

How Plants Communicate!

Make a Human Flower

Essential Questions:

What are the parts of a flower?

How does a flower attract animal pollinators?

How do traits, such as height, taste, and color, pass from one generation of plants to another generation?

At a Glance

Learners take on roles of different flower parts to make a human flower and then simulate pollination by bees.

Background Information

Read through the activity for accompanying information to tell learners. Also review *Human Cameras* and *Parts of a Flower* for further information.

Procedure:

Part A: Human Flower

1. Tell students that they will each take on a different role to 'make' a human flower. Make two flowers at one time so they may cross-pollinate in Part B of the activity. Have them stand somewhat close together (about 2-3 feet apart).
2. Have one student raise their arms to represent the pistil. This student chants "sticky, sticky, sticky" to demonstrate the sticky stigma which collects pollen at the top of the pistil.
3. Pick 2-4 volunteers to represent stamen. They are to encircle the pistil and hold their fists in the air to represent the pollen-bearing anthers at the tips of the stamen. These students chant "pollen, pollen, pollen."
4. A group of 4-6 students can encircle the stamen to represent the petals. Facing outward, these students act very attractive by waving, smiling, and saying nice things to passing birds, bees, and other insects. They may also pretend to waft their scent towards the pollinators to attract them over.
5. Finally, a last group of 4-6 students can represent the sepals that protect the flower bud before opening. They can squat down outside the petals and chant, "I'll protect you." They may also put up their fists as if they are boxing to ward off enemies.

Part B: How Plants Communicate!

1. Go over the parts of the flowers the learners have just made, focusing on reproduction. Remind learners that pollen is like a little packet of information that goes from one plant to another plant. The information in the pollen determines what traits or characteristics the seed and resulting offspring plant will have.
2. Explain that these two 'human' flowers are the same type of plant even though they look different. Each plant has different characteristics or traits. One plant knows how to grow tall. Ask why this is important and place the "grow tall" pollen on one learner 'stigma' of one flower. The other plant knows how to taste yucky to pests. Ask why this is important and place the "tastes yucky to pests" pollen on a 'stigma' of the other flower.

Location: Outdoors or in classroom with plenty of space.

Objectives: Learners will

- 1) Identify the different parts of a flower.
- 2) explain how flowers are pollinated by bees.
- 3) describe how traits such as height, taste, and color pass from one generation of plants to another generation.

Skills: communication, role-playing, creative thinking, interpretation

Supplies:

- pieces of pollen messages (plant traits) – yellow paper with messages like "grows tall" and "tastes yucky to pests"
- tape

Subjects: science

Time: 15-20 min

3. Tell the learners that the plants want to exchange their pollen information so they can create the best seed ever – one that can grow tall and taste yucky to pests.
4. Ask two of the ‘stigmas’ to exchange their pollen, but before they can do it, remind them that their roots are holding the flower to the ground since they are plants. How else can they exchange their pollen?
5. If you are lucky, one of the children will try throwing the pollen to the other child but it will fall short. Point out that this tactic did not work. But what if the plant had lots of pollen to throw? Take this opportunity to tell the children about plants that use the wind to carry pollen like pines, oaks, and grasses. It takes a lot of pollen to do it this way and most of it falls on our cars, sidewalks, roads, etc. These two plants only have a little pollen, so how can they exchange pollen and genetic information?
6. Answer: use bees or other insects. Get 1-2 volunteers to be bees and have him/her fly off to another part of the room. They may carry ‘bee puppets’ to represent this pollinator.
7. Point out that now there are bees to carry the pollen, but bees don't work for free. What are the plants going to offer him/her for their work? Answer: nectar.
8. The bee now has a reason to visit the flowers, but how does he/she know where it is? There are two answers to this question.
 - First: smell- have students waft their scent towards the bees with their hands (or you may spray air freshener at the petals’ feet to simulate flower scent)
 - Second: bright colors; point out that attractive, bright colors on a flower are like advertisements that pollinators will find nectar there. The petals are to act very attractive by waving, smiling, and saying nice things.
9. Now the bees know exactly where the nectar is, so he/she goes after it. While sipping the nectar from inside the flower, the bee bumps into the anther (male part) that is covered with pollen and gets some on his/her back. Tell the bee students to go to the stamen and "collect pollen" by reaching up and touching the fists/‘anthers’ of the students representing the stamen. While there, stick the construction paper pollen message to the back of the ‘bee’. Then the ‘bee’ flies away to the next flower. While at the next flower, the bee again touches the anther and gets pollen on his back, but he/she also reaches up and touches the stigma of the pistil and deposits the pollen message (paper) from the first flower. If only using one bee, have him/her fly back to the first flower again to leave some of the pollen from the second flower. If using two or multiple bees, each bee may pass on an individual trait between the flowers. Now the flowers have exchanged their pollen.
10. Be sure to leave one or two pieces of pollen on the bee. When the bee returns to the hive, he will make honey from some of the nectar that he drank. The extra pollen will be removed and mixed with honey to feed to the larvae (young bees). It is very nutritious. You can often see all the extra pollen a bee has collected because they scrape it into large masses on their back legs. These are called "pollen baskets".
11. While the ‘flowers’ disassemble, ask, "Now that the flower has been pollinated, does it need the petals and nectar any more?" Why not? Now the plant can make a seed. What else might the plant make around the seed? Answer – a fruit.



Discussion/Assessment:

What is the anatomy of a flower? What does each flower part do?

How are flower traits passed between flowers?

How do bees pollinate flowers?