on the board.
2. Tell students that they are going to be dissecting flowers today to see if they can find the answer to that question.
3. Have students create an observation chart in their science notebook. (Appendix A-1)

You may choose to add more flower parts based on the level of your students. Students will use the diagram and information in their science book to correctly identify and explain the parts of the flower. If there is not a diagram in their science book, there are many resources on the Internet.

4. Go over any directions, including safety procedures. Pass out materials.
5. Using the tape, students can attach each flower part in the drawing/example box of the table, or they can draw a picture.
6. Have student tap the anther of one of the stamen on the black construction paper and use the magnifying glass to observe the pollen.
7. Students will use the toothpick to open up the ovary and observe the ovules.

See Appendix A-2 for teacher information on the parts of a flower and their functions.

8. Debrief: When the students have finished taking apart their flowers and identifying the parts, have them come to the carpet with their notebooks. Discuss the adaptations for each flower part listed above. This is also a good time to discuss inherited traits of the plant/flower. Students can add notes to their chart. Ask again, "What is the purpose of the flower?"
9. Read, *The Reason for a Flower* by Ruth Heller.

## Post-Show Enrichment Activities

### Activity One: Dissecting Fruit to Learn about Life Cycles

Before doing this lesson, assign students to bring two or more fruits or vegetables from home. Some inexpensive fruits and vegetables are: grapes, green beans, snow peas, etc. You may want to bring a few extras. Have students classify each food item as a fruit or vegetable. Remember that if it has a seed in it, it is considered a fruit. Using plastic knives, have students dissect the fruit to find the seeds. Be sure to teach students knife safety. Even though it is plastic, it can cut them. Use your professional judgment; the teacher may need to cut the fruit. If students are cutting an acidic fruit, they may want to wear safety goggles.

Another option for this lesson would be to just use pictures.

Once students identify the seed, they should draw or tape it into their science notebook and complete a life cycle drawing for each fruit. Be sure to connect it back to the flower lesson. Every fruit was once a flower that had to be pollinated. Students may raise a lot of questions from this activity like:

- How did we get seedless fruit?
- Where are the seeds in a banana?
- Why do we call some fruits vegetables?

You may want to collect these questions and post them for further inquiry.

### Activity Two: Adventures of a Seed - How Seeds Travel

Before doing this lesson, assign students to collect seeds from their neighborhoods. Have students classify the seeds according to how they travel: wind, water, animals (either by sticking to their fur or being digested and deposited in their waste). Discuss why they put them in each group. Have students choose a seed and write a story about their life as a seed. The story should start from their conception in a flower to their germination and growth into a new plant.

### Activity Three: Food Webs

1. Teacher will introduce what a food web is. You will want to show a diagram of this. There is probably a diagram in their science text book. If not, you can find them on the Internet. Be sure that the arrows show the direction that the energy is going. Students often point them in the wrong direction. They think that they need to have the predator pointing to its prey - the food that

they are eating. You may want to find one where the arrows are pointed in the wrong direction and ask the students what is wrong with the diagram. Be sure to review words like: producer, consumer, predator, prey, herbivore, omnivore, carnivore, decomposers, sunlight (source of energy), and how pollution, habitat loss, etc. affect the food chain. (Appendix A-3)

2. Take students outside into your schoolyard to observe the life in the bushes, trees or grass around them. On a clean paper in their research notebook, they can create a food web based on the life around them. They may also include examples that may live here, but are not currently visible. The food web should include at least 10 organisms. Be sure to include arrows to show the flow of energy. Each organism should be drawn neatly with detail. Students can use colored pencils.

3. Students will complete an observation chart in their notebook. (Appendix A-4)

You may want to let students use their science books to help them with the definitions or you may need to give them the definitions of these words.

#### Activity Four: Plant Parts Foldable

1. Students will create a plant parts foldable identifying the four main parts of a plant and their functions. (See Appendix A-5 for directions.)

