Pollinator Adaptations

Adapted from: Life Lab "Garden Pollinators" unit

Overview: Students will learn about pollinators and their adaptations, and match flowers to the kinds of pollinators they attract. Students will also observe different shaped flowers in the garden and the animals that visit them.

Subject area: Science

Grade level: 2nd

Next Generation Science Standards:
2-LS4 Biological Evolution: Unity and Diversity

- **2.LS4.1** Make observations of plants and animals to compare the diversity of life in different habitats.

Objectives: Students will be able to observe how flowers and their pollinators have adapted to meet each other's needs.

Prep time: 20 minutes

Lesson time: 30 minutes

Teacher Background: Bees travel incredible distances to and from flowers to obtain nectar and produce honey for their young, and in so doing, they unintentionally pollinate flowers as well. Fun fact for students: Can you guess how many trips bees have to make to gather enough honey to fill a 12 oz. jar? It takes 80,000 trips, or a journey equivalent to going around the world twice!

Over millions of years, flowers have developed scents, colors, markings and shapes to attract certain pollinators, and certain pollinators have developed characteristics such as long tongues or beaks that enable them to reach the nectar in differently shaped flowers. Today, there are flowers that attract butterflies and moths, hummingbirds, beetles, flies, and even bats.

A flower's shape, size, color, and fragrance will determine what kind of insect, bird or bat will pollinate it. Although many flowers attract a variety of pollinators, some are very specialized and depend on certain types of birds, bats, or insects. Conversely, some insects, birds, and bats depend on certain flowers for food. Some flowers which are very nondescript are pollinated by wind or water.

Materials needed:

- Pollinator and Flower Cards (attached)
- Magnifying lenses – one per student

Space needed: School Garden

Staff needed: 1

Preparation steps:

1. Print, cut, and laminate the pollinator and flower cards
2. Identify blooming flowers in the school garden. Make a note of what type of pollinators they might attract to use as a discussion point.

Discussion: Today we're going to learn about pollinators and how they have adapted to certain types of garden plants. Explain or review what a pollinator is and what pollination means (the fertilization process of a plant which leads to production of fruit or seed).

Ask the students:

- *How do you think most plants are pollinated?* (Most are pollinated by a variety of animal visitors; some are pollinated by wind and water.)
- *How do you think flowers attract animal pollinators?* (By being colorful, their size, shape, or having an attractive fragrance.)
- *What are the benefits for the animals? What are they for the plants?*
- *What does adapt mean? Do you think different pollinators have adapted to pollinate different plants in the garden?*

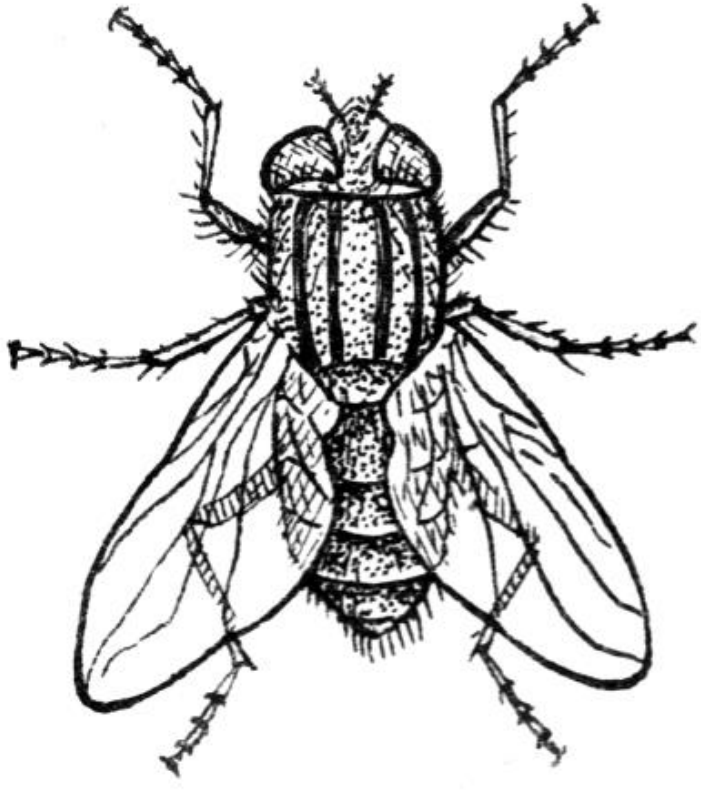
Presentation steps:

