

BACKYARD ECOSYSTEM

POLLINATION

Grades 7-9

A
SCIENCE @ HOME
ACTIVITY



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Flowers: How baby flowers are made

In lesson 1 “Flowers: More than just something pretty to look at”, we learned that flowers have four main components (both male and female), and that the flower is the reproductive part of the plant.

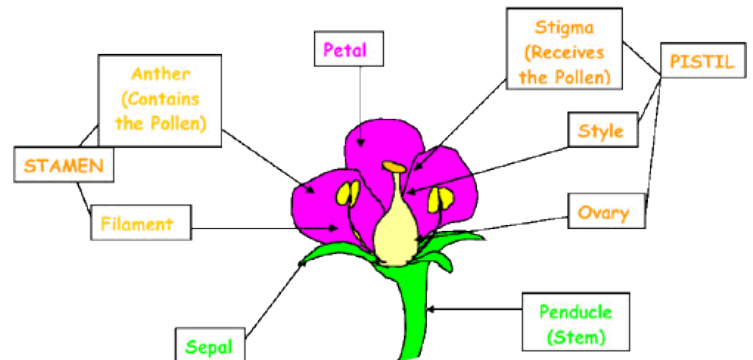
Sepal— exterior parts of a flower that creates a bud around the emerging flower.

Petals — brightly colored, attention attracting for the purpose of attracting pollinators to the flower.

Stamens— the **male** reproductive organ of a flower.

Pistil — the **female** reproductive organ of a flower

Although all flowers are different, they have several attributes and several very different ways they reproduce.



Complete vs. Incomplete Flowers

If a flower has all four of the component parts, it is considered to be a complete flower.

If any one of the components are missing, it is an incomplete flower.

Perfect vs. Imperfect Flowers

The stamen (male organ) and pistil (female organ) are necessary for seed production.

A flower has both of these parts, it is called a perfect flower.

A flower has only one of these reproductive parts, it is considered to be an imperfect flower.

Monoecious vs. Dioecious Flowers

Monoecious plants have imperfect flowers (male and female), on the same plant.

Monoecious have the advantage of being self pollinating.

Dioecious plants have imperfect flowers (male or female) on separate plants.

Dioecious plants must grow near each other to make pollination more likely.

Let's explore more about how plants reproduce

In this lesson we will learn about pollination, which is the moving of pollen to facilitate fertilization. As the reproductive organs of the plant, the flower facilitates the joining of the sperm, contained within pollen, to the ovules — contained in the ovary. The primary purpose of fertilization is to produce seeds that will pass on the traits of the plant to the next generation.

Plants can be successfully fertilized in one of two ways:

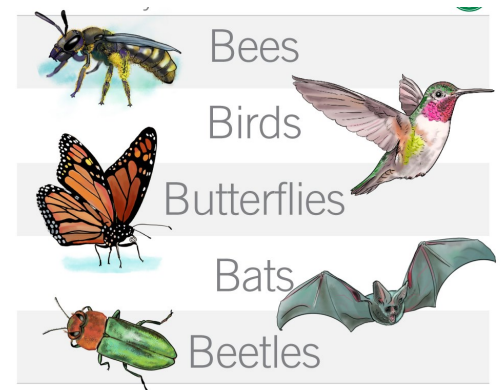
Self-pollinating - the plant can fertilize itself.

Cross-pollinating - the plant needs a vector (a pollinator or the wind) to get the pollen to another flower of the same species.

The role of the pollinator

The flower needs help to reproduce and that's where the pollinators can assist. Although the wind and animals that pick up pollen sticking to their fur are some help, it is the insects and birds that are the greatest pollinators.

To make this relationship work for both the flower and the pollinators they each get something. The flower uses its bright colors, fancy shape and sweet smell to attract the pollinators, it also offers them a treat by providing food (nectar or pollen). After the pollinator visits the flower and gets food it also takes some of the flowers pollen and deposits it with the next flower it visits. If everything goes as planned the second flower now has the pollen (male) of the first and fertilization can occur. The result will be the growth of seeds to eventually become a baby flower.



This bee has filled its pollen sacs and prepares to deliver it to the next destination.

