

Bio/Diversity Project
Lesson Title: Pollinators

Teacher: Eleanor Allen-Henderson + Michael Roberta
Grade Level: Kindergarten

Adapted from: JoAnn Clapp

Common Core Standard:	<p><i>Life Science Standards K.L1U1.6</i></p> <p><i>Obtain, evaluate, and communicate information about how organisms use different body parts for survival.</i></p> <ul style="list-style-type: none"> ● <i>Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air.</i>
Content Objective: Math, Reading, Science, Writing, Other:	<ul style="list-style-type: none"> ● <i>Students will be able to explain how pollination helps plants reproduce.</i> ● <i>Students will be able to understand how bees participate in pollination.</i>
Language Objective: (Optional)	N/A

Vocabulary	Materials
<p>Provide a bulleted, alphabetized list of words that students will hear, speak, write, and/or read about in the lesson. These words are integral to developing content understanding:</p> <ul style="list-style-type: none"> ● Pollinators (bees) ● Diversity ● Pollen 	<p>Provide a bulleted list of relevant materials for the lesson.</p> <ul style="list-style-type: none"> ● Socks ● Velcro ● Ping-pong balls ● Colored pencils ● Hula hoop ● Crayons ● Printed coloring sheets ● Booklets for Evaluation Activity ● Handout with a diagram of a bee
<p>Seasonality: (If more specificity is required, please note date/time range under the season)</p>	

N/A

Highlight which season(s) your lesson would be most suited to. When working with the natural world, it is important to keep this in mind for your planning! Some activities are possible for a brief window of time while others may be appropriate during any time of year.

<i>Monsoons</i> July-Sept.	<i>Autumn</i> Oct.-Nov.	<i>Winter</i> Dec.- Feb.	<i>Spring</i> Mar.-Apr.	<i>Dry Summer</i> May-June
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Guiding Questions:

Write down bulleted, guiding questions that you will ask students in order to promote a deeper understanding of the subject matter. These are questions you will ask many students, and maybe even more than once per student.

- Has anyone heard the word pollinator before?
- What is pollen? (reference to lesson one)
- Can you name any types of pollinators? Any guesses?
- What are your favorite pollinated foods? (fruits + vegetables)
- Do you think bees are the only pollinators? If not, what other pollinators exist?

Engagement/Introductory Activity:

- Teachers will begin by asking the students how they think plants are made; one student teacher will draw ideas as the other leads the discussion.
- The engagement will gauge how well students are able to integrate their knowledge of flower parts.
- Show video of the reproduction and life cycles of plants. <<https://www.youtube.com/watch?v=w77zPAtVTuI>>
- This brainstorming will introduce pollination; during the first class session, wherein animal pollinators are introduced, teachers will focus the lesson specifically on bee pollinators.
- In order to break up the material, teachers will have the students imitate the sounds of bees as an engagement activity. This will transition into our exploratory activity.

Exploratory

- During the classroom activity, teachers will have the students experience pollination through a hands on activity.
- The overview of the activity will be explained first. As a classroom management tool for a lesson based in physical activity, teachers will use “freeze tag.” students must be still before we transition between activities.

- During the activity, each of the students will have a legging to on their lower leg (the leggings are simply men's socks with the foot part removed). On the legging there are Velcro strips (teachers will hold a sample up for the students to see). These Velcro strips act like the hairs on a bee's legs.
- Teachers will also have ping pong balls with Velcro dots stuck on them (again teachers hold up a sample for the students to see). These ping pong balls represent the balls of sticky pollen on the flowers that the bees visit. The ping pong balls will be sitting in the middle of the hula hoops on the ground, the hula hoops will represent flowers.
- The students will attempt to collect ping pong balls with their 'leggings' making sure to not use their hands. They will have five minutes for one round. The students can use the five minutes how they like, but if their leggings become 'full' of pollen, students can drop the pollen off with one of the student teachers, who will represent the other flowers, signifying the process of pollination.
- After the first round, teachers will adjust hula hoops, removing one. The changes in the layout of the game represent how changes in the environment affect a bee's ability to pollinate. The rules will take five minutes to explain, and each round of the pollination game will take 7 minutes (5 minutes timed, two minutes to transition between rounds).
 - The adaptations of the game will segway into a conversation about the conditions that make the game easier/harder. Connecting the quantity of flowers to the ease at which pollination occurred. This will help students answer questions like, "looking at your playground would it be easier or harder to pollinate with fewer flowers?"

