

RESOURCE LIBRARY
ACTIVITY : 45 MINS

Big Cats, Big Teeth

Students compare the shape and size of human, lion, and gazelle teeth and jaws. Then they predict what each animal eats and decide if the animal is a meat-eater, plant-eater, or an omnivore.

GRADES

K, 1, 2

SUBJECTS

Biology, Mathematics

CONTENTS

2 PDFs

OVERVIEW

Students compare the shape and size of human, lion, and gazelle teeth and jaws. Then they predict what each animal eats and decide if the animal is a meat-eater, plant-eater, or an omnivore.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/big-cats-big-teeth/>

Program

DIRECTIONS

1. Activate students' prior knowledge about big cat predators and their prey.

Discuss with students what they think of when they hear "big cats." Ask: *What pictures or words do you think of when I say "big cat"? What are some types of big cats that you can think of?* Elicit from students that big cats include lions, tigers, leopards, cheetahs, and other large predatory cats. Distribute the worksheet Big Cats Tooth Comparison and have students examine the images of the skulls. Ask: *What types of animals do you think these are? How do you know?* Elicit from students that one is a human, one is a meat-eating lion, and the other is a plant-eating gazelle. Tell students to look at the differences in the shape and size of the animals' teeth and jaws. Discuss their observations. Explain that in the wild, the lion is a predator and the gazelle is its prey. Ask: *What is prey?* Explain that prey are animals that are hunted and eaten by other animals. Ask: *What are predators?* Explain that predators are meat-eaters that feed on other animals. The shape and size of a lion's teeth and jaws help it to be a successful predator.

2. Have students predict how their teeth and jaws compare to those of a lion.

Prompt students to list what they ate for breakfast or lunch. Write their responses on the board. Ask volunteers: *Are you a meat-eater or a plant-eater?* Elicit from students that most humans eat both plants and animals. Explain that an animal that eats a variety of organisms, including plants and animals, is an omnivore. Humans are omnivores so their mouths are designed to eat both meat and plants. Tell students that they are now going to make predictions about how their teeth and jaws compare to those of a lion. They will test their predictions by collecting more information. Read aloud the worksheet directions for Part 1: Prediction. Allow students time to make their predictions and complete Part 1.

3. Have students collect more information to test their predictions.

Divide students into small groups. Read aloud the worksheet directions for Part 2: Observations. Have students work in small groups and use mirrors to observe their teeth and mouths so they can sketch and describe the shape of their teeth. After students have sketched and described the shape of their front teeth (incisors), canine teeth, and back teeth (molars), have them measure the size of one group member's canine teeth. Help them to correctly identify their canine teeth. Explain that if they find their two front teeth and go two teeth to the right or left, then they have found their canines. Then have students compare the size of human canine teeth to the size of lion canine teeth. Facilitate students as needed and encourage them to use the reference images provided on their worksheets.

4. Use the provided answer key to discuss students' observations and predictions.

After students complete Part 2 of the worksheet, use the provided answer key to discuss their findings as a class. Ask students if their predictions were correct. Ask: *Is a lion's jaw bigger than a human's? Are a lion's teeth bigger than a human's? Are all of the lion's teeth the same shape? How does the shape of a human's teeth compare to a lion's?* Elicit from students that the lion's teeth and jaws are much larger than a human's, but some of the shapes are similar. For example, humans and lions both have smaller, smoother front teeth (incisors) and sharp, pointed canine teeth. However, the shape of a human's back teeth (molars) is quite different from a lion's. Humans have back teeth that are rounded and bumpy, and lions have back teeth that are sharp. Ask students to compare the amount of teeth lions and humans have. Explain that adult lions have 30 teeth and adult humans have between 28 and 32. As kids, however, humans only have 20 teeth and they are temporary, or "baby" teeth. Ask students to compare the size (length) of their canine teeth to those of lions and adult humans. Adult lion canines are about 10 centimeters long and adult human canines are a little more than 1.5 centimeters long.

