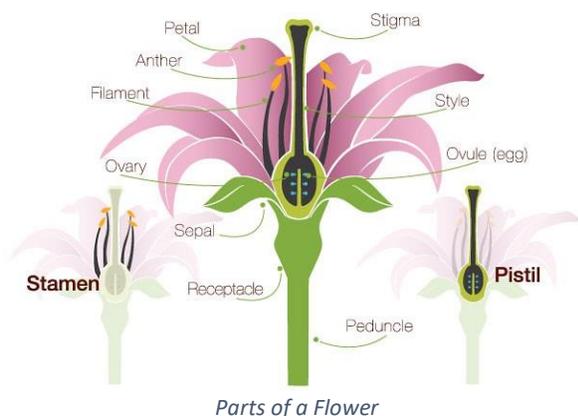


Virtual Monarch and Meadow Month Lesson: What's the Buzz About Pollination?

In this lesson, participants will learn all about how pollinators pollinate.



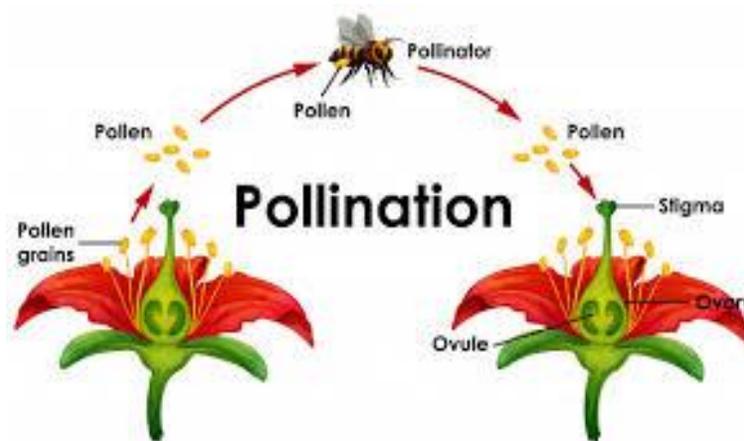
Pollination. It's a word everybody knows, but if you had to take that science test today could you explain what's really going on with the birds and the bees? And why should you care anyway?

In short, pollination is the process of transferring pollen from the male part of a flower, the **anther**, to the female part of the flower, the **stigma**, to fertilize a plant and make **seeds** (*aka* plant reproduction).

The vibrant colors, delicious aromas, and diverse shapes of flowers all play a critical role in attracting not just birds and bees, but butterflies, moths,

wasps, flies, beetles, and other animals to help with the pollination process. These animals are pollination partners and we call them **the pollinators**. A plant can't move pollen on its own, so when these animals land and move about on a plant, they help spread the pollen from the anther to the stigma.

But pollinators aren't visiting flowers just to lend a hand, leg, wing, or proboscis, to help with pollination - they are visiting to forage for food, specifically nectar and pollen. Nectar is the sweet reward of a sugary high-energy drink that plants make to entice an insect to come to their flowers. The male pollen is pure protein, essential food for the foraging insects to take back to their nests and feed their growing larvae.



In this example, a bee is the pollinator for cross pollination

When pollen from a plant's anther is transferred to that same plant's stigma, it is called **self-pollination**. When pollen is moved from one plant to another, it's called **cross-pollination**. Cross-pollination is most common and helps to ensure a diverse gene pool for the plant's offspring. Watch bees pollinating flowers [here](#).

Plants have all kinds of relationships with pollinators. Some pollinators, like bumblebees, are generalists and will help by pollinating a huge variety of flowers. Bumblebees also have the unique ability to **buzz pollinate**, also called **sonication**. Some flower species have evolved to have their pollen kept under wraps, which is a clever evolutionary strategy. Pollen is costly for the plant to produce in terms of energy, so the plant wants to be sure that the pollen produced not be wasted. Plants that have evolved this strategy have **poricidal** anthers, which means the pollen is hidden and packed tightly into the anther.

Few insects besides bumblebees can access this pollen. By contracting their flight muscles, bumblebees produce strong vibrations that result in an explosion of nutritious pollen from the anther. The bee will comb most of these pollen grains from her fur and into the pollen baskets on her hind legs to take back to the growing colony, but a few pollen grains will go on to fertilize one of the next flowers she visits. Honeybees are unable to do this so without bumblebees we could say goodbye to blueberries, tomatoes, eggplants, potatoes, peppers, and cranberries, as well as many other plant species that require this form of pollination. Watch how buzz pollination works [here!](#)



Once pollen enters the stigma of the flower, it travels to the egg in the ovary and fertilizes the plant. If successful, a seed is formed. Seeds contain the genetic information to produce a new plant. In this way, the plant reproduces, and the seed is the beginning stage of a new plant. Seeds can only be produced when pollen is transferred between flowers of the same **species**.

Why should we care about pollinators?

Without pollinators, we would have a lot less food!

One in three bites of food is available only because of cross-pollination by pollinators! It is estimated that the value of pollination services is around 16 billion dollars per year in the U.S. **alone!** We wouldn't have our favorite fruits, vegetables, and nuts without pollinators. Bees also pollinate clover and alfalfa that cattle feed on, making bees critical to the dairy and meat industry. And what would we do without honey for our tea?

Pollination is also critical for maintaining genetic diversity in wild plants as well as fruits and vegetables. They are also important prey resources for other organisms such as migrating birds, praying mantises, and many spiders, which in turn become food for other animals. And as a very species-rich group, pollinators are an important component of our state's biodiversity. New Jersey's pollinators include 300+ species of native bees and thousands of species of butterflies, moths, flies, wasps, ants, and beetles. Honeybees are not actually native to North America but are by far the best-known pollinators.

Pollinators are in decline, so get involved!

In the US, beekeepers have lost about 30% of their colonies every year since 2006, with total annual losses sometimes reaching as high as 42% ([Bee Informed Partnership](#)). Population changes in other insect pollinator species, such as native bee species, flies, butterflies, and beetles have not been as closely tracked. Indeed, there are several hundred-thousand species of pollinators and tracking all of them is not possible. However, surveys have documented disturbing population declines and even local extinctions of select pollinator species across Europe and the US.

You can help pollinators by getting informed, never using pesticides and herbicides in your yards, planting pollinator gardens, conserving resources and fighting climate change. See a complete list of how to help [here](#). Let's save the bees, butterflies, moths, hummingbirds, beetles, wasps, and all the pollinators that sustain the earth and grace our gardens. Where would we "bee" without them?



Home Activities – Plant a garden for pollinators and help count bumblebees that visit.

- Learn how to create a pollinator garden [here](#) and [here](#)
- [Plant Bee-Friendly Flowers](#)
- [Join Bumblebee Watch](#)

Additional Resources

- [Pollination Conservation](#)
- [Buzz Pollination Research 1](#)
- [Buzz Pollination Research 2](#)
- [Pollinator economics](#)
- [Bumblebee Conservation](#)

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