1. Divide students into small groups (2-4 per group is ideal) and give each group one of the pollinator cards. Ask each group to discuss what kind of flowers the pollinator on their card is likely to go to.
2. Bring the groups back together. Have each small group share the information on their card with the whole class.
3. Hold up the laminated flower cards one at a time and ask the class to predict who or what pollinates the flower. Remember that there is often not only one answer. Flowers often have a variety of different pollinators. Some flowers are pollinated by both wind and visiting animals. Review the pollinator cards to help students identify the pollinators for each flower.
4. Distribute magnifying lenses and in small groups ask the students to examine flowers in the garden and predict what kind of pollinators they might attract. In doing so, they should look carefully at each flower for color, markings, small hairs, hidden nectar tubes, etc. They should also use their sense of smell and note if the flower is upright or hanging down.
5. Ask students to observe a flower for a few minutes to see if any pollinators visit it. Were their predictions correct?

Conclusion: Ask students the following questions. *What interactions did you see between the flowers and their pollinators? How do you think flowers and pollinators became adapted to help each other? What might happen if a plant had only one type of pollinator, and that species disappeared? What would happen to an animal that depended on one flower for its source of nectar or pollen, and that plant disappeared? What can we do to encourage more pollinators in our area?*

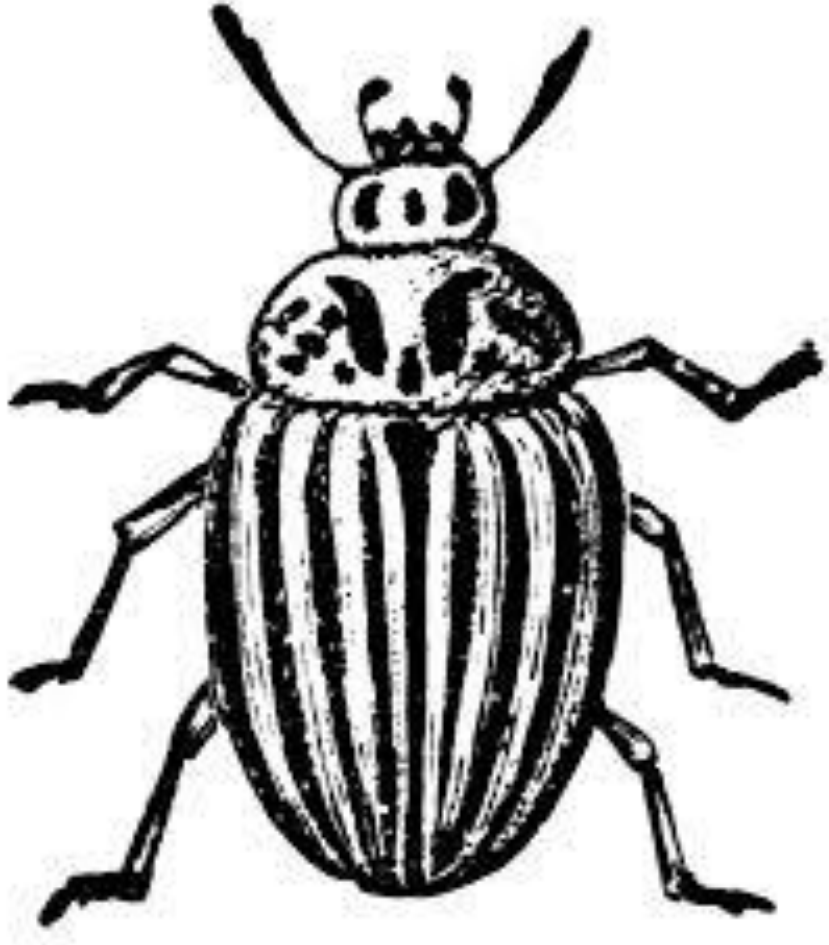
Moths: Moths pollinate sweet-smelling white or yellow flowers because these flowers are easy to find at night.

Birds: Birds, such as hummingbirds, pollinate flowers that are bright red or yellow, and that have a long tube-like shape. The flowers pollinated by birds also tend to have very little scent.

