

Skins and Skulls

By exploring skull characteristics and specific evidence left behind by animals, students will learn animals have specific eating habits being carnivores, herbivores, and omnivores.

Grade Level: 4th Grade

Phenomena: How do organisms vary in their traits?

Objectives:

- Students will define the terms carnivore, herbivore, and omnivore.
- Students will analyze the eating habit of an animal by examining a skull's dental structure.
- Students will list three animals that exhibit each eating habit.
- Students will describe three types of evidence animals can leave behind to be studied.

Materials:

- 1 carnivore, 1 herbivore, & 1 omnivore skull
- 3 small dry erase boards
- Variety of skins & pelts
- Animal pictures to match the skins & pelts
- Models of scat that match skins & pelts
- Track casts that match the skins & pelts.

Time Considerations:

- Preparations: 10 minutes
- Activity 1: 8 minutes
- Activity 2: 15 - 20 minutes
- Activity 3: 8 - 10 minutes
- Activity 4: 10 minutes
- Conclusion: 5 minutes

Related Lesson Plans:

Animal Tracks
Mud Fossils
BRR! Bring on the Snow Blanket



Nevada Academic Content Standards—Science

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Science and Engineering Practices (SEP):

Developing and Using Models
Engaging in Argument from Evidence

Disciplinary Core Ideas (lesson specific):

LS1.A Structure and Function

Crosscutting Concepts:
Cause and Effect

Background

Scientists study the intricate habits and behaviors of animals throughout their lives. Studies reveal mating rituals, defensive behaviors, bonding periods between mothers and offspring, as well as migration patterns. A vast amount of information can be learned about animals when they are alive. But when they die, does the learning continue?

Yes! Scientists continue to learn about animals from their remains. The skeleton provides lots of information about the animal's general health, cause of death, age, species, evolutionary traits, eating habits, etc.

To determine an animal's

Excellence in Environmental Education Guidelines

Systems and System Models

Strand 1—Questioning, Analysis, and Interpretation Skills (A, B, C, G) Learners are able to develop question, design investigations, collect information, and draw conclusions in order to learn about the environment.

Strand 2.2—The Living Environment (B):

Learners understand that plants and animals have different characteristics and that many of the characteristics are inherited

eating habits scientists focus on the skull, specifically the dental structure and jaw. Teeth are designed to grind or tear food into more manageable pieces to begin digestion. Jaw movement provides the mechanical means of breaking food into those small portions. Key characteristics of the teeth and jaw helps scientists to determine whether an animal is a carnivore, herbivore, or omnivore.

A carnivore is an animal that consumes other animals to fulfill its nutritional needs. Such animals include badgers, alligators, sharks, and mountain lions. The tooth structure and jaw movements are very specialized to rip, tear, and shred muscle and

tissue.

Animals that consume only plants are called herbivores. Herbivores have flat molars that are used to grind plant matter. The grinding motion is allowed due to a jaw structure that allows horizontal movement. Herbivores include deer, cows, elk, zebras, and horses.

Animals that consume both meat and plants are called omnivores. The canine and incisor teeth are blunt when compared to carnivores and the molars are flatter to allow for grinding to happen. Omnivores include bears, raccoons, and skunks.

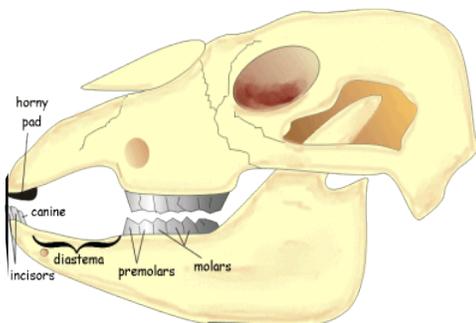


Fig. 1—Herbivore Skull
Longley, S.. (2005). In *SchoolNet: Moodle*.
(chap. 10/Mammalian Teeth - Dentition)

Preparation

Allow at least ten minutes to set up materials in the classroom prior to the start of the lesson.

