



PLANT PARTNERS

Classroom
60 minutes

Learning Target(s):

Students will be able to design a model of pollination and how it works.

Measurable Objective(s):

By end of lesson, 80% of students will describe how their pollinator model does pollination.

Interpretive Thought(s):

Plants have flower friends (pollinators) which help them reproduce.

Materials:

Flower Friends Story,
Pollinator Demonstration
Supplies, "Pollinator Test
Zone" Supplies (pipe cleaners,
model flowers with pollen),
Recording Device

Supports NGSS:

2-LS2-2

INTRODUCTION

1. Introduce the upcoming trip to Ballona Wetlands Saltwater Marsh.
2. We are going to explore how plants have partners, or friends, which help them survive and make baby plants, seedlings.
 - a. What does a plant need to survive? Water, Soil, Sunlight, Air
 - b. Those items help a plant to stay alive but for it to be able to make new plants, it often needs some help. Let's read about a plant and the flower friends that help it out.

BODY

Read the Flower Friends story¹ and discuss the following during and after the story.

1. Flower Head Demonstration - do this after reading page 4
 - a. Have students stand up at their desks or if in a large group, spread out so their hands don't touch.
 - b. Then have students "root" their feet to the ground like a plant and pretend their head is a flower with pollen it needs to spread to other flowers.
 - i. Can they touch another "flower head" with theirs? Make sure students don't hit their heads together if any are close enough to actually touch.
 - c. Most students should be unable to spread their pollen to another "flower head".
 - i. Explain that because plants are rooted in an area and don't move, they have to use some flower friends to help them spread their pollen.
 - d. Have students return to their seats and finish the story.
2. Pollinator demonstration² - to be done at the conclusion of the storybook
 - a. I need a few brave volunteers to pretend they are a bee or butterfly or fly.
 - b. As a Pollinator, you are looking for nectar, a sweet energy-rich "juice" that helps you survive. In our demonstration, nectar will be represented by Starburst candy. Nectar is often stored deep within a flower so you'll have to search around our demonstration flower until you find one "nectar".
 - c. Have students find "nectar" in one flower and pause the demonstration.
 - i. Have the Pollinators hold up their nectar-seeking hand for the class to see. They should have some flour (or other allergy-free powder) on their fingers.
 - ii. Ask Pollinators: What did you get on your hand as you searched for nectar? It looks like you got some "pollen" on you! Did you mean to get pollen on you? No, you were just looking for nectar. This is exactly what happens in real life. As pollinators look for their food, they get pollen on their body. How about you continue to be a pollinator and look for nectar in a new flower...
 - d. Allow Pollinators to find nectar from a new flower and then pause the demonstration.
 - i. Ask Pollinators: Do you think some of the pollen from flower 1 was moved to flower 2? Yes! That is what pollination is! Animals, like bees, butterflies, and hummingbirds find their food and in the process, move pollen from one flower to another. When the pollen is moved, it means the flower can make seeds that will grow the next generation of plants.
 - e. Have Pollinators return to their seat but ask them to share their extra "nectar" with a friend.
 - f. If time allows, show students the [What is Pollination?](#) animation.
3. Pollinators may be eating nectar or collecting pollen, a protein-rich food, but as they move flower to flower and plant to plant, they move the pollen around and help plants pollinate which allows for fruit and seeds to grow.
4. In our example, pollen got stuck to the hand of our pollinator and it isn't even hairy. The hairy body of insects and feathers of a bird are an even better way for pollen to travel. You are going to create a model to show how pollination works and luckily, you will get to use things that are plenty hairy.

- a. "Pollinator Test Zone"² - Using the supplies provided (pipe cleaners "chenille stems", feathers, etc.) create a pollinator. Then you will have the chance to test if your pollinator does move pollen from flower to flower. As you finish, raise your hand and you will be called up to test your pollinator. For those who finish making their pollinator, you can also create a flower for your pollinator to visit.
- b. *Hand out supplies and set up the "Pollinator Test Zone" with the two model flowers with pollen in them.*
- c. *As students finish, have them come forward and if time permits, allow them to describe their pollinator. Then ask them the following two questions and record (visually or audio if allowed) or using a Google Form to track responses:*
 - i. *Show me how your pollinator helps these flowers pollinate? This can include physical modeling along with a description that should include the pollinator going to one flower (to eat) and getting pollen on its hairy body. Then it travels to another flower (to eat) and some of the pollen from the first flower is dropped on the second flower and it also gets more pollen on its body. If a student does not model moving to another flower, you can ask follow-up questions to help guide understanding of pollination being the moving of pollen from one flower to another.*
 - ii. *Why does your pollinator visit each flower? This will be a description and should include a reference to the pollinator looking for food (nectar, pollen). If a student does not respond with a correct answer, you can help reframe the question to help the student understand and provide the correct answer*

CONCLUSION

1. Plants rely on animals to spread their pollen flower to flower and successfully reproduce and your created pollinators are an excellent model showing that!
2. While visiting Ballona Wetlands we will try to find some flowers, pollinators, and seeds and discover, through observations and games, how they all work together in a plant partnership that helps both plants and animals survive.

VOCABULARY

Flower: the part of the plant that has petals and can produce pollen and fruit

Nectar: a sugary liquid secreted by plants to attract pollinators

Pollen: the small powder-like substance that causes plants to form seeds

Pollinate: to carry pollen from one part of a flower to another, or to a different flower

Reproduction: how plants and animals make new plants and animals like themselves

Seed: the object that many plants make to reproduce

Seedling: a young plant that sprouts from a seed

References

¹ Story inspired by California's Education and the Environment Initiative. (2013). California Environmental Protection Agency (2nd Ed.), Unit 2 *Flowering Plants in Our Changing Environment Reader: Mother Orange Tree*.

ACTIVITY RUBRIC

Use a recording device (video or audio), or a Google Form to track responses.

Supporting NGSS 2-LS2-2:

Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

| | Improvement 1 | Approaching 2 | Meets 3 | Exceeds 4 |
|--------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Objective 1 | Did not model how a pollinator pollinates | Partially models how a pollinator pollinates | Models how a pollinator pollinates | Mastered model of how a pollinator pollinates |
| <i>Example(s)</i> | <i>Does not identify pollinator playing any role in pollination (no mention of pollen attaching or moving)</i> | <i>Through action and description, partially shows how pollen attaches but does not show movement of pollen. May only have pollinator visit one flower.</i> | <i>Through action and description, shows pollinator landing on one flower and traveling to second flower with pollen moving.</i> | <i>Through action and description, shows pollinator moving pollen and identifies this movement as helpful to flowers reproduction.</i> |
| Objective 2 | Did not identify reason for pollinator visit to flowers | Partially identified reason for pollinator visit to flowers | Identified reason for pollinator visit to flowers | Mastered identification of reason for pollinator visit to flowers |
| <i>Example(s)</i> | <i>Does not identify a reason for pollinator visit or thinks pollinator visits to "help the plant"</i> | <i>Through action or description, identifies pollinator is seeking food but does not use terminology (nectar or pollen)</i> | <i>Through action or description, identifies pollinator is seeking nectar or pollen as food</i> | <i>Through action or description, identifies pollinator is seeking nectar/pollen and describes why it needs food (to fly, to feed to young, etc.)</i> |