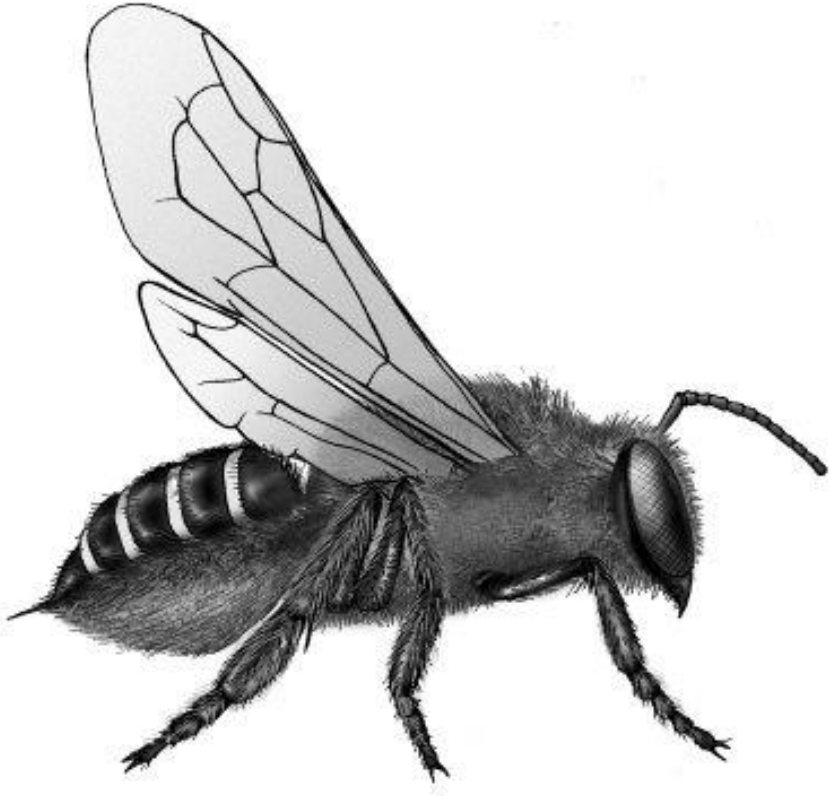


Flies: Flies pollinate reddish flowers that smell like rotten meat.

Butterflies: Butterflies pollinate brightly-colored, sweet-smelling flowers.



Beetles: Beetles pollinate small, white or light green flowers that don’t smell strongly and hang down near the ground.



Bees: Bees like to pollinate flowers that smell sweet and are bright yellow or blue.

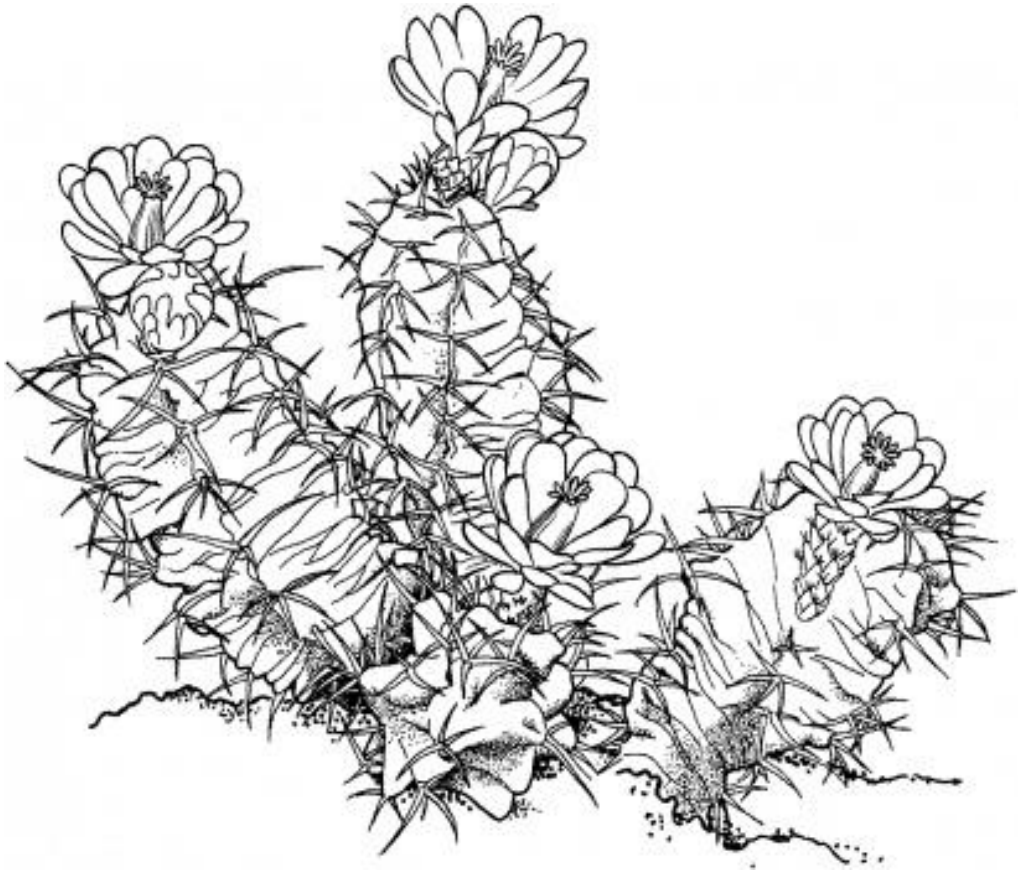
Bats: Bats pollinate large, sweet-smelling white flowers that bloom at night. Bats pollinate many tropical and desert plants.

