

Better to Eat You With

Students play a game in which they pick up foods using tools that resemble the mouth parts of different animals.



Outcome

Students investigate how the structures of different mouth parts function.

For the Teacher

In the world of garden animals, for every menu there is a mouth that is specially adapted to enjoy it. Plant-eaters such as grasshoppers have mandibles that cut plant material and chew with a side-to-side motion. Nectar-eating animals have long, grooved or tubelike tongues or long skinny beaks that can reach into the base of blossoms. Insect-eating birds such as woodpeckers have long pointed beaks that can be used to bore into tree trunks. Birds such as sparrows use their beaks to nip new growth from plants. Earthworms' mouths simply need to open to allow soil to enter as they eat their way through their habitat. The proboscis of a mosquito is able to pierce the skin, inject anticoagulant, and then extract blood. Houseflies have spongy mouth parts that enable them to lap juices. Ants have ridged lips that enable them consume everything from deviled eggs to chocolate cake—picnic fare being, as everyone knows, their cuisine of choice. This dietary diversity and structural specialization within the animal world is the result of a myriad different survival strategies.



Indoor



Time
45 minutes

Related Subject
Math

Process Skills
Modeling
Communicating



Materials

For the Class:

- 1-meter (or 3-foot) piece of butcher paper
- bell or chime
- box of puffed rice cereal
- water
- food coloring
- What-We-Know-about-Garden-Animals List
- Questions-We-Have-about-Garden-Animals List

For Each Group of 4:

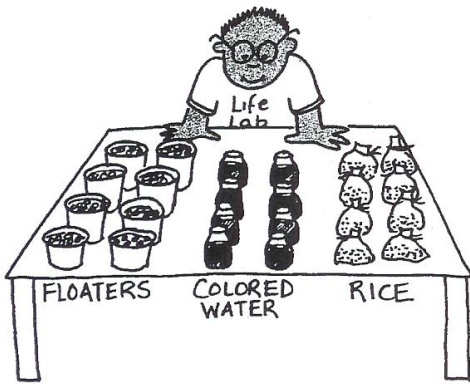
- a tiny spoon, such as those used for ice cream sampling, or a plastic teaspoon
- a drinking straw
- pair of tweezers
- small piece of household sponge
- piece of newspaper to cover work area
- 2 1-quart cottage cheese or yogurt containers
- small-mouthed container (juice bottle)
- 200 ml (or $\frac{3}{4}$ cup) of uncooked rice, popcorn, or similar-sized grain

For Each Student:

- small paper cup
- ruler (optional)
- Lab Book, pp. 159-160

Preparation

1. For each group, place 2 handfuls of puffed rice in a quart yogurt or cottage cheese container and fill with water. Fill the small-mouthed container with colored water. Mix uncooked grain with twice as much soil and place in yogurt container.
2. Make a classroom chart that corresponds to the Better to Eat You With lab sheet.
3. Place newspaper on tables or desks for each group of 4. If the activity is conducted outside, coverings may not be necessary.



Getting Started

Discuss what students have noticed about different animals' mouth parts during this unit.

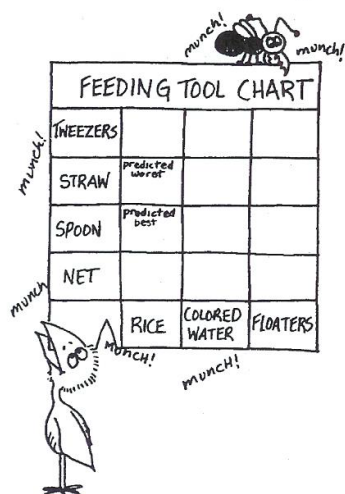
Do all the animals' mouths look the same? Why do you think they are different? Hold up the straw. What sorts of things would you eat if your mouth were shaped like this? What couldn't you eat? Have students discuss possibilities. Continue the discussion by holding up the other tools (spoon, tweezers, sponge) one by one and relating each one to mouth parts.



Action

1. Pass out a container of grain and soil, cups, and a set of tools to each group of 4 students. Each student will choose 1 of the tools to use for the duration of the activity.
2. Tell students to use the pictures on the Better to Eat You With lab sheet to match their tool to a particular type of mouth found on an animal. Students can share the reasons for their matches.
3. Ask students to keep the tools on the table until you signal the beginning of the game using a bell or chime. Tell students with straws that they must pick food up without using their mouths.
4. Have students place the container with the grain-soil mixture on the newspaper and predict which tool will pick up the most and which will pick up the least. Students should record their predictions on their lab sheets.
5. Tell students that when you give the signal, they may begin using their tools to pick up grain and put it in their paper cups. When you signal them to stop, they are to put their tools down.
6. Give the signal. After 45 seconds, signal students to stop. Students can compare the amount of food collected in each cup within the group and by measuring with a ruler. Students record the quantities from most (#1) to least (#4) on their lab sheets.
7. Pick up the grain container from each group. Distribute containers of colored water. Explain that this represents nectar, a liquid bees and some insects drink from plants. Repeat the predicting, testing, and recording.
8. Distribute containers of rice cereal in water. Explain that this represents food that birds such as pelicans might eat in a scooping motion. Repeat the predicting, testing, and recording.

9. On the classroom chart, help students create a bar graph for each tool comparing the amount of food they were able to pick up.



10. Reinforce students' understanding by asking them to complete question 2 on the lab sheet.



Assessment

Assess students' understanding of how different tools and foods correspond to different mouthparts and diets found in nature.

Which tool worked best for each type of food? Did your predictions match your findings? How does each tool correspond to animal mouth parts found in nature? Why is it important that animals are not all trying to eat the same thing? Different diets help to ensure survival of a wide range of species. For ex-

ample, caterpillars have different mouth parts and tastes than butterflies, so larvae and adults are not competing with one another for food. Direct students' attention to the two Garden Animals lists. Students can add questions and new information.

Digging Deeper

- Have students try using the tools to harvest food in the garden or to pick up and eat a class snack.
- Encourage partners to work together to find or make tools that resemble the mouth parts of the animals they have worked with in the garden. Suggest they test the tools by picking up foods the animals eat. Display the tools in the Life Lab Center.
- Encourage students to read about bird beaks in *The Life Lab Beat*. Suggest that the class make a poster out of pictures cut from magazines—different kinds of bird beaks and the different foods students have seen birds eat.

Teacher Reflections

- Were students able to make the connection that different animal mouthparts are suited for different foods?
- Were they able to infer what would happen if all animals had the same mouthparts?
- Were group members able to work cooperatively and exchange information with each other?

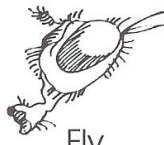
Better to Eat You With

Name _____ Date _____

1. Draw a line from the animal's mouthpart to the tool that is most like it.



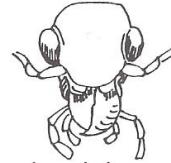
Butterfly



Fly



Duck



Ladybug



Spoon



Tweezers



Straw



Sponge

2. Draw a line from each animal to the food that it eats.

Nectar

Aphids

Wild rice
and bread
crumbs

Liquid

Better to Eat You With

Compare the tools in your group to find out which can carry the most of each substance. Put a 1 in that box. Put a 2 in the box of the tool that was next. Then give a 3 to the tool that followed, and a 4 to the tool that can carry the least amount of that food.

Feeding Tool Chart				
	Tweezers	Straw	Spoon	Sponge
Grain & Soil				
Water				
Floaters				

