

EarthWorks Orchard Curriculum

Pollination

Grade(s): 2-5	Topic: Pollination, Flowers, Plant Life Cycle, Plant-Animal Interactions	Season: Early Fall or Late Spring, when there are flowers
Timing: 60 minutes including 5 minute RPK, 5 minute introduction, 10 minute pollination demo, 15 minute outdoor pollination observation, 20 minute pollinator match game, and 5 minute conclusion		
Objectives: <ul style="list-style-type: none">• Students can explain that flowers are the reproductive parts of plants and need to be fertilized with the pollen from another flower; a process called pollination.• Students can demonstrate how pollination works and how insects carry pollen from flower to flower unintentionally.• Students can match flowers to their pollinators and explain some of the methods flowers use to attract pollinators.		
Materials: <ul style="list-style-type: none">• Pictures of pollination and pollinators• Diagram of the parts of a flower (see Flower lesson for more information)• Chalk or flour• Magnifying glasses• <i>Pollination Observation</i> worksheets• Small cups full of juice or water to represent nectar• Pitcher of juice or water• Q-Tips (optional)• Pollinator Match Game cards and clues		
Prep Needed: <ul style="list-style-type: none">• Look around the orchard to see if there are pollinators or whether you will need to use the backup Q-Tip pollination activity with your class• If doing Pollinator Match Game, read clues, print out corresponding images, and paste them onto cards		
Degree of need for extra teacher or parent helper? Medium		
Journal Prompt: What is the job of a pollinator (bees, butterflies, bats, etc) in the orchard or a garden?		
Lesson Sequence: Reactivate Prior Knowledge: (5 minutes) Show some pictures of pollinators and discuss the journal prompt questions. If you have already done the Flowers lesson, discuss the role of a flower or blossom on a plant. If you haven't yet discussed flowers, ask students what they think the job of a flower is. Introduction to Pollination (5 minutes) Draw the plant life cycle on the board or have students fill it in from memory and emphasize the part between the flower and the fruit where pollination occurs. Stress that without pollination (and pollinators!) it would be impossible to have almost every fruit or seeds that we rely on. Revisit the flower diagram, showing the parts of the flower involved in pollination. Have students make a list of pollinators they know and show them pictures of pollinators and pollination if you have them.		

Pollinating Flowers Simulation Activity (10 minutes)

Note: This activity can be a bit messy due to the flour.

Explain that students will be acting out pollination in small groups. Model doing this activity once in front of the whole class, using about 6 volunteers. Have small groups of 6 act out the process as well, rotating parts to make sure that everyone is comfortable with the concept as a whole.

Ask for two children to act out being the stamen (male part) of a flower. The "stamen" will get their fingers and arms very powdery using flour or chalk that represents pollen, and will hold up both hands in front of themselves, fingers outstretched. Now ask for two children, preferably those wearing darker clothing, to act out being the pistils, the female part of another flower. The "pistils" also hold up their fingers outstretched. Two more children, preferably those wearing dark clothing, will act out being bees. The Dixie cups of water representing nectar will go right next to the stamen and pistils

In the pollination simulation, the bees will "fly" up to the stamen actors, get the pollen on themselves from the fingers of the stamen, drink the water, and move the pollen to the pistil-actors while doing the same nectar gathering.

After students have had a chance to play different roles, discuss why the bees and butterflies are important in pollination. Are they trying to move the pollen? No! They are trying to get nectar.

Pollination Observation (15 minutes)

Have the children search the garden for pollinators. Once the students have observed pollination have them fill out their observation worksheet. Students can use magnifying lenses to see details of the flower and insects.

Q-Tip Pollination (15 minutes)

Note: This is a good alternative if there is little insect activity in the orchard.

Have the students draw flowers and label pollen even if there are no pollinators. Tell students since there are no insects out today, *they* will be the pollinators! Show them how to transfer pollen from one flower to another flower of the same kind using a Q-tip. Emphasize that they should touch the flowers gently. If they cannot find any pollinators outside, they can draw flowers, being sure to label the pollen and flower parts involved in pollination.

Pollination Explanation and Pollinator Match Game (20 minutes)

Have students share what they observed outside and try to get them to explain the process of pollination.

Key Points:

- Pollen from one flower has to get to the same species to pollinate it
- Insects are going for nectar primarily, rather than *intending* to move pollen
- Pollination leads to an egg being fertilized which becomes a seed which makes more seeds which makes more flowers
- Plant/pollinator relationships are mutually beneficial; both need the other to survive
- Insects will spread pollen to many places where it cannot be used (just like in the

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seed dispersal lessons, there is much more pollen produced than necessary for this exact reason).

Game

Split kids into two groups. One will be pollinators and the other will be plants that get pollinated. Give each student a picture of their plant or pollinator and the set of clues that go with it. Have students work out their matches by talking about their flowers or pollinator preferences. After everyone has found a match, come together and see how everyone did.

Conclusion (5 minutes)

Review what the class has learned about the pollination part of the plant life cycle.

Vocabulary

Fertilization
Flower
Nectar
Ovary
Petal
Pistil
Pollen
Pollination
Pollinator
Reproduce
Seed
Stamen

Vocabulario

Estambre
Fertilización
Flor
Néctar
Ovario
Pétalo
Pistilo
Polen
Polinización
Polinizador
Reproducir
Semilla

Extensions / Homework Ideas

- Have students write about a flower from the perspective of a pollinator. What is it like to walk on the different parts of the flower? How does the pollen feel when it sticks to your legs? How does the nectar taste? What attracts you to the particular flower you go to? (Color? Scent? Shape?) Do you have any adventures on your way to the next flower? Have students use vocabulary words.
- Play the pollinator flower matching game but this time with plants and insects the students have invented. Make sure to remind them about how the shapes and smells should match their pollinator and be specific to each pollinator, so that the plant can

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guarantee its reproductive success. Have them write their own clues to go with their plant/pollinator drawings.