



Activity: An Insect Picnic

Grade Level: 3rd-5th grade

Time required: 20 minutes for preparation;
30 minutes for activity



Subjects covered: Life Sciences, Adaptations, Insects

Skills: Observation, Experimentation, Critical Thinking, Note-taking

Common Core and NGSS Standards:

- LS3.A: Inheritance of traits. Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and the environment. (3-LS3-2)
- LS3.B: Variation of traits. The environment also affects the traits that an organism develops. (3-LS3-2)
- LS4.C: Adaptation. For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3)

Objective: Students will understand how mouthparts are adapted to allow insects to access and consume food from a particular food source.

Materials:

- "Insect Picnic" Activity Sheet
- Plastic Straws
- Sponges
- Cups or containers (some with long, narrow openings, such as graduated cylinders, and others with normal/standard openings, such as beakers)
- Paper plates
- Trays
- Water or Juice
- Clothespins
- Scissors
- Paper towels
- Small food items such as marbles, cereal, popcorn, raisins, etc.
- Other art supplies (be as creative as you would like)



Background:

Over time, insects have developed different types of mouthparts to allow them to exploit different food sources. Butterflies, for example, use siphoning mouthparts to drink nectar from deep inside flowers. Piercing and sucking mouthparts are used by the assassin bug, among others, to pierce the exoskeleton of other insects and drink their insides. Houseflies use sponge-like mouthparts to soak up liquids from rotting plants and animals. Grasshoppers have chewing mouthparts to eat leaves and other items that must be broken into small bits before being swallowed. Insects with mouthparts adapted to specific food sources are often unable to take advantage of other food sources. This allows for the development of niches, which are specific roles and places in an ecosystem that animals and plants take on. However, when a food source is compromised it can result in the organisms dependent on that food source to perish if they cannot take advantage of another source.

Preparation:

Print one activity sheet for each student. Construct the following mouthpart tools and food options for each group, or provide extra time for students to construct them, depending on age level and ability.

Mouthpart	Construction of Mouthpart	Food Source	Construction of Food Source	Example
Siphoning	Long straws, no modification needed	Nectar in a flower	Pour water in a long tubular container (i.e., a graduated cylinder)	Butterfly
Piercing/Sucking	Straws, cut so that one end has a point	Liquid inside a plant stem or under an insect exoskeleton	Pour water in a cup and cover with plastic wrap	Assassin Bug
Sponge-like	Attach small pieces of sponge one	Rotting fruit or meat	Place a wet sponge on a tray	Housefly

	end of each straw			
Chewing	Clothespins	Leaves or small insects	Lay out plate of small items	Grasshopper

Activity:

Divide students into groups of 3 or 4. Give each group a set of the four different mouthpart tools and food sources, as well as two collecting cups for their liquid and solid food. Have students try to transfer food from the different food sources to their collecting cups. Students using the “sucking” mouthpart should place their straws in the water source and cover the end with their finger, trapping water inside the straw. Then, they should move the straw to the collecting cup, and remove their finger, releasing the water. Students using the “piercing/sucking” mouthpart should pierce the plastic-wrap covered cup with their straws, and then transfer water in the same way as the “sucking” mouthparts. Students using the sponge-like mouthparts should place the sponge-end of their straws on the larger wet sponge and press down. After a few seconds, they should place their sponge over the collecting cup and remove the water, without damaging their sponge. Students with the “chewing” mouthpiece should attempt to break up and move their food pieces over to the collecting cup. After students try to gather food from their source using its respective mouthpart, have students try to collect food from sources using other mouthparts. Can some mouthparts be used for more than one food source? Have students record their observations about which mouthpart works best with each food source. Discuss feeding adaptations in the context of insect mouthparts.

Extensions:

Give students the option to come up with their own “mouthparts” for different food sources. Use whatever art supplies are on hand.

Insect Picnic

Name: _____

1) Long narrow cup of water

Tool used: _____

Insect example? _____

Observations: _____

2) Covered cup of water

Tool used: _____

Insect example? _____

Observations: _____

3) Wet sponge

Tool used: _____

Insect example? _____

Observations: _____

4) Small food items

Tool used: _____

Insect example? _____

Observations: _____

