

POLLINATOR POWER

Grades 5 - 6, Science and Technology

Prepared for Monarch Mayhem 2020

OVERVIEW & PURPOSE

This lesson plan will help students understand the two types of pollination: self-pollination and cross-pollination. It will also serve as an introduction to the idea of genetic diversity within a species.

Estimated time to complete: 45 minutes to 1 hour.

OBJECTIVES

1. Students will understand the importance of both self-pollination and cross-pollination.
2. Students will begin to understand the idea of genetic diversity and its importance within plant and animal species.

MATERIALS NEEDED

1. Bug genes activity sheet.
1. A computer and the PowerPoint presentation.

VERIFICATION

Steps to check for student understanding

1. Students will discuss or write down why the offspring of self-pollinated sunflowers died and the cross-pollinated offspring fared better.
2. Students will complete a genetic inheritance activity.

PRESENTATION

You will have received the PowerPoint presentation 'Pollinator Power' via email. You can also download this at: monarchmayhem.ca/resources. The presentation has been created as a visual aid for this lesson.

Pollination Recap: pollination is the transportation of pollen from the male part of a plant's flower (anther) to the female part (stigma). This helps the plant reproduce and create a new generation of seeds.

There are two types of pollination: self-pollination and cross-pollination. Self-pollination is the transfer of pollen to the stigma **within one plant**. Cross-pollination is the **transfer of pollen from one plant's anther to the stigma of an entirely different plant** of the same species. The plant does not decide which type of pollination to do. Animal pollinators, like bumblebees, the wind or water currents carry the pollen to the stigma.

Genetics are the inherited traits an animal or plant has. Ask students if they look like one of their family members. Maybe they look like a sibling? **Genetic diversity** is the number of different genetic traits within a plant or animal species. It is important to have a large amount of genetic diversity because different traits help plants and animals survive. A low amount of genetic diversity can put plants at a greater risk of disease, weather and other problems.

For example, if Jill planted one sunflower at home and there are no other sunflowers in her area, the sunflower will self-pollinate with the help of pollinators. The sunflower creates seeds which then fall to the ground and the next year Jill will have three sunflowers total.

Jill's friend across town, Jack, planted three sunflowers in his yard the same year as Jill planted one. His sunflowers cross-pollinated and the next year, he had six sunflowers.

The second year is very rainy. This causes a mould to grow on the sunflowers. Jill's sunflowers unfortunately died. Jack's, however, mostly survived.

Activity #1: Discuss in groups (if regulations allow) or write down your thoughts on why Jill's sunflowers died and Jack's didn't? Why might self-pollination be used if the sunflower's offspring died?

Review session with class. The reason that Jill's sunflowers didn't make it but Jack's did is

down to genetic diversity. Jill's sunflower did not have genes that are resistant to the kind of mould that was caused by the rain. Jack's mostly survived because they had more genetic diversity. One or more of the original flowers he planted had a resistance to the mould and this was passed on when it cross-pollinated.

Plants use self-pollination to create a new generation when there are no other plants of the same species in the area. As many plant seeds are carried by the wind, water or by animals, they may be the only plant of that species around.

Activity #2: Hand out the 'Bug Genes' activity and quickly model the activity with the class. Once students have completed the sheet, ask them to consider how each of the traits they selected could either help or hinder the bugs in their daily lives. Those with positive traits are more likely to survive and reproduce, leading them to be more common in the species.

Hand out the pollinator-inspired snacks.