Locate an open area in the classroom big enough for all students to sit down in a circle comfortably. In this area, place a tub that contains carnivore, herbivore, and omnivore skulls, three small dry erase boards, and markers. Use a cloth to cover these so not to distract students from the introduction.

Keep all other pieces of

Doing the Activity

evidence covered during the class. There will be enough time to set up Activity Four as you explain the goals and create groups for it.

Activity 1: Animal Evidence (SEP: Engaging in Argument from Evidence)

Begin the lesson by having students brainstorm what types of evidence animals leave behind that provide scientists with information about them. (scat, tree markings, bones, fossils, and dens) Provide scenarios to the class if they are struggling.

Record their ideas on the board and ask what information scientists can gain from this evidence. (size, eating habits, movement etc.)

Activity 2: Skull Features & Comparison (SEP: Engaging in Argument from Evidence)

As the students move into a circle ask them to think about what an animal could leave behind that would give clues to how it ate. Have students sit in a circle in an open area in the classroom. Once everyone is seated, have students share ideas.

Explain that an actual piece of evidence will be passed around the group. Students are to examine it, in an effort to learn about the animal's past eating habits.

Begin by revealing the carnivore's skull. Before passing it around, emphasize to the students that the specimens are fragile and should be treated with respect.

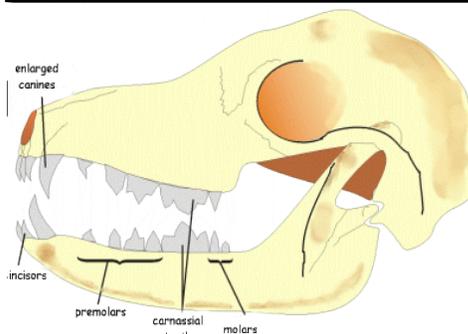


Fig. 2—Carnivore Skull
Longley, S.. (2005). In *SchoolNet: Moodle*.
(chap. 10/Mammalian Teeth - Dentition)

Ask the students to make observations about the skull and hypothesize about the type of animal it could be. Once the skull has been passed back to you, have students describe the skull, keeping in mind their goal. Write their responses on a small white board labeled "Skull A".

Pass around the herbivore skull next and write their responses on a second, small white board labeled "Skull B". Again, remember not to say the species name.

Pass around the omnivore's skull and record students responses in the same fashion.

Conclude this activity by emphasizing key observations made by the students. Then dismiss students back to their seats for the next activity.

Activity 3: Eating Habits (SEP: Engaging in Argument from Evidence)

Transfer the notes taken in the last activity to the main classroom board or prop the small whiteboards up so students can see and read them.

Ask the class to identify the most noticeable difference between the three skulls: the teeth! Based on their observations of the teeth, ask what type of food did each animal eat or what type of “eater” the animal was, when it was alive? Most likely answers are meat-eaters, plant-eaters, and both.

Introduce the terms carnivore, herbivore, and omnivore to the class. With each term have students create a hand motion to help commit the new word to memory.

Hand motion ideas:

- Carnivore: place wrists together with fingers curled inward to represent the sharp teeth of a carnivore. Move “teeth” up and down in a biting motion
- Herbivore: use the same wrist placement as above, but this time curl fingers to make a fist. The back, flat side of your fingers represents the flat teeth of an herbivore.
- Omnivore: use the same wrist placement as above, but this time leave the bottom fingers stretched out and the top fingers curled inwards. This shows how omnivores have both sharp and flat teeth.

Explain how teeth are designed

to chew a specific way. Teeth of a carnivore are sharp because they rip meat from the bone. An herbivore has flat teeth, which are used to grind plant material to bits. At this point have students use their tongue to feel their teeth. Are human teeth sharp, flat, or both? Have students show what type of eater they think they are using the hand motions.

Finally, return to the skulls and reveal what their true identities are to the class.

