

ANIMAL BITES

Lesson Plan

ANIMAL BITES

OBJECTIVE

The Animal Bites Kit utilizes teeth and mandible fragment replicas to give students a unique insight into the diversity of diet within the animal kingdom. The materials provided are ideal for the exploration of differences and adaptability that occur in nature.

Upon completion of this activity, students should be able to (1) understand the dietary differences between the three major animal classifications: herbivore, carnivore and omnivore, (2) understand the types of foods that animals eat and (3) understand that an animal's tooth structure is specifically designed for the type of food it eats.

MATERIALS PROVIDED

- Information on dietary differences that occur in nature
- 9 Tooth and Mandible Fragment Replicas
 - Hippopotamus Tooth
 - Beaver Mandible Fragment
 - Mountain Gorilla Mandible Fragment
 - Coyote Mandible Fragment
 - Alligator Tooth
 - African Lion Mandible Fragment
 - Human Maxilla Fragment
 - Grizzly Bear Mandible Fragment
 - Baboon Mandible Fragment
- Detailed information on each animal featured
- Suggested exercises and projects
- Detailed exercise sheet

Dietary Differences that occur in Nature

Animals can be classified (put into groups) according to the kinds of foods they eat. The main groups are herbivore, carnivore and omnivore: herbivores feed chiefly upon plants or vegetables, carnivores feed chiefly upon animal flesh and omnivores feed upon both animal and vegetable matter.

Carnivores

Because a carnivore feeds mainly upon meat, its teeth were specifically designed to perform the necessary stabbing, ripping and tearing. It is easy to identify a carnivore by its teeth. The teeth of a meat eater are highly specialized. Carnivores utilize long, sharp canines (sharp, front teeth) to seize and kill, and blade-like cheek teeth to cut and chew. The placement of the cheek teeth on the lower (mandible) and the upper (maxilla) jaws assure the carnivore efficient and precise cutting action. The lower jaw (mandible) of a carnivore is firmly attached and specially designed for chewing in an up and down motion.

Carnivores play a major role in controlling populations of other types of mammals, especially rodents and larger herbivores.

The African Lion

The African Lion is a carnivore and its teeth reflect a tendency to feed chiefly upon meat. Its dentition (teeth structure) consists of canines (sharp, front teeth) for stabbing, seizing and killing, and cheek teeth (side and rear teeth), shaped like blades, for tearing and slicing. A lion also relies on sharp fore claws (hand claws) to capture and hold prey (hunted animals). Generally, it is only after the prey has been seized with one or both fore claws that the cat takes its first bite. Lions are nocturnal (night predators) and usually hunt in packs (groups of 2 to 15). On average, a lion eats about 13 percent of its body weight, per day, in the form of wild game. In the wild, it can eat up to 70 pounds in one sitting. A lion's food preference is wildebeest, zebra and Thompson's gazelle.

The Alligator

The alligator is a member of the reptile family, and is classified as a carnivore. This large, quick moving beast possesses many sharp, pointed teeth. When the alligator's mouth is closed, the teeth on the lower jaw (mandible) fit snugly inside the row of teeth on the upper jaw (maxilla). This makes for efficient and effective biting and chewing. An alligator is found only in tropical areas. It lives on river banks and in swamps. An alligator feeds not only on other swamp and river animals, but also upon shell fish and insects.

The Coyote

The coyote is a member of the wolf family and is classified as a carnivore. Coyotes primarily make their home in North America, living in wooded areas from Alaska to Central America. The coyote's muzzle (mouth) is long and narrow. It possesses long canines (sharp, front teeth) for stabbing, seizing and killing, and blade-like cheek teeth for tearing and slicing. Much of the coyote's diet consists of field mice, ground squirrels and insects, although it has been known to attack sheep, antelopes and even dogs and cats.

Omnivores

Certain meat eaters are classified as omnivores. An omnivore is an animal which eats both meat and vegetable matter. Generally, this type of animal possesses blunter (less sharp) canine teeth, and flatter cheek teeth. The flatter cheek teeth are better suited for the grinding and chewing of vegetable matter.

The Human

As you probably know, from your own diet, humans are considered omnivores. Their teeth are designed with sharp canine teeth for the ripping and tearing of meat, and molars (flatter rear teeth with larger surfaces) for the crushing of vegetables and fruits. Although human dentition (teeth structure) is designed for eating both plants and animals, some humans have made a conscious choice to avoid all meat products and exist on a diet consisting entirely of vegetable and fruit products. A humans' diet consists of the widest range of food of any animal in nature.

Grizzly Bear

The grizzly bear is an omnivore. It lives in Alaska, Canada and the northern United States. The grizzly eats a combination of animal meat, berries, honey, seeds, leaves and, today, garbage from camp sites. The grizzly bear's canine teeth (large front teeth) were designed to be pointed and sharp. These teeth are chiefly utilized to assist with the stabbing and tearing necessary for eating meat. Its molars (rear teeth) have larger, flatter surfaces, suitable for the crushing and mashing of plant life, such as: nuts, berries and leaves. The grizzly bear possesses an extremely strong jaw that enables it to crush an elk's skull as if it were an egg shell. Grizzlies are known as the largest living land carnivores. They can weigh over 1700 pounds and grow to heights of over nine feet.

