

# Biology

## Core Activity

<p><b>Standard #</b> 3520-05 or 3520-07 Students will understand concepts of biological diversity. Or, students will analyze characteristics of ecosystems.</p> <p><b>Objective #</b> 3520-0501 or 0702 Relate the functions and structures of organisms to biological diversity. Or, Analyze ecosystems in relation to matter, cycles and energy flows.</p> <p><b>ILOs:</b> Make observations and measurements. Use reference sources to obtain information. Make estimations and predictions based on observations and current knowledge. Maintain a sense of curiosity about natural phenomena. Know science terminology appropriate to grade level. Oral reports describing the findings of investigation and reasons for conclusions. Provide relevant evidence to support inferences put forth to be accepted by others. Evaluate the findings and conclusions reported by other investigators.</p>	<p><b>Topic:</b> Diversity and Evolution or Ecology</p> <p>3520-05 or 3520-07</p>
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### Description of Activity

*Activity Title:* My What Big Teeth You Have

*Activity Overview:* Students will use the skulls of different animals to investigate and compare structure versus function and then predict each animal's role in a food chain.

*Duration:* 40 to 50 minutes

### Materials, Facilities and Resources:

Skulls of different animals, i.e., fish, amphibians, reptiles, aves or mammals (skulls may be all of one group or a variety of groups). Skulls may be collected, purchased or borrowed. Check with the Natural History Museum at the U of U, or local University. You may also need rulers and a mammal identification book.

### Background Information

Skulls can be compared by looking at dental formulas (number of teeth on the upper and lower jaw), types of teeth (molars, premolars, canines, incisors) and the comparison of any number of bones found in the skull (e.g., the length of nasal bones, thickness of bone, size of orbitals, etc.)

## Teaching and Learning Strategies

Depending on the number of skulls that are available, you can either group students into small groups (3-4 students per group) and give them 3-4 skulls to investigate and compare, or you can set up individual stations and have students go to each station and investigate and compare each skull. After each group makes their conclusions have another group verify those conclusions.

## Invitation to Learn

*Problem:* Begin by reading the following scenario or use one of your own.

"Imagine that you've been hiking in the rugged canyons of southern Utah for several hours when you finally reach your destination, a beautiful desert pond. Immediately, you feel the uniqueness of this desert oasis. You are alone, no one else is around. The vegetation is not trampled and there is no trash to be seen. It's so quiet; all you hear is the wind in the grass, the song of a bird, and the occasional chirping of a cricket.

Walking more slowly now, you scan the pond's edge, looking for a place to rest. Ahead of you some whitish objects catch your eye. Are they desert flowers? Rocks? As you get closer, you see that they aren't flowers or rocks. Then you wonder if perhaps they could be pieces of weathered wood. No! They're skulls! Skulls of various sizes are scattered all around the area. Curious, you pick up the nearest skull. As you begin to examine it, you notice that some of the other skulls look very different from the one in your hand. One by one you examine several of the skulls. You wonder; What animals are they from? What can I learn about an animal by simply observing its skull?"

Tell students that it is the job of each group to learn as much as they can about these animals from the investigation and comparison of several of these animal skulls. Each group will provide an oral and written report of what they learn about each animal and what they predict each animal's role is in a food chain. A second group of students will verify the first group's results and conclusions.

*Safe Operating Procedures:* Most skulls are fragile. Instruct students to handle skulls carefully if handling is required. Have students wash hands after handling skulls.

## Summary of Learning

The following questions may be used to assess learning:

1. What bones in the skull can you name?
2. What different types of teeth do animals have?
3. Is it possible to tell what kind of animal you have from just the skull? Explain.
4. What unique shapes, bumps, grooves, openings and surfaces are particular to each skull?
5. What functions does the skull serve?
6. Give at least one example of how The structure of a skull relates to its function.
7. Make a chart listing each skull investigated and include the following:
  - A. List at least 4 features of this skull that might give you clues about the animal.

- B. Interpret these clues. What do they tell you about the animal?
- C. What are some of the functions of the skull you are investigating?
- D. What animal do you think this skull is from? Give reasons for your answer.
- E. What other animal(s) could this skull possibly be from?
- 8. List at least three things all the skulls you investigated had in common.
- 9. List at least three ways that the skulls differed from each other.
- 10. What kind of things can you tell about an animal by looking at its skull?
- 11. Circle the items on this list that you could determine by looking at the animal's skull.
  - A. What genus it belongs to.
  - B. What species it belongs to.
  - C. Its size.
  - D. Its diet.
  - E. Its eye color.
  - F. Its weight.
  - G. Whether it's male or female.
  - H. How intelligent it is.
  - I. If it could fly.
  - J. Its age.
  - K. What sounds it makes.
  - L. If it were sick or healthy.
  - M. If it lived in water or on land.
  - N. Its favorite food.
  - O. If it is nocturnal.
- 12. If you really did find an assortment of skulls near a desert pond, you probably would wonder how those bones got there. Give at least two possible explanations.
- 13. Which of the following would you NOT be able to determine by looking at an animal's skull?
  - A. The animal's diet.
  - B. The type of animal.
  - C. The animal's age.
  - D. The animal's eye color.
  - E. The animal's size.
- 14. Animals can have all of the following tooth types EXCEPT?
  - A. Postmolars.
  - B. Canines.
  - C. Premolars.
  - D. Incisors.
  - E. Molars.