Review with students the three types of eating habits, using the hand motions. Quiz students by asking them to identify other types of animals that may be a carnivore, herbivore, or omnivore.

Activity 4: Other Clues

(SEP: Engaging in Argument from Evidence)

Remind students that animals leave many types of evidence

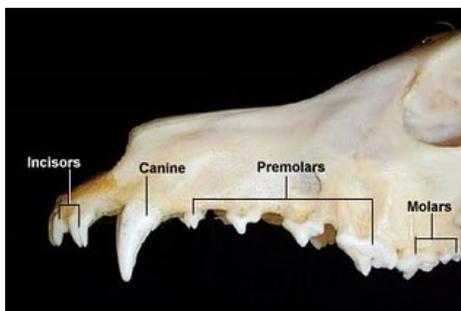


Fig. 3—(2010, Feb. 11). In *Health knowledge made personal*. (Blog Posts/Health Bloggers: REVIEW OF PET DENTAL DISEASE)

behind, that allows us to study their eating habits. Explain in this next activity, students will examine many types of evidence to determine the eating habit of an animal. State your expectations on how

specimens should be treated and how students should behave while in groups. Place two or three specimens (of the same animal including scat, hide, tracks, or picture) at a specific spot around the room. As these stations are set up, bring three to four students over and direct them to wait until all groups are ready to begin. Allow groups three to four minutes to

Conclusion

explore their objects.

Gather each group's attention and have students stand with their hands held behind their backs. Tell groups they are to show you the eating habit at their station, by using the appropriate hand motion created earlier. Review these hand motions, do a countdown, then reveal the eating habit! Use this tool to assess student's ability to gather and interpret information found in the evidence before

Assessment

them.

Conclude this lesson by with students using their hand motions to the names of other animals. It is important for all students to start with their hand behind their back. This prevents students from copying the motions of their classmates. Assess student understanding of eating habits by their transition in speech, from using the terms meat-eaters to carnivores and so on. Listen for students to incorporate these terms in small group or class discussions.

Assess students' ability to

Extensions

connect the eating habit of an animal to the type of dental features in a skull. An opportunity for this to happen is in *Activity 4: Other Clues*. Students should be able to identify that sharp, pointy teeth are that of a carnivore; large, flat teeth are that of a herbivore; and a skull that has both of these types of teeth is that of an omnivore.

Visually assess students' ability to identify common animals' eating habits, through the hand motion activity. This is mostly done in *Activity 4: Other Clues* and during the *conclusion*.

- **Drawing the Evidence**
Explain to students that when scientists gather enough information about an

animal, they are able to draw conclusions to how that animal once lived. These conclusions include eating habits, habitats, size, etc. On a clean sheet of paper, tell students to make conclusions just like these scientists.

Students need to first choose one animal they studied from the stations. Based on the clues at the station, students will draw the following conclusions of the animal:

- 1.Habitat
- 2.Size (the animal)
- 3.Food source

Vocabulary

Carnivore: an animal that eats meat.

Herbivore: an animal that eats plants rather than other animals.

Omnivore: an animal that eats both plants and meat.

Sources

- Glathal, J. B, & S. Wolinsky. (1996). Scholastic Children's Dictionary. New York, New York: Scholastic Inc..
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Retrieved Nov. 2, 2010, from <http://www.wellsphere.com/pet-health-article/review-of-pet-dental-disease/1007950>
- Longley, S.. (2005). In *SchoolNet: Moodle*. (chap. 10/Mammalian Teeth - Dentition) Retrieved Nov. 3, 2010, from <http://moodle.schoolnet.lk/course/view.php?id=21>

Images:

Fig. 1. *Herbivore Skull* Longley, S.. (2005). In *SchoolNet: Moodle*. (chap. 10/Mammalian Teeth - Dentition)

Fig. 2. *Carnivore Skull* Longley, S.. (2005). In *SchoolNet: Moodle*. (chap. 10/Mammalian Teeth - Dentition)

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