The Baboon

The baboon is an omnivore. It possesses teeth that are specially designed to eat both meat and plant matter. Its sharp, projecting canine teeth (large front teeth) are exceptionally long and pointed, enabling this 40 pound primate to defeat predators twice its size. Its premolars (rear teeth immediately behind the canines) are enlarged and compressed laterally (backward) to form a cutting edge which shears (cuts) against the upper canines. A baboon's molars (back teeth) have larger, flatter surfaces, suitable for the crushing and mashing of plant life. A baboon eats a variety of fruits, vegetables, hares (rabbits), birds, young antelopes and other small monkeys.

Herbivores

An animal classified as an herbivore feeds primarily on plant matter. Most herbivores have no canines and others have small blunt canines. An herbivore's jaw is designed specially for side to side movement. This helps in the grinding and crushing of fibrous plant material. The molars in some herbivores are joined by crests (high points) which are perpendicular (at an angle) to the direction of the jaw motion. This type of molar is called a selenodont, and is exhibited by cows. Other herbivore molar crests are parallel (running the same direction) to the side to side movement. Mice and other rodents have this kind of molar called a lophodont.

The Gorilla

The gorilla is an herbivore. Its natural habitat is in the jungles of Africa. An adult gorilla is a very large animal, sometimes weighing over 600 pounds. A gorilla must eat constantly (all the time) to maintain its bulk (size and weight). A large part of its diet consists of shoots and juice stalks, and a gorilla's teeth reflect the design necessary to devour (eat) this fibrous material. A gorilla's canines are large, but blunt, and its molars are large and flat. A gorilla lives almost entirely on the ground, although young males and females climb trees in search of fruit to throw down to the older animals.

The Hippopotamus

The hippopotamus is a herbivore. It lives along the tropical rivers and lakes throughout West and East Central Africa. The adult hippopotamus weighs up to five tons and can reach the length of fifteen feet. It spends most of the day in deep water, either entirely submerged or with its eyes, ears and nostrils barely above water. A hippopotamus feeds at night. It grinds plant matter with its round, flat back molars, enabling it to be swallowed with ease. Its lower canines can grow

very long - sometimes over three feet long with weights up to seven pounds. These canines are not used in chewing, so they escape the wear of grinding and remain long. The hippopotamus' favorite food is short grass. By keeping the grasses well trimmed they may help to deter grass fires. Every evening the hippos move from the river or lake to the grassy plains for their food. They create paths in the vegetation providing other animals easy access to the river or lake for drinking water.

The Beaver

A beaver is an herbivore. It lives throughout Europe and North America - generally building its burrow (home) near the flowing waters of streams and rivers. The beaver has very specialized teeth, enabling it to chew through branches and twigs like an ax or a saw. It uses these materials to construct its burrow. The beaver has four large incisors (front teeth), two in the upper jaw (maxilla) and two in the lower jaw (mandible). Its lower incisors never stop growing, but are kept from getting too long by the constant gnawing (chewing) of branches and twigs. There is a wide gap between the large incisors (front teeth) and the flat molars. This allows the incisors to chop the plant matter which then passes easily to the molars, which crush it. Beavers eat pond lilies and the bark of aspen and birch trees.

Tooth Kit Exercises

Divide your class into between 4 and 9 groups. NOTE: make sure you have made enough copies of the animal information and the exercise sheet to give one copy to each group.

Pass out a tooth replica, the animal information and an exercise sheet to each group.

Ask each group to look at and touch their tooth replica. Have them pay close attention to the shape and feel of the replicas.

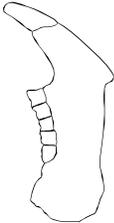
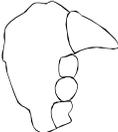
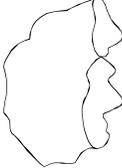
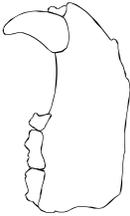
Ask them to decide to which dietary group their tooth belongs. Have them write their answer in the appropriate blank on the exercise sheet. Allow them to read the animal information for clues.

Ask them to discuss from which animal their tooth replica belongs. Have them fill in the appropriate blank on the exercise sheet with the correct animal name.

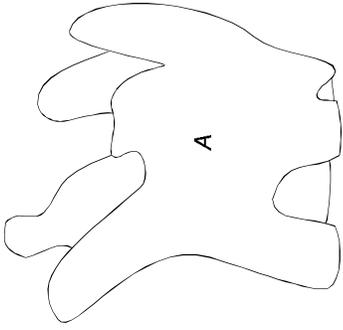
Ask them to decide upon 3 foods eaten by this animal, and list them on their exercise sheet.

