Ready · Set EXPLORE
in the classroom

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Second Grade Lesson Plan – The Buzz on Bea's Bees

Suggested time: 45 minutes

Lesson Snapshot:

In this lesson, students will demonstrate proficiency in developing simple models that mimic the function of bees pollinating plants. These simple models will be used to highlight the disciplinary core idea that plants depend on animals (bees) for pollination.

Background Information:

Bees spend most of their life drinking nectar and collecting pollen from flowers. Pollen is used as the main source of food to feed their young. While bees are collecting food for their young, they are also serving an important role in our natural ecosystem. In fact, bees are the main pollinators in Pennsylvania. Pollination occurs naturally as bees visit plants and flowers to collect pollen and drink nectar. The pollen attaches to the hairs on the bee's body and legs and as bees travel from plant to plant, the pollen is transferred. The movement of pollen from the male part of the plant to the female part of the same plant species is the process of pollination. Plants that flower require pollination and are a valuable source of food for animals and humans. Squash, cucumbers, tomatoes and eggplants are just a few examples of foods that require pollination by insects.

Fun Fact: The honeybee is the only insect that produces food for humans—honey! Bees can also fly for up to six miles, and as fast as fifteen miles per hour.

Science, Technology & Engineering, and Environment Literacy & Sustainability (STEELS) Standard(s):

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

Connections to Other Standard(s):

CC.1.4.2.W: Recall information from experiences or gather information from provided sources to answer a question.

CC.1.5.2.A: Participate in collaborative conversations with peers and adults in small and larger groups.

CC.1.5.2.E: Add drawings or other visual displays to presentations when appropriate to clarify ideas, thoughts, and feelings.

Objective(s):

Students will develop models that mimic bees pollinating plants.

Students will apply their knowledge of coding to demonstrate pollination.

Materials:

- *Bea's Bees* by Katherine Pryor
- Pollination worksheet (at the end of this file)
- Pollination Coding cards (at the end of this file)
- Bee Bots
- Bee Bot maps
- Pipe cleaners (black, yellow, and white)
- Craft sticks
- Pom poms
- Cornmeal or crushed up cheese curls- represents pollen

- Coffee grounds- represents pollen
- Cups or cupcake liners- represents flowers
- Glue
- Tray (1 per group)

Advanced Preparation:

Place cornmeal and coffee grounds in separate cups and place on trays. If using cheese curls, crush into fine particles.

Charge Bee Bots.

Suggested Implementation:

Part 1: Shared Read Aloud

Read *Bea's Bees* by Katherine Pryor.

Class Discussion Questions:

"Why are bees important for plants?" (help them grow by carrying pollen)

"How do bees collect pollen?" (the pollen dust attaches to the hairs on their legs, bodies)

"How do bees distribute pollen?" (moving from flower to flower)

Discuss student responses, guiding students to understand how pollination works and why bees are important.

Part 2: Investigation(s)

Students will create a bee using pipe cleaners, a craft stick and pom poms.

Students will use their bee to mimic the pollination process.

Encourage students to take their bee to each "flower," dipping their bee in the cornmeal cup and in the coffee grounds cup. Encourage students to move their bees between the "flower cups" a few times to demonstrate the pollination process.

Examine the "flower" and bee and describe what happened.

"Did this investigation demonstrate that the bees successfully pollinated the flowers?" (Yes, the pollen was distributed in both "flowers" and all over bee)

Students will complete the pollination worksheet to demonstrate their understanding of the pollination process.

Part 3: Exploration

Distribute Bee Bots and Bee Bot maps.

Provide time for free exploration with the Bee Bot.

Discuss features of the Bee Bot.

Part 4: Code

Distribute the Bee Bot map with the first pollination card in place.

Students will read the first pollination card, then code the Bee Bot to its next location.

Challenge students to use the pollination coding cards and code the Bee Bot to each location on the map, returning to the beehive.

Part 5: Summation

Review/discuss pollination and why it is important.

