

Pollination Parade



Objective:

Students will explore the relationship between flowers and their pollinators.

Grade Level: 4-6

Groupings: Pairs or small groups

Materials: Several different flowers; *Flower Description Cards* and *Pollinator Profile Cards* (see pages 235 - 36); collection of miscellaneous materials for constructing flowers such as paper plates, drinking straws, toilet paper tubes, crepe paper, assorted scents and flavored extracts, toothpicks, play dough, pipe cleaners, cotton balls, scraps of felt, wire floral stems, and string.

Time Allotment: 30 minutes

Extension:

a. Have the students conduct a pollination survey. Have them observe a flower over time, noting the different types and behavior of pollinators that visit it.

Directions:

This activity works best if the students are familiar with the material presented in *Flower Power* (page 227).

1. Bring in several flowers of different shapes and colors. Ask the students to vote for their favorite flower. When the votes are in, explain that not everyone voted for the same flower as different people have different preferences. Different insects and other plant visitors have flower preferences, too.
2. Explain to the class that the purpose of a flower in the life of a plant is to reproduce the plant. In order to do that, pollen from one flower must be carried to other flowers and vice versa. The pollen fertilizes the pistil of the plant, producing fertile seeds. These seeds can then grow into new plants. Introduce the class to the idea that different flowers are pollinated in different ways. Explain that flowers have evolved specialized parts, shapes, colors, scents, and other characteristics expressly to attract **pollinators** — animals, birds, and insects that spread pollen from flower to flower. The class will construct their own flowers that are adapted in different ways to attract pollinators. Later they will play the role of the various pollinators.
3. Divide the students into pairs or groups. Give each group a *Flower Description Card*. Using the materials provided, have the students make a three-dimensional flower that meets the requirements detailed on their card. Stress that the flower should have all the basic flower parts unless the description states otherwise.
4. Place the finished flowers with their description cards in a central location in the classroom. Provide time for all the students to observe the flowers.





POLLINATION PARTNERS

Flowers have been 'courting' pollinators for a long time. They have evolved specific colors, shapes, nectars and perfumes to attract them. The most efficient pollinators have been rewarded with a flower designed just for them. Petals have evolved into flat landing platform shapes for bees; foul odors are emitted to lure carrion beetles and flies; and nectar is hidden deep inside long flower tubes where only hummingbirds, moths, or butterflies can reach it. Certain orchids go as far as resembling the females of certain species of bees and wasps, even producing a scent that mimics the mating pheromone. Male bees and wasps are attracted and attempt to mate with the flower, pollinating it in the process. One of the most amazing examples of this coevolution of flowers and pollinators is the yucca plant and yucca moth. The female moth only visits yucca flowers, and at each one she rolls up a large ball of pollen. She carries this pollen ball to another yucca flower and deposits it on the stigma, thereby insuring pollination and seed production. She then lays her eggs in the ovary of this flower, insuring a food source for her hatching larvae 'which emerge just as the seeds are ripening!' It is estimated the larvae only eat about 20% of the seeds before they chew their way out of the ovary and are on their own.

Directions: (continued)

5. Pass *Pollinator Profile Cards* to the groups. Have the students read over their card carefully. Explain that each group will now take on the role of the pollinator described on their card. Review the flower descriptions, and ask the pollinators to choose the one flower that best suits their needs. When you say "Go," the pollinators in each group fly, buzz, or crawl to the flower that is best adapted for pollination by them. Review their choices.

6. Show the students examples or pictures of flowers that are pollinated by the various pollinators and compare them to the flowers they made.

POLLINATORS and their FLOWERS

Bat: Organ Pipe Cactus (*Stenocereus*), Kapok tree (*Ceiba*), Sausage tree (*Keiskeia*), Calabash tree (*Crescentia*).

Bee: Marsh Marigold (*Callitha palustris*), Blue Flag (*Iris*), Foxglove (*Digitalis*).

Butterfly: Wild Blue Phlox (*Phlox*), Daylily (*Heimerocallis*), Wild Geranium (*Geranium*).

Carrion fly: Stinking Benjamin (*Trillium*), Skunk cabbage (*Symplocarpus foetidus*), Carrion flower (*Scapelia*).

Hummingbird: Cardinal flower (*Lobelia cardinalis*), Red columbine (*Aquilegia canadensis*), Fuschia, Banana.

Mosquito: Small flowered orchid (*Habenaria elegans*).

Moth: Spanish Bayonet or Yucca (*Yucca*), Tobacco (*Nicotiana*), Evening Primrose (*Oenothera*).

Wind: Paper Birch (*Betula*), Cottonwood (*Populus*), Oak (*Quercus*), and many other temperate trees, also grasses and sedges.

Note: Each pollinator has a specific flower type that it prefers, but it may visit and pollinate many different types of flowers.

Flower Description Cards

1. I am a bright red flower shaped like a long tube fringed with tiny petals. Hidden deep in the tube is lots of nectar. I am very showy and stand out in a crowd, but I have no scent.

2. I am a bright blue, sweet smelling flower. I am tubular in shape with five flat petals on the top. Peek inside: I am full of nectar.

3. I am a white flower. I look like a bell with five zigzag petals on top and nectar hidden inside. I have a very strong, pleasant odor that I emit after sunset. Ahhhh!

4. We are a cluster of tiny white star-shaped flowers with nectar and a little pollen.

5. I am a dark maroon flower with three petals. My color has been compared to red meat. Don't get too close because I smell bad, as if I were rotting. Yuck!

6. I am a bright yellow flower with petals spread open wide. They make a nice landing platform so it is easy to drop in for a visit. Follow the racing stripes on my petals to my nectar supply. Watch out for my anthers, they might dust you with pollen.

7. I am a huge, white, funnel-shaped flower on a thick, strong stalk. I smell very sweet and spicy and have lots and lots of nectar and nutritious pollen.

8. We are small green flowers. Nothing fancy, no petals, no sepals, no scent, just anthers full of pollen. We hang around on long stems and dangle in the breeze.

Answers: 1. *Cardinal flower, hummingbird pollinator.* 2. *Wild blue phlox, butterfly pollinator.*
3. *Yucca, moth pollinator.* 4. *Small flowered orchid, mosquito pollinator.*
5. *Stinking Benjamin, carrion fly pollinator.* 6. *Marsh marigold, bee pollinator.* 7. *Organ pipe cactus, bat pollinator.* 8. *Paper birch tree flowers, wind pollinator.*

Pollinator Profile Cards

I am a honeybee. I can't see red, but how I love those bright flashy flowers with distinctive patterns on the petals! People often miss the pattern because they can't see like a bee. Just shine an ultraviolet light on that flower and you'll see it as I do. A tisket a tasket, I love to gather lots of pollen in the 'baskets' on my legs.

I am a hummingbird. Red is my favorite color. Give me a flower with a long tube full of nectar. Don't bother with fancy perfume, because I can't smell a thing.

I am the wind. I don't care much about how a flower looks or smells. I just like to blow pollen about. Whoosh!

I am a carrion fly. I love smelly things, like dead fish or rotting meat. Yum!

I am a little male mosquito. I look for tiny light-colored flowers about my size when gathering nectar.

I am a bat. I have a big appetite, so give me a flower with plenty of nectar and pollen. I am on the lookout for light-colored flowers with strong, sweet and spicy smells, as those flowers are easy to find at night

I am a butterfly. Give me a bright-colored flower that stands out in a crowd. I just unroll my long drinking-straw tongue and sip nectar.

I am a moth. I like flowers that are light in color and have a strong, sweet smell as they are easier to find if you fly by night. My long tongue can find and drink up the hidden nectar.