Have each group exchange their tooth replica for one they have not studied and repeat steps 2 - 4. NOTE: Do not let your students see the labeled tooth diagram until they have attempted to fill out their exercise sheet.

Exercise Sheet

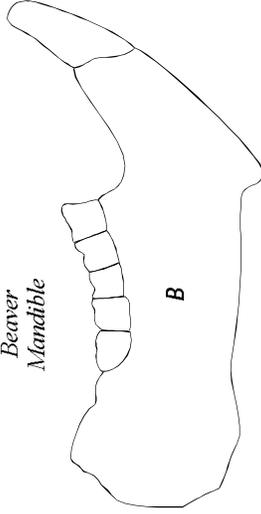
		Dietary Group	Name	Three foods eaten by this animal
A				
B				
C				
D				
E				
F				
G				
H				
I				

Hippotomus

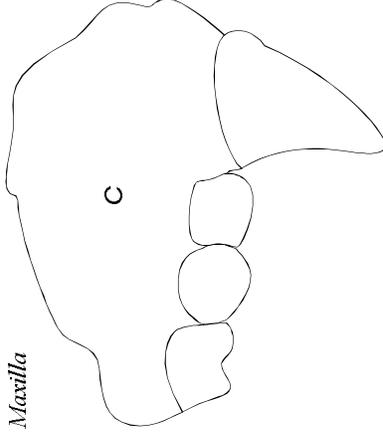


HERBIVORES

Beaver Mandible

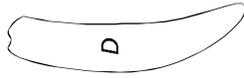


Mountain Gorilla Maxilla

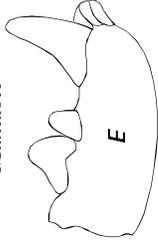


CARNIVORES

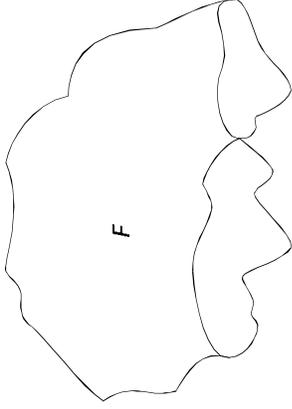
Alligator Maxilla



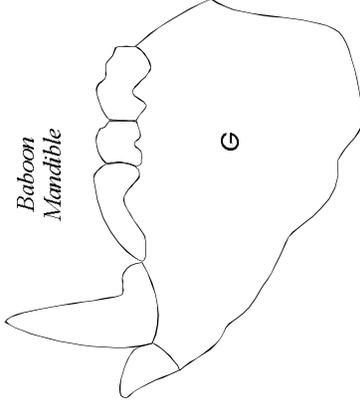
Coyote Mandible



African Lion Maxilla

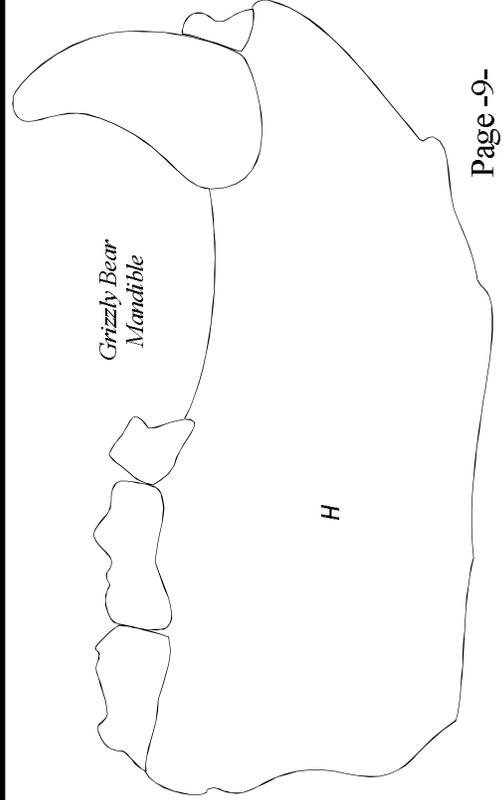


Baboon Mandible

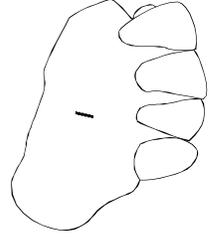


OMNIVORES

Grizzly Bear Mandible



Human Maxilla



Bibliography

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- MacDonald, David (ed.). *The Encyclopedia of Mammals*. Vol. 2. London: George, Allen & Unwin, 1984.
- Parker, Sybil P. (ed.). *Grzimek's Encyclopedia of Mammals*. Vol. 5. New York: McGraw-Hill, 1990.

Educational Kits and Supplies

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0931-3 Dino Traces, Triceratops	\$55.00	Shipping	\$8.00
0932-3 Dino Traces, Tyrannosaurus rex	\$55.00	Shipping	\$8.00
0950-3 Human Traces.....	\$55.00	Shipping	\$8.00
0960-3 Animal Bites	\$95.00	Shipping	\$8.00
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