

Insect Adaptations

Investigative Question- What are some adaptations that insects have that help them to feed on different foods and from different parts of plants, especially flowers?

Goal: Students explore the ways that insects collect pollen and compare mouthparts to determine if an insect collects pollen or nectar.

Objectives:

Knowledge- Students examine how pollinators collect pollen and nectar, including where pollen and nectar are located on an insect's body.

Skills- Students use microscopes and develop observation skills to make careful observations of insects.

Values- A diversity of insects are important for a healthy, functioning food web.

Special Safety: Remind students to ask before handling any of the insects.

Grade(s): 4

VA Standards addressed: Science (2018) 4.1, 4.2, 4.8

Materials:

Students in groups of 2 at a microscope

- * Per group- 2 data sheets, pencil, insect in petri dish, dissecting microscope
- * Laminated mouthpart cards, one set per table
- * Photos of insects visiting flowers

Insect samples should AT LEAST include:

- Bee with pollen pockets
- Bee with mouthparts extended.
- Butterflies with mouthparts
- Flies (especially bee mimics that have pollen)
- Moth or butterfly with pollen

Set-up:

- Charge dissecting scopes the day before.
- Place insects on petri dishes on microscope stages and place on counters along the room until ready to place in front of student groups.

Procedure/Instructional Strategy:

1. Inquiry:

- a. Ask students to recall the plant research they conducted at school.
- b. Ask:
 - i. What did you consider when choosing plants for a pollination garden (flower color, shape, sizes of plants, bloom time)?
 - ii. Why do insects visit flowers and plants? What are they doing at the plants?
Responses can be to gather pollen, to gather nectar, to prey on other organisms.

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2. Student observations:

- a. Explain to students they will make observations of insects to learn about the different types of insects that might visit flowers and observe if and where pollen is located on an insect. They will look at other adaptations such as the size and structure of mouthparts, legs, and other body parts. Then they will predict what type of flower (Use flower shape images for reference they think the organism will visit.
- b. Review how to use a microscope, and instruct students to keep the insects on a petri dish so that they do not get destroyed! Teams of two will use a microscope and the data sheet to make observations.
- c. Ask adults to assist by placing a microscope in front of each team. For about 5-10 minutes, student teams observe an insect and record observations on their data sheet. Instructors can assist by trading the insects on petri dishes for students to observe and record data on a second insect. If time allows, insects can be switched again.

3. Conclusion: Ask students to share what they learned about the insects that examined.

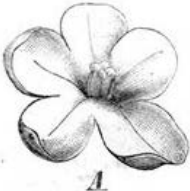
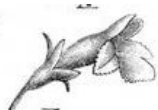
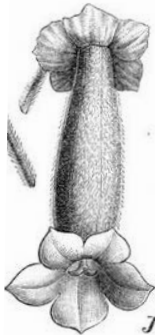
- a. What were some adaptations you observed on the insects?
- b. Was examining these insects helpful to learn about the diversity of insects?
- c. Will this information help you to choose plants for your garden?

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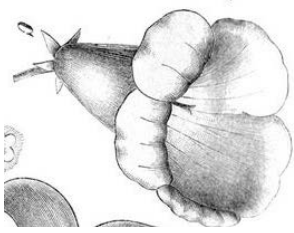
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Data sheet: Student Name(s) _____

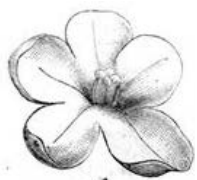
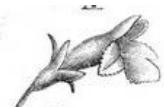
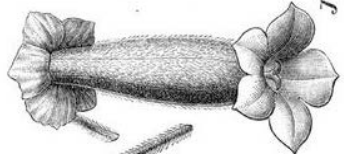
Insect name/Type of insect	Draw the insect.	
Do you see pollen on the insect? Where is it located?		
1. Circle the type of mouthpart the insect has. <ul style="list-style-type: none"> - Chewing - Sucking - Lapping - Sponging 	2. Draw the mouthpart	
What type of flower do you predict this insect will pollinate? Circle your prediction.		
<ul style="list-style-type: none"> • Flat and wide open flower <div style="text-align: center;">  <p style="text-align: center; margin-top: 5px;">A</p> </div>	<ul style="list-style-type: none"> • Short and tube shaped <div style="text-align: center;">  </div>	<ul style="list-style-type: none"> • Long and tube shaped <div style="text-align: center;">  <p style="text-align: center; margin-top: 5px;">J</p> </div>



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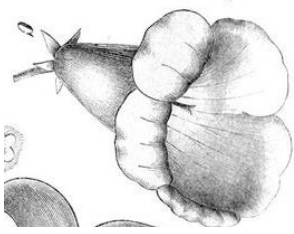
<ul style="list-style-type: none"> A large 'sleeping bag' flower it can climb into 	<ul style="list-style-type: none"> Draw other ideas 	
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