Wind and Water: Wind and water pollinate, too! Wind carries pollen through the air. Some plants like corn and wheat have special parts made for catching pollen in the air. Pollen can also float in water from one flower to another.

These flowers are tiny and have no smell.

These white flowers bloom at night and smell sweet.

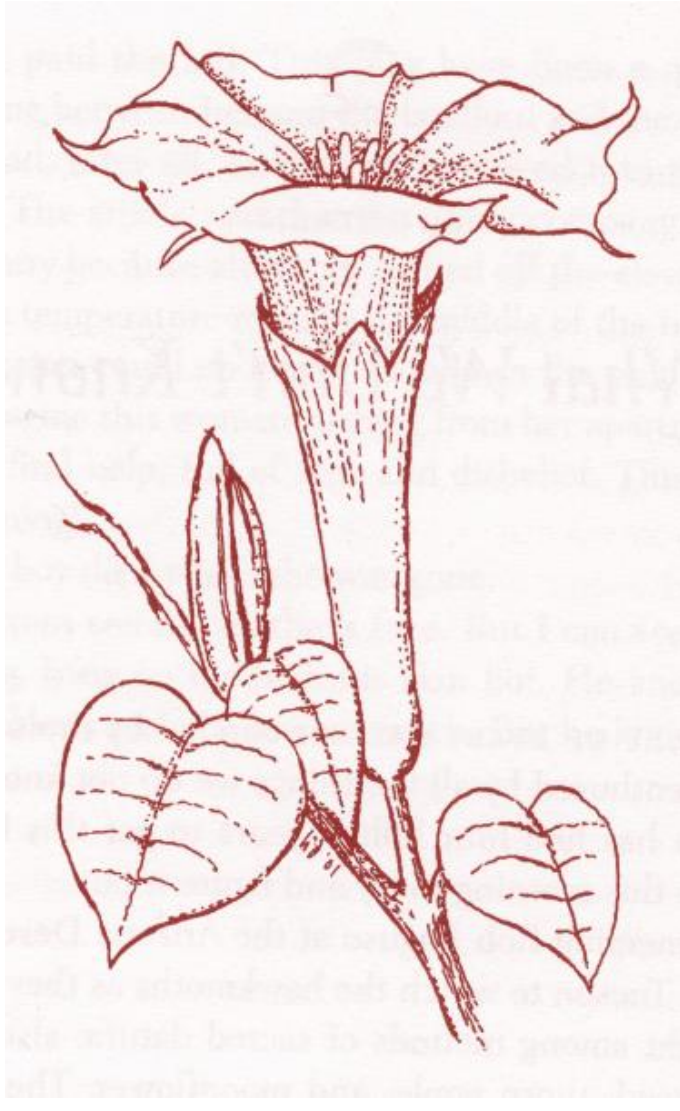
These blue flowers smell sweet.



This cactus flower blooms at night and smells sweet.

This reddish flower stinks!

These colorful orange flowers have a sweet smell.



These bright red flowers have no smell.

These small white flowers are only a few inches tall and have no smell.