



COLLEGE OF SOCIAL & BEHAVIORAL SCIENCES

Women in Science
& Engineering

The Bio/Diversity Project

Lesson Title: Self-Pollination vs. Cross-Pollination

Teacher: Emma & Zabrina

Grade Level: 6th

Time Teaching: 55 Minutes

This lesson has been adapted from:

https://www.teachervision.com/seeds-pollination/activity-investigating-self-cross-pollination?check_logged_in=1

AZ Science Standard:	6.L2U1.13 • <i>Develop and use models to demonstrate the interdependence of organisms and their environment including biotic and abiotic factors.</i>
Learning Objectives:	• Students will be able to explain the difference between cross-pollination and self-pollination. • Students will be able to describe one way in which we can help conserve pollinators.
Scientist of the Week:	• <i>Eijiro Miyako</i>  •



	• <i>Technological Pollination Researcher</i> • <i>Japan</i> • Helped create tiny drones that can facilitate pollination in a similar way as bees would. • This could be extremely important and positively impactful if the bee population continues to decline.
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Vocabulary		Materials		
● Self-Pollination ● Individuals ● Flower ● Cross-Pollination ● Genetic Variation		- <i>Powerpoint</i> - 30 <i>“Cross-Pollination” and “Self-Pollination” signs</i> - <i>Bird feed</i> - <i>Jumbo popsicle sticks</i> - <i>String</i> - <i>Acrylic paint</i> - <i>Paint brushes</i> - <i>Elmer’s glue</i> - <i>Hot glue guns</i>		
Seasonality: Any seasonality				
<i>Monsoons</i> July-Sept.	<i>Autumn</i> Oct.-Nov.	<i>Winter</i> Dec.- Feb.	<i>Spring</i> Mar.-Apr.	<i>Dry Summer</i> May-June
Guiding Questions:				
● What morphological plant adaptations can be seen as a result of pollination? ● How does self-pollination differ from cross-pollination?				

Engagement/Introductory Activity:

- Students will come in and we will display [this chart](#) that will show the changing amount of beehive populations on a worldwide scale..
 - The following discussion will be a **THINK-PAIR-SHARE**.
 - Ask students what they can infer from the chart. Ask them to be as specific as possible.
 - What do they think the chart is representing? What could the different colors on the chart represent?
- Transition to explain how bees are very important pollinators. They play a very big role in aiding plants who cross-pollinate.

Exploratory Activity:



- Before we begin the activity, students will watch [this video](#) on the projected screen. (Play only from 2:43-4:28)
- We will now be playing a game of “This or That” but with “Self-Pollination or Cross-Pollination”.
- Display the following questions one-by-one on the board through the presentation and ask students whether each one is an example of “Self-Pollination” or “Cross-Pollination” which they will indicate by holding up either their “Cross-Pollination” sign or “Self-Pollination” sign (see materials list).
- Here are the questions:
 1. Pollen grains fall off a stamen and land on a pistil of the same plant. SELF-POLLINATION
 2. Pollen from male flowers of a plant land on the female flowers of a different plant.
CROSS-POLLINATION
 3. Pollen from the stamen of one flower gets stuck on the legs of a bee. The bee then lands on the pistil of a different flower on the same plant. SELF-POLLINATION
 4. Pollen from the male flower of one plant is carried by wind to the female flowers of another plant.
CROSS-POLLINATION
 5. Water carriers pollen from the stamens of one plant to the pistils of a neighboring plant.
CROSS-POLLINATION

Explain:

- Ask students the following questions to ensure they understand the difference between self-pollination and cross-pollination from the information they learned in the previous video and activity.
 - Which form of pollination requires pollinators? Cross-pollination
 - What is animal-based cross pollination called? Zoophily
 - What is **anemophily**? (Cross-pollination by wind) What is **anthropophily**? (Cross-pollination by artificial means)
 - Remind students that the easiest way to tell the difference between the two pollination processes is that **self-pollination** is pollination that occurs within the SAME plant and **cross-pollination** is pollination that takes place between two DIFFERENT plants.

Extension Activity/Questions:

- Students will now have 25-30 minutes to work on the building phase of their action project. The expectation for this activity is that students will have:
 - Finished the construction of their individual bird feeders.
 - Start and hopefully finish the decoration (with paint) of their feeders. The idea with the decoration is that students will incorporate what they have learned about pollinators and colors to best attract birds.

Evaluation Activity:

- Students will have the chance to play [this kahoot](#)
- Here are the questions:
 - How many different types of cross-pollination were mentioned in the video?
 - 3
 - Which type of pollination occurs between flowers of the same plant?
 - Self-pollination
 - What is wind-based cross pollination called? (Think back to the video)
 - Anemophily
 - Self-Pollination is pollination between different flowers of different plants.
 - False
 - Which form of pollination requires the work of pollinators?
 - Cross-pollination
 - Do you all remember our 6 pollinators? Which of the following animals was NOT one of those pollinators?
 - Squirrels



- What is the female part of the flower?
 - Stigma
- Which part of the flower holds the most pollen? (Think of the part that pollinators usually land on)
 - Anther
- If you see a plant with both male and female parts, what kind of pollination(s) can occur?
 - Cross-pollination or self-pollination
- I am done building my bird feeder!
 - TRUE