Review/discuss why bees are important.

Review/discuss the Bee Bot activity and coding.

Extension Activities:

- Explore honeycombs, making connections to math shapes such as hexagons.
- Develop curiosity around the question, "What if bees were not around?" Provide opportunities for students to research and propose potential solutions.
- Research other animals that are pollinators such as butterflies, bats, and birds. Compare and contrast how their physical characteristics and ways they pollinate are similar and different than bees.

PBS Resources and Links:

Pollinators | Wild Kratts | PBS LearningMedia (video short: 1:33 minutes)

Pollinators | Cyberchase | PBS LearningMedia (video short: 1:01 minutes)

Bees: What's the Buzz about Bees? | Science Trek | PBS LearningMedia (video short: 5:26 minutes)

Pollinator Pathway | Games | Nature Cat | PBS KIDS (interactive game)

Connections to Other Standard(s):

3.4.K-2.D: Plan and carry out an investigation to address an issue in the local environment and community.

CC.1.4.2.A: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

CC.1.4.1-2.U: With guidance and support, use a variety of digital tools to produce and publish writing including in collaboration with peers.

CC.1.4.1-2.V: Participate in individual or shared research and writing projects.

CC.2.3.2.A.1: Analyze and draw two- and three-dimensional shapes having specified attributes.
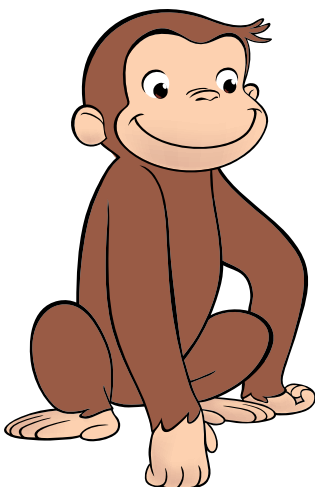
Resources/Acknowledgments:

STEELS Standards

Making Pollinating Bees

Bee Bots

US Forest Service- Bee Pollination
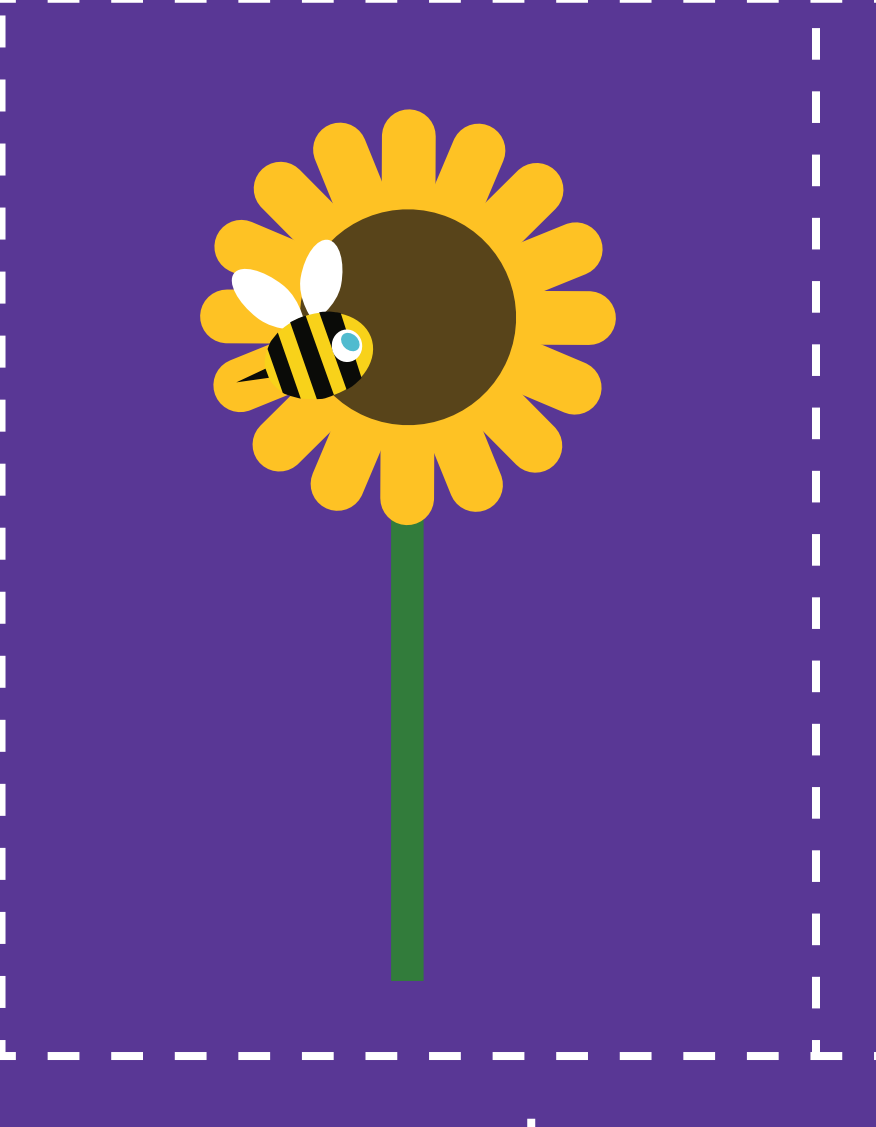
Penn State Extension

