

Pollination

Pollination is the process by which pollen from the tip of the stamen (called the anther) of a male flower is transferred to the tip of the pistil (called the stigma) of a female flower so that fertilization, and then fruit and seed production, can occur, thus completing the full cycle in the life of a plant. (See Flower Power in Appendix B.)

In a garden, pollination is only necessary for those crops that produce edible fruit or seeds. If we eat the root or leaves of a plant (as with carrots and lettuce) there is no need for pollination in order to achieve a harvest. Crops like cucumbers and tomatoes, that produce edible fruit or seeds, must somehow be pollinated in order to produce a harvest. In nature, pollination is most often aided by the action of wind and insects.

Most flowers are bisexual, that is, they have stamens and pistils in the same blossom. (These are called "perfect" flowers.) Pollination occurs easily in perfect flowers since their parts are arranged to enable pollen to transfer easily. The slightest touch or air movement around most perfect flowers will lead to pollination. Indoor garden crops that have perfect flowers and require only slight movement to pollinate themselves include tomatoes, peppers, eggplant, peas, and beans.

Some species, such as cucumbers and squash, have separate male and female blossoms, called "imperfect" flowers. You can recognize the female blossoms by the miniature fruit (ovary) that develops behind them, even before pollination occurs.

In your indoor garden, cucumbers are the only crop that you should pollinate by hand to simulate the role of bees.

Pollinating Cucumbers Indoors

Since there are (hopefully!) no bees in your classroom to carry the pollen from the male to the female flowers of your cucumbers, you and the children must fill that role. To do this, you'll need to distinguish the male flower from the female flower. As the plants flower, you will notice that some of the blossoms have a miniature fruit (ovary) at the base. These are the female flowers.

Although this miniature fruit looks like the beginning of a cucumber, it won't continue to develop unless it's pollinated. Male flowers are generally the first to appear and they do so in greater numbers than the female flowers. Male flowers don't have a miniature fruit at the base of the blossom. Once you have some female flowers, you can try your hand at pollination.

Using a small paintbrush, carefully collect the yellow pollen grains from the tip of the stamen (the anther) on the male flower, and gently touch the brush to the tip of the pistil (the stigma) of the female flower. As long as some of the yellow pollen is transferred to the female, you're likely to achieve pollination. Female flowers that have not been pollinated will die.



Pollination Adaptations

An exciting concept for children is that the primary "purpose" in the

life of a flower is to become pollinated.

Flowers all have adaptations such as color, size, shape, fragrance, etc., to attract bees and other pollinators (or assure pollination by wind or other means). The pollinator uses the sweet nectar and pollen to make food for itself and its young. While collecting pollen, the bee or other pollinator inadvertently transfers pollen from one flower to another.

Many flowers (such as grasses) are small and inconspicuous, while others (cucumbers, roses, etc.) are showy, bright, and fragrant. Flowers that are wind-pollinated need to be light and airy while flowers that need to attract insects must be bright, fragrant, and flamboyant!

Have your students study flowers from outdoors, from home, and from the classroom garden. Use magnifying glasses to examine them and try to identify some of the flower parts. (Not all flowers will have all of the parts shown in the diagram in Appendix B.) Feel some stigmas to see if they are sticky and have children guess why this might be. Ask students to describe the characteristics of flowers that assist in pollination.

