



GRADE 6



COAST ^{TO} CACTUS

IN SOUTHERN CALIFORNIA

Curriculum and Lesson Plan Resource Guide



theNAT
SAN DIEGO NATURAL HISTORY MUSEUM



Grade 6 Flower Pollination Adaptations

Essential Question

What adaptations do flowers have that make them attract certain pollinators?

Flowers come in lots of different shapes. Some flowers are shaped so that many different types of pollinators visit them, but others have special shapes so that only certain types of pollinators visit. Pollinators can include bees, moths, butterflies, hummingbirds, and even some bats.



Activity: Design a Flower for a Pollinator

In this activity students will design a flower using observations about corresponding pollinators.

Materials

- Printed pollinator information cards
- Printed flower diagram
- Pipe cleaners (chenille stems)
- Tissue paper
- Assortment of cardstock, toilet paper rolls, clay or Crayola Model Magic, egg cartons, paper cups, and construction paper
- Scissors
- Drawing tools

This activity is best done by students working individually before or after a visit to the *Coast to Cactus in Southern California* exhibition. (See page 2 for activity instructions.)

Design a Flower for a Pollinator

Advance Preparation

- Read through the activity instructions.
- Print pollinator information cards. Each student should receive one card for each pollinator.
- Gather other materials.

Activity

1. Pass out the pollinator card to your students. Let your students know that all of these animals are pollinators. They visit the flowers of different plants to feed on nectar or collect pollen. While moving from flower to flower, these animals carry pollen, helping to pollinate flowers. Each pollinator has special characteristics. Ask your students to pay attention to the shape of the pollinators' faces and bodies, how they move around, and how they sense their surroundings.
2. Have students look at the pollinator information cards and flower diagram. Students can then start drawing the designs for their flowers. Ask them to think about the color, shape and size of each flower.
3. Have your students share their preliminary designs. Bowl-shaped flowers are accessible to most insects. Long tubular flowers might be more accessible to bats with long tongues or hummingbirds with long beaks.
4. Have your students create their flowers three-dimensionally using the remaining assorted materials. They should use their drawings as a design template for the flower model.
5. Students should write a brief description stating how the animal is attracted to, and how it feeds on, the flower.
6. Have your students share their models and compare the designs.

NGSS Alignment for Grade 6

Performance expectation: MS-ETS1-1, MS-ETS1-4

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Asking Questions and Defining Problems Developing and Using Models	ETS1.A: Defining and Delimiting Engineering Problems ETS1.B: Developing Possible Solutions	Cause and Effect Relationships

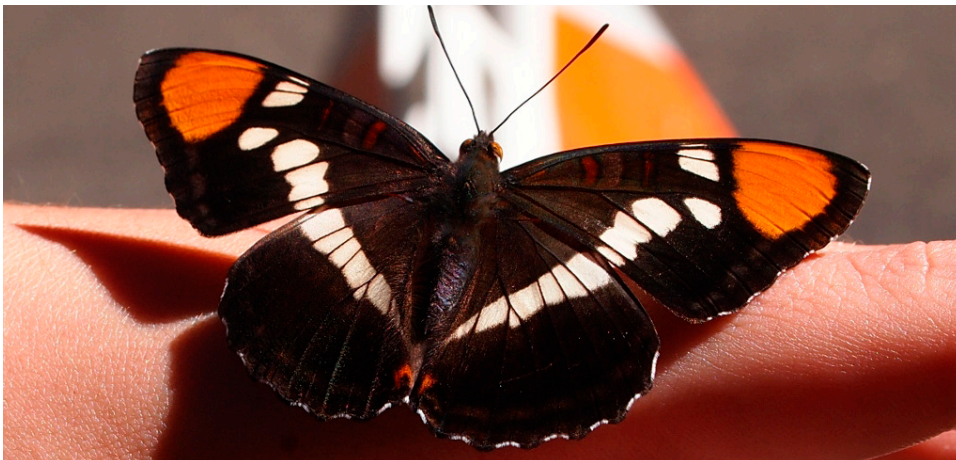
Interdisciplinary Common Core Connections: RST.6-8.1, RST.6-8.9, WHST.6-8.8, SL.8.5

Extension

Draw three terms out of a hat. Terms can include: beak, proboscis, antenna, compound eyes, furry body, feathers, nocturnal, diurnal, flies. Have students design an animal pollinator based on those terms. Draw the new kind of pollinator and the flower that it pollinates.

What will they learn?

During this activity students learn that flowers have adapted to attract specific animals to help pollinate them. Students create a design plan using observations about different animal pollinators. Using their design plans, students create models of their designs. Students share out their ideas and defend their design for each pollinator.



Additional Resources

- Visit the *Explore the Region from Coast to Cactus* website to learn more about the different habitats in the southern California region. You can find more information about desert plant adaptations by visiting **coasttocactus.sdnhm.org**.
- Check out a specimen from our Nature to You Loan Library. Specimens related to this lesson include: Costa's Hummingbird, Sphinx Moth, butterflies. For more information visit **sdnat.org/specimenssearch** or contact the Loan Library at **loanprogram@sdnhm.org** or 619.255.0236.
- Visit the San Diego Natural History Museum and explore our *Coast to Cactus in Southern California* exhibition. San Diego is known for its incredibly diverse terrain, ranging from the beaches and chaparral near the coast, to the mountains and the desert farther afield. Using specimens from the Museum's scientific collections, alongside immersive environments, hands-on exhibits, live animals, and innovative media, *Coast to Cactus in Southern California* illustrates that richness by taking visitors on a journey through these habitats to explore the plants and animals that live in them.

Key Words

Pollinator

Animals that pollinate such as birds, bees, bats, butterflies, moths, beetles, or other animals.

Pollination

To give a plant pollen from another plant of the same kind so that seeds can be produced.

Adaptation

Something a plant or animal has that makes it better able to live in a particular place or situation.

Pollinators

Name: _____

Creosote Leaf-cutting Bee

Trachusa larreae

Pollen from the yellow flowers of a Creosote Bush is the only food source for 22 species of bee (including the Creosote Leaf-cutting Bee).



Yucca Moth

Tegeticula mojavella

The Yucca Moth is the Mojave Yucca plant's only pollinator. Without a visit from this moth, the plant can't reproduce. Fortunately, the moth needs the plant, too. She lays her eggs in its flowers so her larvae can feed on its developing fruit.



Costa's Hummingbird

Calypte costae

Ocotillo flowers offer nectar to Costa's Hummingbird during its nesting season. The birds nest in the desert in spring while the blooms last, then migrate to cooler climates in summer.



White-lined Sphinx Moth

Hyles lineata

Sphinx Moths visit Desert Sand-verbena or Dune Evening-primrose to feed on these flowers' nectar. Then birds drop by to eat the Sphinx Moths.



Pollinators

Mature Flower