Pollination Demonstration!

Sketch you design!

What do the cornmeal and coffee grounds represent?

_____

_____

_____

What is cross-pollination?

_____

_____
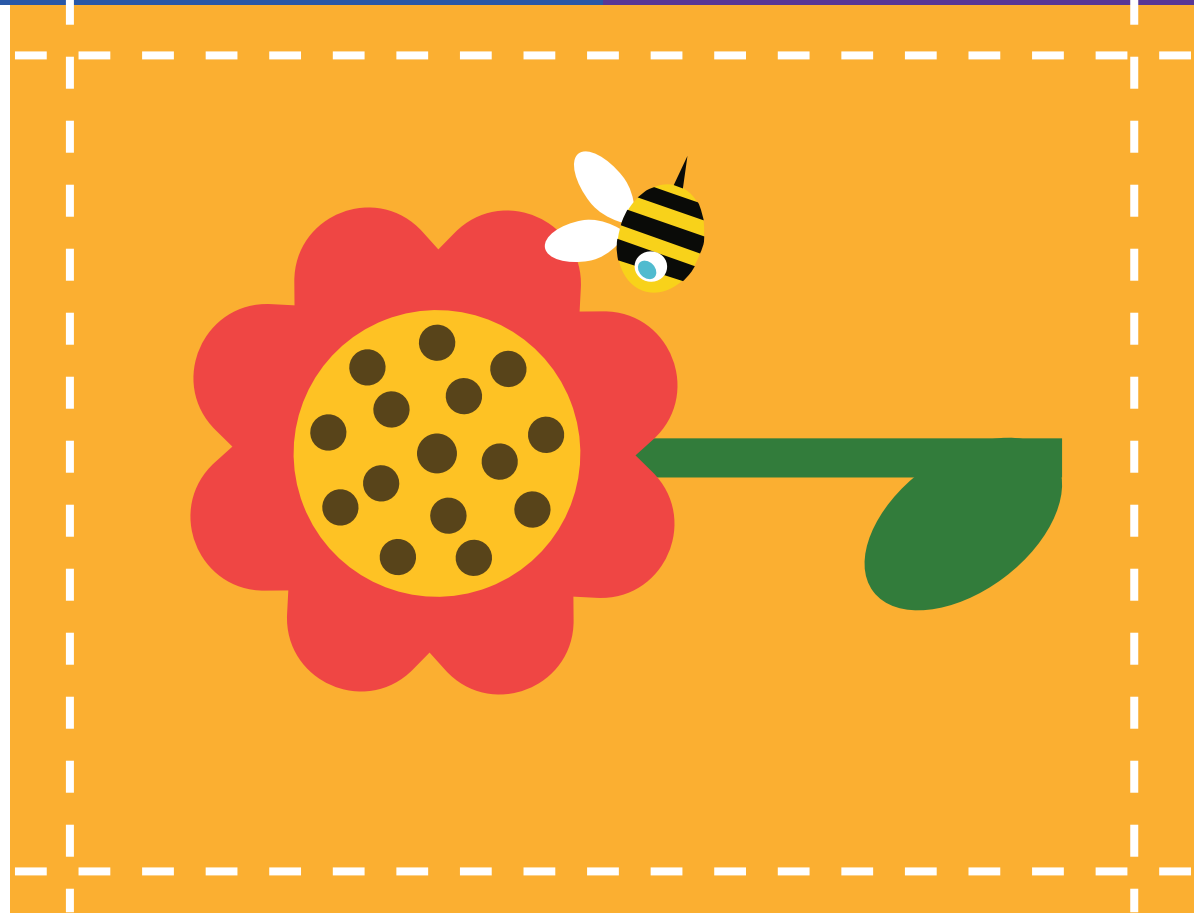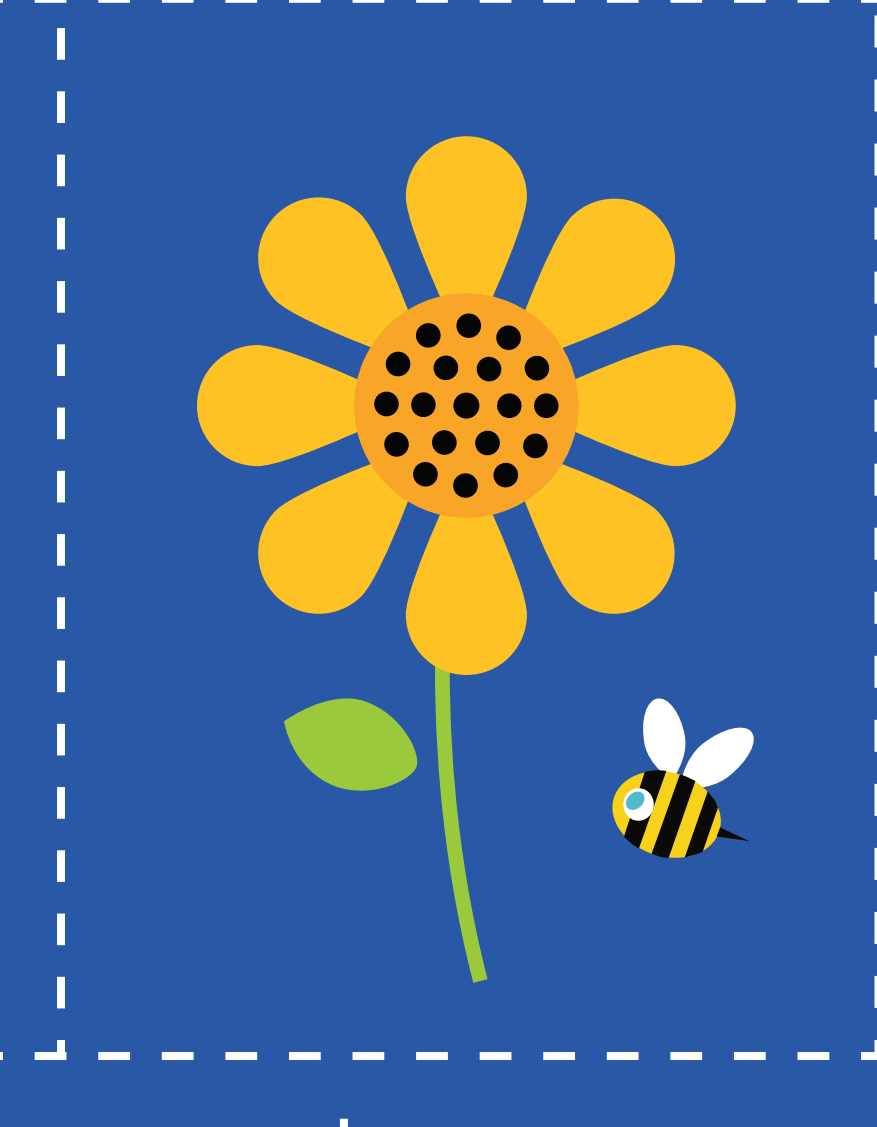