

# UC Santa Barbara

## Educational Materials

### Title

Pollination Lesson

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# CCBER: Plant Pollinators

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## Next Generation Science Standards

2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]

3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. [Clarification Statement: Changes organisms go through during their life form a pattern.] [Assessment Boundary: Assessment of plant life cycles is limited to those of flowering plants. Assessment does not include details of human reproduction.]

3-LS4-2. Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. [Clarification Statement: Examples of cause and effect relationships could be plants that have larger thorns than other plants may be less likely to be eaten by predators; and, animals that have better camouflage coloration than other animals may be more likely to survive and therefore more likely to leave offspring.]

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin.] [Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.]

## Lesson Plan: Plant Pollinators

**Objective:** Students will understand the concept of pollination and gain a perspective on the relationship between flower morphology and pollinating animals.

**Materials:** Collect a diverse array of fresh flowers, insect specimens (or other animals, humming bird, etc.), dissecting microscope, pollinator photo matching game

**Preparation:** Set up a dissecting scope with examples of pollen grains and have insect specimens ready to be viewed.

**Introduction:** Ask students: Why are there so many different looking flowers? *Flowering plants have evolved many adaptations to assist pollination and have co-evolved alongside the diverse groups of animals that pollinate them. What is pollination? Pollination is the process by which pollen is carried (by wind, water, or animal) from the anther (male) to the stigma (female). Pollination is a necessary step in the sexual reproduction of flowering plants. Flowers have evolved many characteristics that help to ensure pollination occurs. Some of those characteristics include; shapes, colors, patterns, odors, and even sweet nectars to attract pollinators. Flowers and pollinators have co-evolved to have special adaptations and unique symbiotic relationships.*

**Procedure:** From the pollinator photo matching game, distribute an equal number of flower and pollinator photos to the group of students. Have the students hold up their photo for everyone to see and have them make educated guesses at which animal pollinates which flower. Give clues. For example, the students may know that the Lesser Long-nosed Bats and others are nocturnal, so clue them to the fact that the Saguaro Cactus flowers open at night to help them make the match. Help them make the connection between other adaptations of flowers and pollinators. Other examples might be a tube shaped flower and a long proboscis or color patterns only visible in the UV spectrum and the ability to see UV light. Remember that pollination also occurs by wind and water. Show examples of grass flowers to illustrate the types of adaptations that a wind pollinated flower may have evolved (i.e. no need for petals).

**Conclusion:** Share some of the fun facts from pgs. 4-5 of the KIN Journal and let the students observe pollen grains and insects under the dissecting scope.