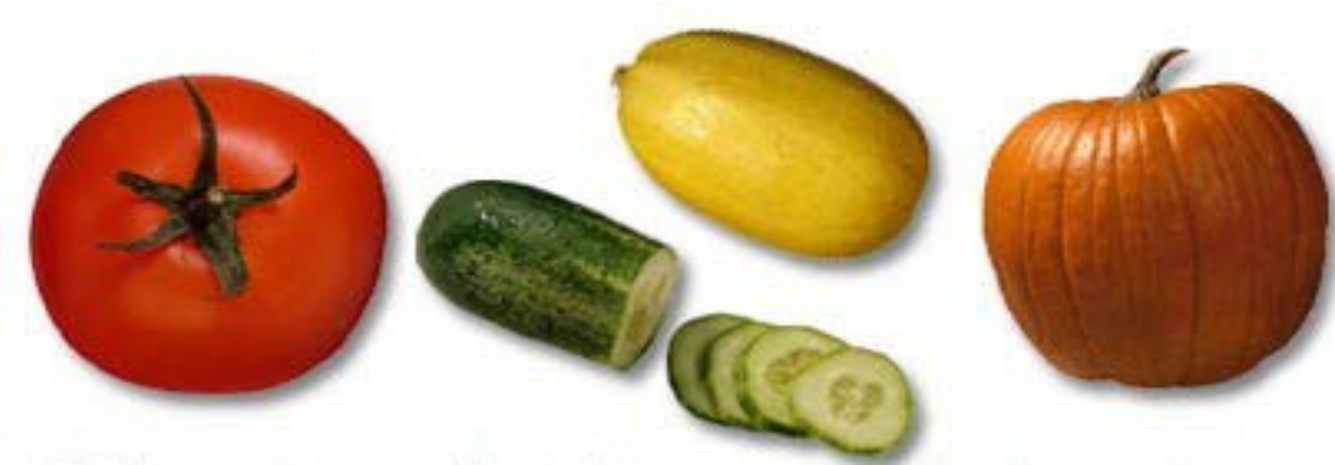
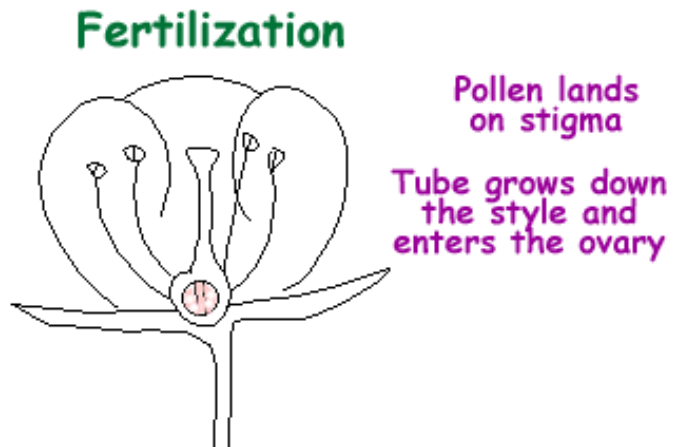


This bee's entire body is coated with the sticky pollen. Which it will drop as it flies from flower to flower.

Pollination of the Flower

Upon arriving on the stigma, pollen will germinate to produce a pollen tube down the style. When it reaches the ovary sac, the pollen tube fertilizes the ovules. At this point, pollination is complete.

The fertilized ovary swells to protect the developing seeds and the flower becomes a fruit. Inside the fruit, the fertilized ovule becomes a seed, which can grow entirely new plant.



Did you realize that all of the above are actually ripened ovaries and the result of successful fertilization? Each contains seeds inside that can produce more plants.

Watch the following Video:

Pollination Video

<https://www.youtube.com/watch?v=SiFaN2xQg5g>

Now it is your turn to become a Pollinator

Materials:

- 3 cupcake liners or small plate
- 3 cotton balls
- 1 cotton swab
- 1 small cup of water
- 3 different powdery substances (kool-aid, sprinkle cheese, flower, sugar, glitter, etc)



Procedure:

- Place one cotton ball in each cupcake liner (or plate).
- Sprinkle a small amount of the 3 powdery substances (1 each) on the 3 cotton balls.
- Dip the tip of the cotton swab in the water and squeeze out as much water as possible.
- Gently rub the cotton swab across one of the cotton balls, slightly picking up the powdery substance.
- Without re-wetting the cotton swab, rub it across all 3 cotton balls.

Observations:

What did you observe happening to the cotton balls? _____

What did each part of this activity represent:

Cotton ball: _____

Cotton swab: _____

Powdery substances: _____

Have you ever noticed your fingers after eating chesse flavored snacks such as Doritos, chees curls, cheese popcorn, etc. ?

What did you see? _____

What happens to anything else you touch? _____

How does this observation relate to politicization? _____



To learn more about Pollination and Botany check out the following Resources:

What is Pollination? (Website)

https://www.fs.fed.us/wildflowers/pollinators/What_is_Pollination/index.shtml

Bumblebee Unlocks a Flower's Hidden Treasure

<https://www.youtube.com/watch?v=SZrTndD1H10>

Pollination: Trading Food for Fertilization

<https://www.youtube.com/watch?v=LiczM-w3V-U>

We would love to see your creativity and hear about your experience with our lessons, so please tag us at James E. Richmond Science Center on Facebook and Twitter.

Thanks for visiting! See you soon!