Explain:

- Teachers will use the explain section of the class to ask students how the changes in environment affected the ability to collect pollen
 - "if every student picks a flower in our playground, will that help or hurt bees?"
 - Reference to the adaptations in our explore activity
- A central question will be to inquire to the students what the most challenging aspects of their activity were.
- In order to evaluate understanding teachers will ask questions like: do you think all plants are pollinated? what other animals have you seen land on flowers? do bees help our food grow?

Extension Activity/Questions:

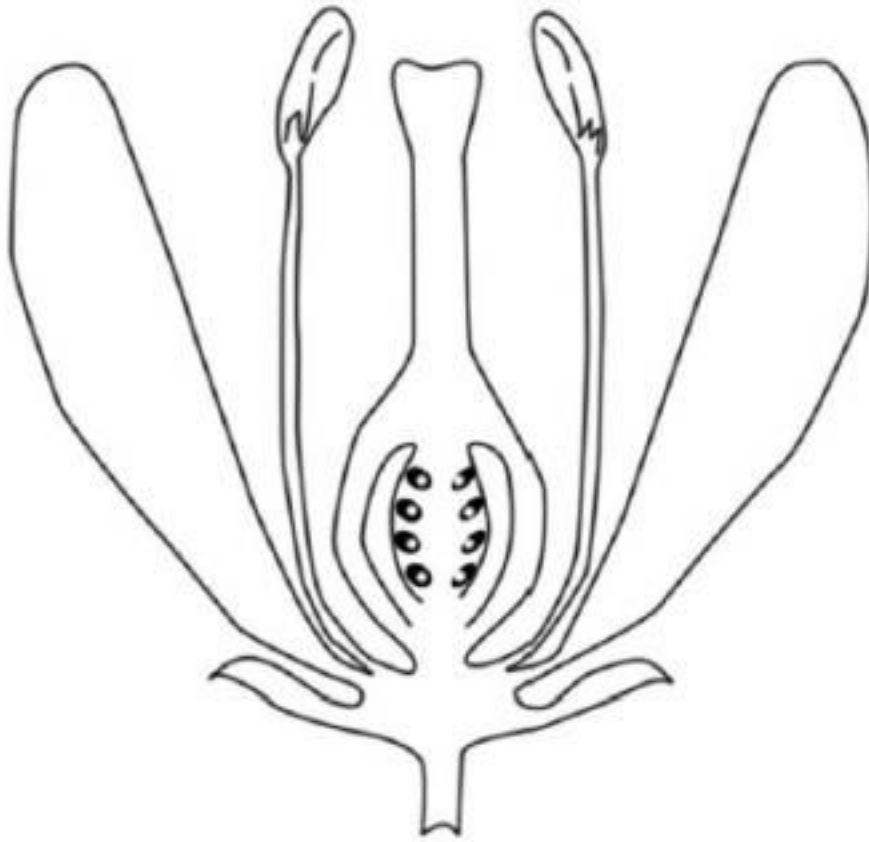
- For our extension activity, will will divide the class into two groups. Each teacher will help students as they come up with their narrative for their bees, providing guiding questions like, what would a bees day look like? To conclude teachers will facilitate the exchange of classroom stories.

Evaluation Activity:

- Ask the students one thing new that they have learned today or have found interesting.

- Students will draw an image of a bee in their Bio/Diversity notebooks.

Parts of a Flower





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