Flower - attracts insects and makes seeds

Stem - carries water

Leaf - makes food using sunlight

Root - takes in water

#### Activity Five: Experimenting with Seeds

Discuss the needs of plants - sunlight, water, air, space (location with appropriate temperature), and nutrients (found in soil). As a class, choose one variable that you would like to test. Design an experiment to test this. Lima bean seeds or grass seed works well. Although you are working as a class, each group should be setting up their own experiment so that you have results from each group to compare.

Example -

Problem: How does sunlight affect plant growth?

Hypothesis: Students write/draw predicted results.

Procedure: Students write/draw the procedure. If you are testing light, each group should have a plant that gets light and one that doesn't. To ensure that it is a fair test, make sure that everything about the plants is the same (amount of soil, water, etc.) except the amount of sunlight.

Students will want to record their results once or twice throughout the week. They can measure the height of their plant using standard or nonstandard measurements each time. They should be recording this in a data chart.

After about two or three weeks, you should be ready to end the experiment and draw conclusions. Collect data from all 6 groups and make a class data chart. Students should graph this either as a class or in groups according to their level.

### 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

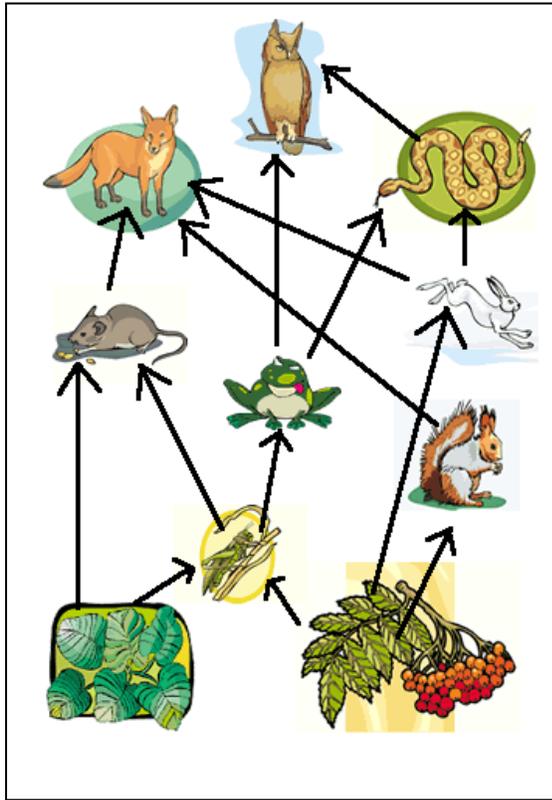
A-1

Name of Part	Scientific Drawing/Example	Purpose or Function
petal		
stem		
pollen		
ovary		
stamen		

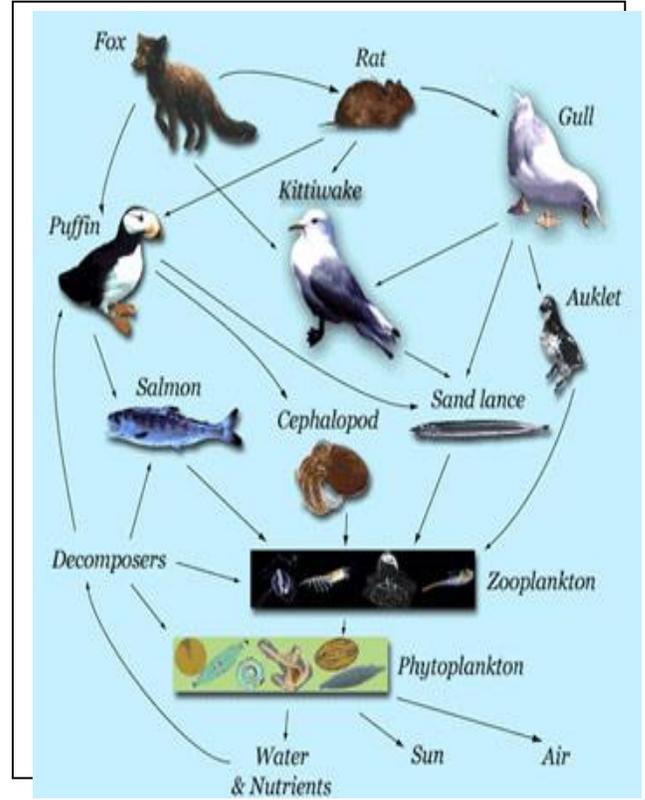
**A-2**

Teacher Information:

