

Build a Flower – Build a Bee

Introduction

Bees and flowers have existed together a very long time on earth, and have special structures that enable them to work so well as a team.

Flowers need bees for pollination. To ensure that pollination occurs flowers have special colours and smells to attract bees. When bees visit a flower they collect pollen. This helps transfer pollen between flowers, helping to fertilise the plants. When this happens, the plants are able to produce seeds and grow new plants, increasing the plants population.

Bees need flowers for pollen. Bees use pollen as a food source. By finding the best sources of pollen, bees can collect as much as they can carry to help supply the hive with food. Some bees also store enough pollen to get the hive through the winter when there is little or no pollen available.

Procedures:

To construct the flower:

- Have students select a colour of tissue paper for their flower. Each student needs enough tissue paper to cut out 15 – 20 4 cm squares of tissue paper.
- Once students select their tissue paper have them cut the tissue into 15 – 20 4 cm squares.
- As students are cutting out their squares have them stack the tissue paper in neat piles so that the edges are all aligned.
- Next, fold the tissue in a “fan” style: fold one edge forward about 1 cm, then turn the pile over and fold back 1 cm. Repeat this until the pile is completely folded.
- When the pile is fully folded in the “fan” style, secure the pile in the centre with a pipe cleaner, leaving one end of the pipe cleaner long, as a “stem.”
- Tease the layers of tissue apart and up toward the centre, creating the “petals” of the flower.
- In the centre of the flower, attach a second and third pipe cleaner. These should be shorter than the pipe cleaner used to make the flower stem. One pipe cleaner will represent the stamen and the other will serve as the pistil. To make the anthers of the stamen, curl the ends of the pipe cleaner. To make the pistil twist the two ends of the third pipe cleaner together to represent the style. Next fold the ends of the style over to represent the stigma.
- Lightly dust the anthers with baby powder to represent pollen.
- Older students could then make labels of the flower parts e.g. stigma, stamen, style, petal, stem, sepal and add an anther and filament to their stamen. They could write a description of the parts function.
- After the completion of the activity these could be displayed on the wall.

To construct the bees

- Students need to select one material for building their bee. They can choose from the plain printed cotton, felt, or cotton balls. Different materials will be used to demonstrate which material is best for collecting pollen. Remember plain fabric represents no hair, felted fabric represents few hairs, and the cotton balls represent many hairs.
- Before students start making their bee, explain to the class that each bee must have the following:
 - a. A head, a thorax and an abdomen
 - b. 6 legs
 - c. Two antennae
 - d. A straw attached somewhere to the bee as a “handle.”
- When students are finished building both their flower and bee, it should look like the picture below.



- Labels of parts and a description of their function could be added.

As a Class

- When students are finished building their bees, divide the class into two groups.
- Group one represents the flowers.
- Group two represents the bees.
- Using the straw “handle” of the bee, have the bee group simulate the bee landing on the baby powder-dusted flowers.
- Next have the students in the bee group move to the stigma of another flower to demonstrate pollen transfer.
- Students need to assess the amount of pollen transferred both to the bee from the first flower, and then from the bee to the second flower.
- Students need to determine which bee material collected the most pollen from the flower.
- Have the students record their observations.
- Students should switch roles and perform the simulations again using the different bees and different flowers.
- Have students record their observations from the second round of simulations.

Extension Questions

Following both rounds of simulations, discuss the following questions as a class.

1. Are bees attracted to all flowers, or are bees attracted to a specific shape, colour, or fragrance?
2. Which part of the flower is responsible for pollen production? What part of the plant did the bee need to touch to collect the pollen? Is this the male or female reproductive part of the flower?
2. Which material collected the least amount of pollen from the flower?
3. Which material transferred the most pollen from the bee to the second flower?
4. What part of the bee is best for collecting and transferring pollen?

Adapted from

http://www.toshiba.com/taf/common/docs/Bees_and_Flowers.pdf