

BATS, BEES, BIRDS, AND BLOSSOMS

Students build a pollination model or complete a crossword puzzle to understand and describe the partnership between flowering plants and their animal pollinators.

ARIZONA SCIENCE STANDARDS

SC00-S1C3-01,
SC03-S4C3-03&04,
SC02-S4C1-02,
SC03-S4C1-01,
SC03-S4C4-01

OBJECTIVES

Students should:

- Explain the steps of pollination.
- Describe the benefits of pollination to plants and their animal pollinators.
- Understand that fruits and seeds are products of pollination.

BACKGROUND

After you have read the teacher background information, you will be ready to embark on the study of pollinators, flowers, and the importance of plant/animal partnerships.

GETTING READY

For younger students, make copies of *Student Handout - Pollination Partners Page* (attachment) and compile the materials listed on the left margin of the next page. For older students, make copies of *Student Handout - Bats, Bees, Birds, and Blossoms* (attachment)

DOING THE ACTIVITY

SETTING THE STAGE

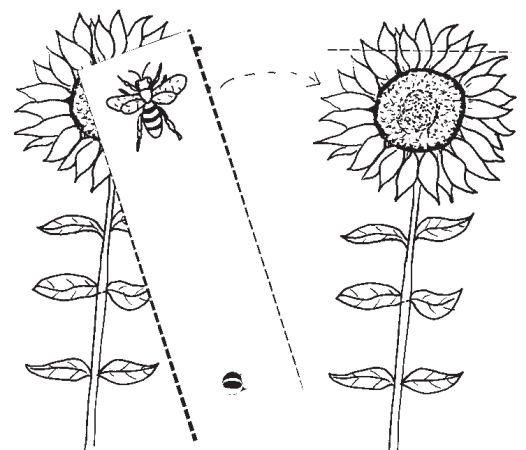
- 1) Introduce the subject of pollination by asking the students, "Why do plants make flowers?" If they mention anything about plant reproduction, they are on the right track. Tell them you are going to be studying the important relationship between plants and animals by focusing on flowers.
- 2) For younger students, follow the procedures for the *Pollination Partners Page* below. For older students, pass out a copy of the student handout *Bats, Birds, Bees, and Blossoms* to read and complete the crossword puzzle.
- 3) Write key vocabulary on the board to use in later discussion.

POLLINATION PARTNERS PAGE (FOR YOUNGER CHILDREN)

- 1) Pass out a copy of the student handout *Pollination Partners Page* to each student. Lead them through the construction of the model by making your own along with them. First, have them cut out the honeybee strip and sunflower

seeds square along the thick dotted lines and set these aside. Hold up the main sunflower picture.

- 2) Ask the students if they know what kind of flowers are in the picture. (sunflowers) Hold up a picture of a sunflower. Ask how many of them have eaten sunflower seeds. Explain that sunflower seeds come from flowers that look like these, and that the flowers are usually bright yellow. Have the students color their sunflower pictures, taking care to make the petals yellow and centers brown.
- 3) Next have the students color their bees on the bee strip. Pass out hole punches and the brass paper fasteners and have the children punch out a hole on the "X" on the bee strip and between the sunflowers at the bottom of the picture. Have them put the bee strip on top of the flower picture, line up the holes, and put the brass fastener through so the bee can swivel from one flower to the next.
- 4) Show the students how to make the bee visit the two sunflowers by moving the bee strip on the brass fastener. Ask the students "Why do honeybees visit flowers?" Explain that honeybees visit flowers because the flower makes two things that they need, **nectar** and **pollen**. Nectar is a sweet juice that honeybees use to make honey. Pollen is a powder that they gather from the flower to eat.



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MATERIALS (POLLINATION PARTNERS PAGE)

- A copy of *Student Handout - Pollination Partners Page* for each student.
- Scissors
- Brass paper fasteners
- Hole punches
- Glue sticks
- Yellow construction paper
- Sunflower seeds
- A picture of a sunflower from a book or magazine

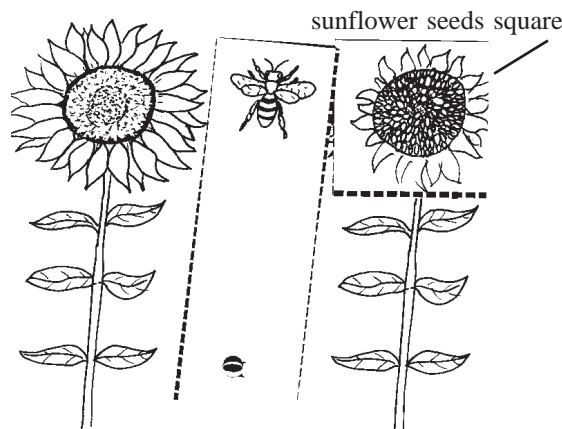
MATERIALS (POLLINATION CROSSWORD PUZZLE)

- A copy of *Student Handout - Bats, Bees, Birds, and Blossoms and Pollination Crossword Puzzle* for each student.