5. Have students reflect on similarities and differences between human and lion teeth.

Have students reflect on what they learned from their observations. Tell students to think about why human teeth are similar to and different from lion teeth. Have students share aloud the similarities and differences they observed. Facilitate the discussion. Ask: *Why is the shape of a lion's back teeth so different from a human's?* Elicit from students that the large size and sharp, pointed shape of a lion's teeth are used to shred and tear the meat they eat. Humans' flat, bumpy back teeth are used for grinding up food, especially plant material, such as vegetables, beans, and nuts. Ask: *What teeth do we humans use to tear and eat meat?* Elicit from students that we use our front teeth and canines to bite down and tear meat. Lions don't need grinding teeth because they don't really chew their food. They just tear it, break it into smaller chunks, and swallow it. Ask: *How do the shape and size of the gazelle's jaw and teeth help it eat?* Students should be able to explain that the gazelle's jaw is long and narrow and contains a lot of flat, bumpy teeth like human back teeth (molars). Ask: *Based on this observation, can you predict what gazelles eat?* Elicit from students that the gazelle's teeth are flat and round, and therefore used for grinding up tough plant material like grass and shrubs. Students should understand that the shape and size of an animal's teeth and jaw have evolved to help it eat specific types of plant and/or animal material.

Tip

For Step 3, the data collection portion of the activity, try to group students so that each group contains a student that has canine teeth they can measure.

Informal Assessment

Review students' completed worksheets and responses to discussion questions to assess their comprehension.

Extending the Learning

Have students do the activity again, using a different big cat predator for comparison.

OBJECTIVES

Subjects & Disciplines

Biology

- Mathematics

Learning Objectives

Students will:

- compare and contrast the size and shape of human jaws and teeth to those of a lion and gazelle
- predict what an animal eats based on the size and shape of its teeth and jaws

Teaching Approach

- Learning-for-use

Teaching Methods

- Discussions
- Hands-on learning
- Information organization

Skills Summary

This activity targets the following skills:

- Critical Thinking Skills
 - Analyzing
 - Understanding

National Standards, Principles, and Practices

NCTM PRINCIPLES AND STANDARDS FOR SCHOOL MATHEMATICS

- Algebra (preK-2) Standard 1:

Understand patterns, relations, and functions

- Geometry (preK-2) Standard 4:

Use visualization, spatial reasoning, and geometric modeling to solve problems

- Measurement (preK-2) Standard 1:

Understand measurable attributes of objects and the units, systems, and processes of measurement

- Measurement (preK-2) Standard 2:

Apply appropriate techniques, tools, and formulas to determine measurements

NATIONAL SCIENCE EDUCATION STANDARDS

- (K-4) Standard A-1:

Abilities necessary to do scientific inquiry

- (K-4) Standard C-1:

The characteristics of organisms

- (K-4) Standard C-3:

Organisms and environments

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Hand mirrors
- Pencils
- Rulers

PHYSICAL SPACE

- Classroom

GROUPING

- Large-group instruction

BACKGROUND & VOCABULARY

Background Information

Lions are one of the largest big cats and are well adapted to be successful predators. As carnivores, the shape and size of their jaws and teeth are designed to help them tear and shred their prey. Their skulls are large and thick to support strong jaw muscles and large canine teeth, up to ten centimeters in length. Unlike humans (omnivores) and herbivores, lions cannot move their jaws from side to side and they lack molars that are suitable for grinding and digesting plant material.

Prior Knowledge

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Recommended Prior Activities

- None

Vocabulary

Term	Part of Speech	Definition
Big Cats Initiative	<i>noun</i>	National Geographic Society program that supports on-the-ground conservation projects, education, economic incentive efforts, and a global public-awareness campaign to protect big cats and their habitats.
omnivore	<i>noun</i>	organism that eats a variety of organisms, including plants, animals, and fungi.
predator	<i>noun</i>	animal that hunts other animals for food.
prey	<i>noun</i>	animal that is hunted and eaten by other animals.

For Further Exploration

Websites

- [National Geographic Animals: African Lion](#)
- [National Geographic Animals: Big Cats Initiative](#)
- [Encyclopaedia Britannica: Feline](#)
- [Encyclopaedia Britannica: Human Digestive System—The Teeth](#)



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