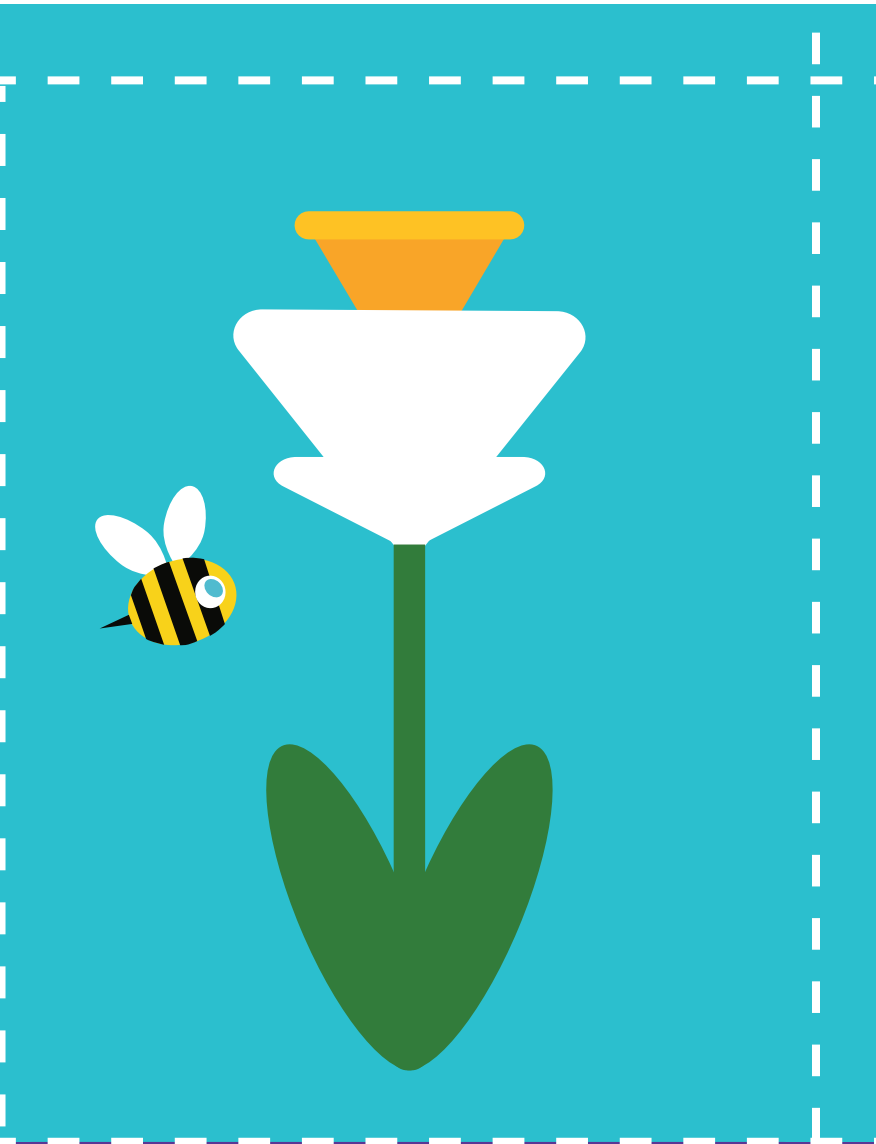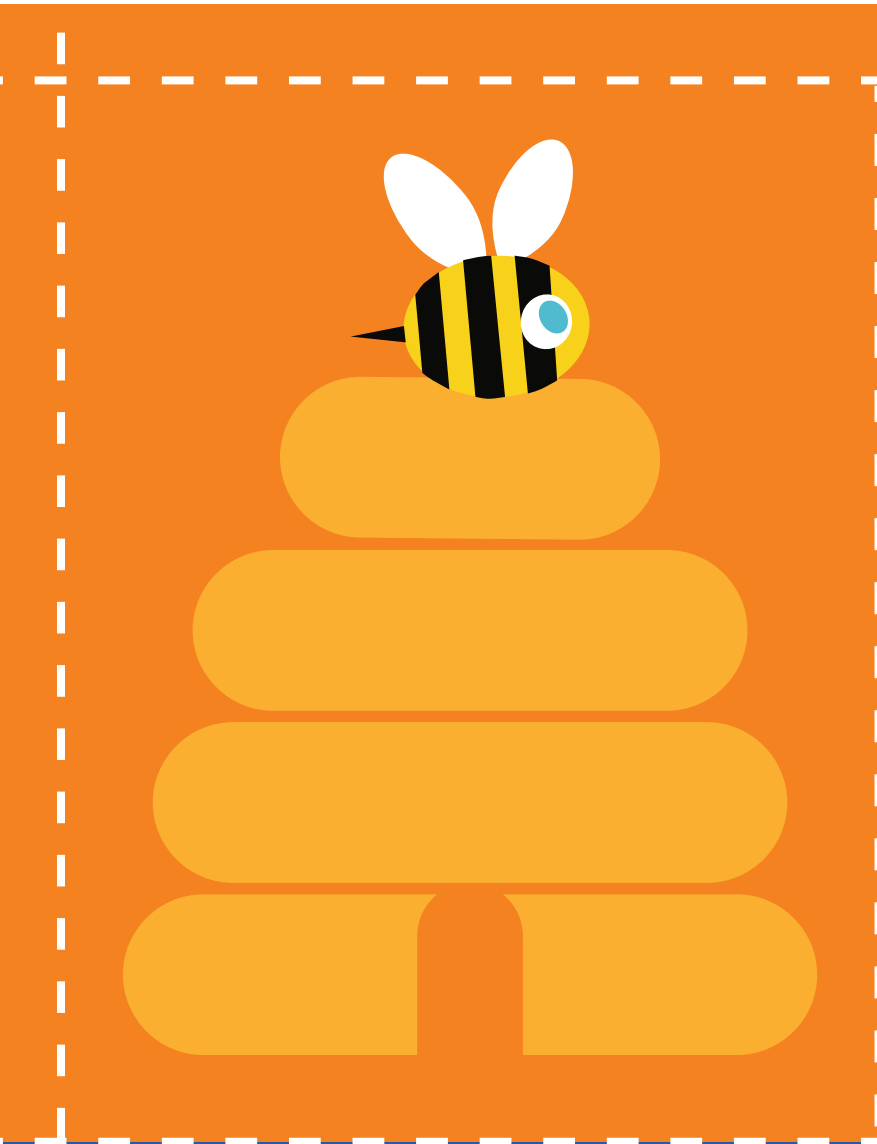
Move your Bee 2 spaces forward.

Then, turn Bee to the right and forward 1 space.

Turn Bee to the left, move forward 1 space.

Next, turn Bee to the left and 1 space forward.

Then, turn Bee to the right and 1 space forward.

Last, turn Bee to the right, 2 spaces forward.

Turn Bee to the left and 2 spaces backwards.

Turn Bee to the right and forward 2 spaces.

Turn Bee to the right and forward 1 space.

Turn Bee to the right again and forward 1 space.

Turn Bee to the left, and forward 1 space.

Turn Bee to the right, and move 3 spaces forward.

Did you make it back to the beehive?