Name: _____ Date: _____

Student Exploration: Pollination: Flower to Fruit

Vocabulary: anther, cross pollination, filament, fruit, nectar, ovary, ovule, pedicle, petal, pistil, pollen, pollen tube, pollination, receptacle, self pollination, sepal, stamen, stigma, style

Prior Knowledge Question (Do this BEFORE using the Gizmo.)
Plants use sunlight to produce sugar. Flowering plants make some of this sugar available to animals in the form of **nectar** (a sweet liquid found in flowers) and **fruit**.

1. Why do plants provide bees, butterflies, hummingbirds, and other animals with nectar?

   _____

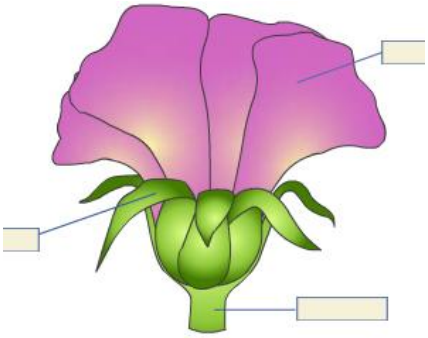
   _____

2. Why do plants provide animals with fruits such as strawberries, apples, and mangoes?

   _____

   _____

Gizmo Warm-up
Plants don't produce nectar and delicious fruit just to be nice. As you will learn, bees and other pollinators play a critical role in helping plants to reproduce. Fruits play a role in allowing plants to spread to new locations.



The *Pollination: Flower to Fruit* Gizmo™ will take you through the reproductive cycle of flowering plants. To familiarize yourself with some of the parts of a flower, begin on the IDENTIFICATION tab.

1. Look at the list of **Flower Parts** on the left. Which of these parts have you heard of before?

   _____

2. On the **Closed view**, drag the **Petal**, **Pedicel**, and **Sepal** terms into the correct spaces. (Use trial and error.) Turn on **Show information about selected parts of the flower**.

   A. Which structure protects a maturing bud? _____

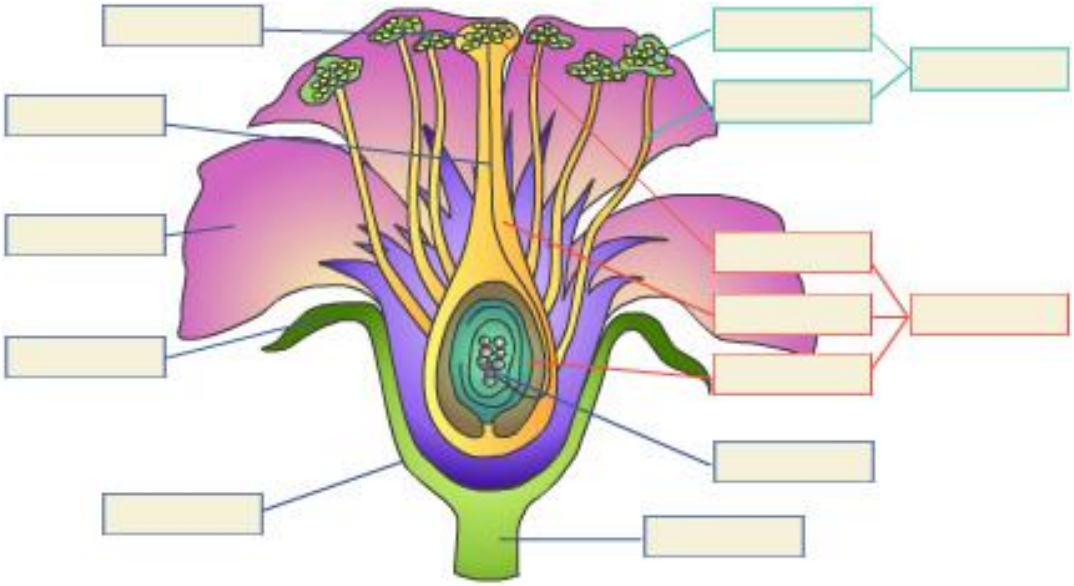
   B. Which structure is a stalk that supports a single flower? _____

Activity A: **Flower anatomy**	Get the Gizmo ready: • On the IDENTIFICATION tab, select **Opened view**.	

Goal: Identify the parts of the flower.

1. Label: Drag the terms you have learned so far (**Petal**, **Pedicel**, and **Sepal**) into the diagram of the opened flower. The text at the top should say "Current status: 3 correct out of 14." Add these terms to the diagram below.

   Opened view



   A. The **receptacle** is a cup-like structure that holds the flower. Label the receptacle on the Gizmo and then add this term to the diagram above.

   B. The male part of the flower is called the **stamen**. It consists of two structures, a long, thin **filament** topped by an **anther**. Label these three structures in the Gizmo, and then add these terms to the diagram above.

   C. The female part of the flower is called the **pistil**. It consists of a sticky top surface called the **stigma**, a shaft called the **style**, and an **ovary** that encloses small structures called **ovules**. Label all five parts in the Gizmo and in the diagram above.

   D. Male sperm cells are contained within **pollen** grains. After a pollen grain moves from the anther to the stigma, a **pollen tube** grows through the style to an ovule. Label the last two structures in the Gizmo and in the diagram above.

   If the current status now reads "14 correct out of 14," then congratulations! You have identified all of the flower parts correctly. If not, revise your labels until they are correct.

(Activity A continued on next page)

Activity A (continued from previous page)

2. Identify: If necessary, turn on **Show information about selected parts of the flower**, and read the information for each part. Identify the following parts from their descriptions.

   A. These grains contain male gametes (sperm cells): _____

   B. This structure contains female gametes (egg cells): _____

   C. This colorful structure attracts pollinators to the flower: _____

   D. This structure has a sticky surface to trap pollen grains: _____

   E. This structure produces and stores pollen: _____

   F. These structures allow sperm cells to move through the style: _____

   G. This cup-like structure holds the flower: _____

   H. These structures protect the maturing flower bud: _____

   I. This structure contains the female organs of a flower: _____

   J. This structure contains the male organs of a flower: _____

Activity B: **Pollination**	Get the Gizmo ready: • Select the POLLINATION/FERTILIZATION tab. • Check that **Self pollination** is selected.	

Question: How do flowering plants reproduce?

1. Describe: Flowering plants reproduce by a process called **pollination**. Pollination is the transfer of pollen from the male to the female parts of the flower.

   How do you think pollination takes place in flowering plants? _____

   _____

   _____

   _____

2. Summarize: Follow the directions in the Gizmo to observe the steps of **self pollination**. In your own words, describe what happens in each step.

1	
2	
3	
4	
5	

(Activity B continued on next page)

Activity B (continued from previous page)

3. Explain: What is the purpose of a fruit? _____

_____

_____

4. Think and discuss: Think about what might happen to an apple when a deer finds it. How do you think this will help to spread the seeds in the apple? If possible, discuss your answer with your classmates and teacher.

_____

_____

_____

5. Compare: Click **Reset**, and select **Cross pollination**. Go through the steps of **cross pollination**. How does cross pollination differ from self pollination?

_____

_____

6. Think and discuss: Think about how pollen might travel from one flower to another.

   A. What are some of the ways that pollen can travel from one flower to another?

   _____

   _____

   B. Based on your answer to part A, why do you think many plants produce sweet nectar? _____

   _____

3. Infer: Some flowers are pollinated by wind or water. How do you think the petals of these flowers will be different from the petals on flowers pollinated by animals?

_____

_____