VOCABULARY

Nectar
Pollen grain
Pollen tube
Pollinated
Pollination
Pollinator

- 5) Pass out the glue sticks and yellow construction paper and instruct the children to punch about 10 yellow circles from the paper to represent pollen. Have them glue a few in the center of each flower. Then have them put some loose "pollen" on the flower on the left.
- 6) Tell the students that when bees visit flowers to drink nectar and gather pollen, some of the pollen sticks to them. Have the students slide their bee strips to the flower on the left and sprinkle some yellow paper "pollen" onto their bees.
- 7) Explain that when the bees go to the next flower, some of the pollen will stick to it. Have them move the bee strip with paper pollen over to the right-hand flower, deposit their pollen on it, and glue it down. Tell them, "Congratulations! Your bee just **pollinated** the sunflower!" Explain that **pollination** happens when pollen is carried from one flower to another. Wind can sometimes pollinate plants, but often animals like our bees are the **pollinators**. Ask the students, "What other animals can you think of that visit flowers and might be their pollinators? (hummingbirds, butterflies, moths, etc.)"
- 8) Tell the students that pollination is important because it helps the plant make fruits and seeds. Ask the students, "What are seeds for?" (They grow into new plants.) Have them color the "sunflower seeds" square



petals brown) and fold it at the thin solid line. Have them take the folded edge and glue it to the dotted line above the right-hand sunflower. Then have them fold it over the sunflower picture to show that seeds have formed.

- 9) Pass out some sunflower seeds to each child so they can taste the products of pollination.

POLLINATION CROSSWORD PUZZLE FOR OLDER CHILDREN

Pass out the student handouts *Bats, Bees, Birds, and Blossoms* and *Pollination Crossword Puzzle* (attachment.) Have them read the information then complete the crossword puzzle using clues from the reading. Discuss the reading as a group.

DISCUSSION

- 1) Confirm student understanding of the process of pollination by asking questions such as:
 - What are flowers for? (They are how plants make new plants; plant reproduction.)
 - What do the male parts of flowers make? (pollen)
 - What do the female parts of flowers hold inside them? (eggs or seeds)
 - What has to happen for seeds to form? (Pollen from one flower needs to reach the eggs of another flower.) What is this called? (pollination)
 - What do you call the animal helpers that carry pollen from one flower to another? (pollinators)
 - How do flowers reward pollinators? (with nectar, pollen, and oils)
- 2) Have the students consider the importance of pollinators to the plants they pollinate. Ask:
 - Why do plants need their particular pollinators? (Plants need pollinators

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to help them make fruits and seeds.)

- What do you think might happen to a plant if its pollinator disappeared? (The plant might not be able to attract a substitute pollinator to visit it, and it might not be able to produce enough seeds to grow more plants.)
- 3) Now consider the importance of plants to the pollinators they feed. Ask:
- What might happen to a pollinator if its plants disappeared?
 - (The pollinator might not be able to find another kind of plant from which to get nectar and pollen, and it might die off.)
- 4) Tell your students that your school will be able to help pollinators find food by planting a “pollination garden.”



EXTENSIONS

Before embarking on flower dissection, provide the students with a few flowers heavily laden with pollen and a small piece of black paper. Have the students lightly rub the flower across the top of the paper so they can see traces of pollen against the black background. Try the following experiment.

Soak sugar in warm water and place it in a saucer. Find a flower that has lots of pollen and shake the pollen onto the surface of the sugar solution. Cover with a piece of glass or plastic wrap and let it stand in a warm place for several hours. If the experiment is successful, you will be able to see little tubes growing from the pollen grains. Use a hand-held magnifier to get a better look.



ANSWERS TO POLLINATION CROSSWORD PUZZLE

Across:

2. pollination
4. nectar
7. seeds
8. pollinator
9. egg
10. petals

Down:

1. flowers
2. pollen
3. gardens
5. moth
6. homes