The Flower Parts:	
Flower part:	Function of the part:
Petal	Petals are used to attract insects into the flower; they are usually colorful, may have guidelines on them and are scented.
Stigma	Is covered in a sticky substance that the pollen grains will adhere to. Students can remember “sticky stigma”.
Style	The style raises the stigma so that when an insect enters the flower, it will easily rub off on the stigma.
Ovary	This protects the ovule and once fertilization has taken place it will become the fruit.
Ovule	The Ovule is like the egg in animals and once fertilization has taken place, it will become the seed.
Flower Stem	The stem gives support to the flower and elevates the flower for the insects.
Sepal	Sepals protect the flower while the flower is developing from a bud.
Filament	The filament holds the anther up near the top of the flower.
Anther	The anthers create the pollen. When insects enter the flower, they inadvertently rub against the anther. The pollen is deposited on their bodies and will then be transferred to the stigma of another flower or the same flower.
Please note: The stigma, style, ovary, and ovule are known as the pistil or female part of the flower. The filament and the anther are known as the Stamen or the male parts of the flower.	



Correct Food Web



Incorrect Food Web

**A-4**

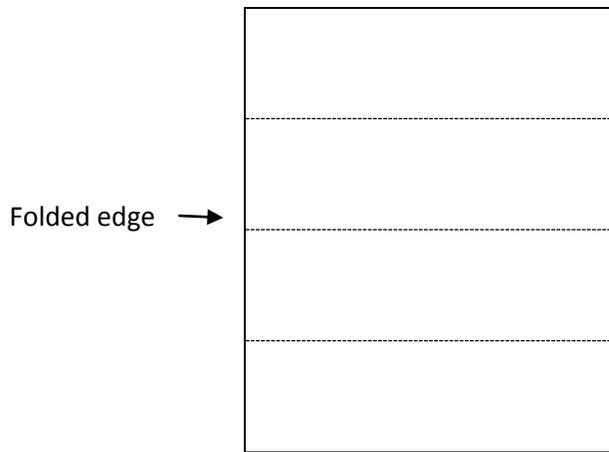
Producers in our Community	Consumers in our Community
	Herbivores:
	Omnivores:
	Carnivores:
Decomposers:	

**A-5**

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.

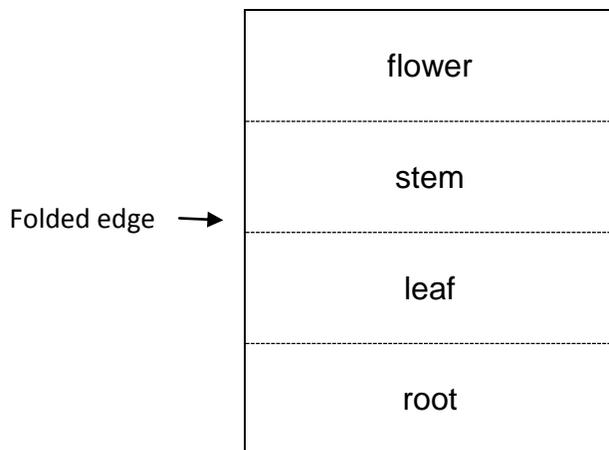


2. Next, unfold the paper, and fold it once the shorter way (hamburger style). Keep it folded- like a book.



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 and draw a picture of the following plant parts on each flap of the cover.



5. Open the flaps and on the inside page tell or draw what each plant part does. You may also want to have students draw an edible example of each plant part.

Flower - attracts insects and makes seeds

Stem - carries water

Leaf - makes food using sunlight

Root - takes in water