

Name: _____

CASE

Activity 7.2.1 An Egg is Not Enough

Purpose

Previously, you have learned about the importance of plant genetic material. The transfer of pollen from anthers to stigmas, called pollination, initiates the process of fertilization. How do pollen grains actually reach plant ovules?

For some types of inflorescence, pollen may fall from the anther to the stamen of the same flower to self-pollinate. How do dioecious flowers, such as corn, pollinate? How do plants cross-pollinate in nature?

Why is pollination important? What happens if plant egg cells are not pollinated?

Materials

Per pair of students:

- Computer with Internet access
- *Activity 7.2.1 Pollination Scenario Cards*

Per student:

- Pencil
- *Agriscience Notebook*

Procedure

Through this activity, you will research the various ways that plant flowers receive pollen. Then you will read scenarios describing pollination of 10 different plants and try to determine which method of pollination brought about the results described.

Part One – Identify the Agents

1. Your teacher will assign you and your partner a type of pollination to research.
2. Using the Internet, research the assigned various type of pollination. Record your findings in Table 1 on the student worksheet.
3. In the third column, mark whether the plant is most likely self-pollinated, cross-pollinated, or both.
4. Your teacher will direct you when to share researched pollination types. Share your information when it is your turn.

5. As other pairs share their pollination agent research, write a brief description of each in the space provided in Table 1.

Part Two – Expose the Agents

1. Your teacher will provide you and your partner with a set of *Activity 7.2.1 Pollination Scenario Cards*.
2. Read the scenarios given and take note of a few clues that may help you determine how pollination was achieved.
3. Use the information from Table 1 to determine the type of pollination that has taken place. Record your responses in Table 2.
4. Your teacher will lead a class discussion and share the correct pollination agent for each scenario.

Conclusion

1. How does flower shape and structure determine the type of pollination agent?

The flower shape and structure determine the type of pollination agents by the shape and size. The shape and size helps you determine how much pollination it will have.

2. If no pollination agents were at work, what would the effect on plant production be?

The effect on the plant production would be that if there is no pollination in the plant no insects or animals would be attracted to the plants. Also, that means that it would lower the plants population.

3. Which type of pollination holds the most value for agriculture? Why do you believe this is so?

Ornithophily holds the most value for agriculture. I believe this because birds are the biggest impact to us in this world. The birds help pollinate the plants by a lot.

4. What other factors may influence pollination rates?

The other factors that may influence pollination rates is smell, and color. The reason why for smell, and color is because a lot of animals will be attracted to it.

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Activity 7.2.1 Student Worksheet

Table 1. Agents of Pollination

Pollination Type	Description	Is the plant self-pollinated, cross-pollinated, or both?
Anemophily	Anemophily or wind pollination is a form of pollination where pollen is distributed by wind. Almost all gymnosperms are anemophilous, as are many plants in the order Poales, including grasses, sedges and rushes.	Cross-pollinated
Cantharophily	It gets pollination by beetles. Beetles pollinate flowers that are usually large, greenish or off-white in color and heavily scented. The scents are maybe spicy, fruity, or similar to decaying organic material.	Both
Chiropterophily	It pollinates bats (Chiroptera). Bat pollinate flowers that are large and showy, white or light colored, open at night and have strong odours. Bats drink the nectar the plants typically nectar for extended periods of time.	Both
Hydrophily	Hydrophily is a fairly uncommon form of pollination where pollen is distributed by the flow of waters, particularly in rivers and streams. Hydrophilous species fall into two categories: those that distribute their pollen to the surface of water, and those that distribute it beneath the surface.	Self-pollinated
Hymenopterophily	Its pollination comes from bees.	Both
Myrmecophily	It refers to mutualistic associations with ants, though in its more general use the term may also refer to commensal or even parasitic interactions.	Both
Myophily	There are two main types of fly pollination: myophily and sapromyophily. Myophily includes flies that feed on nectar and pollen as adult	Cross-pollinated
Ornithophily	Ornithophily or bird pollination is the pollination of flowering plants by birds. This coevolutionary association is derived from insect pollination (entomophily) and is particularly well developed in some parts of the world, especially in the tropics	Cross-pollinated

	and on some island chains.	
Phalaenophily	Phalaenopsis is one of the most popular orchids in the trade, through the development of many artificial hybrids. Phal in the horticultural trade, is an orchid genus of approximately 60 species.	Self-pollinated
Psychophily	The pollination of flowers by butterflies.	Both

Table 2. Pollination Scenarios

Scenario	Clues	Type of Pollination
1	The pollination agent covered a small area. Its pollen from multiple plants in a field. In the petals and stigma of a head-type flower.	
2	Pollen is found on the top side of multiple flowers in a garden. The nectar is located deep within a long, thick, and narrow tube.	
3	Fresh pollen from a large, sweet-smelling, white flower is found inside multiple others. The flower buds don't open before the previous evening.	
4	Pollen from one large, aromatic flower from a night-blooming plant is found on another. The narrow passageway to the nectar supply is surrounded by anthers.	
5	Pollen produced by stamens within the disc of the flower was transferred to the stigma within the same disc. The pollinator was in search of nectar and pollen for food.	
6	Pollen from a plant nearly a mile upstream is discovered on the stigma of a flower. No sign of animal interference is found on the scene.	

7	Pollen was produced by a staminate flower at the top of the plant and transported to a pistillate flower located along the stalk of the plant. No sign of animal interference is found on the scene.	
8	Many large, sweet-smelling pink flowers in a large area were discovered to have been pollinated during the daytime. The plant's nectar was harvested by the pollinating agent, but no pollen was digested.	
9	The pollen from a low growth habit plant with closely bunched flowers is found on a neighboring plant. Pollen was found on multiple flowers, stem, leaves and the ground surrounding the plant.	
10	A simple, pale, dull-colored flower is found with pollen from another plant. It has both female and male flower structure. The pollination agent consumed pollen and nectar and left a mass of white eggs on the flower.	