Mammals of Colorado Skulls Exploration Kit

Lesson Plan
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Summary: Students will learn physical characteristics that distinguish mammalian carnivores, herbivores, and omnivores. Through instructor-led discussion and hands-on exploration, students will work in pairs to classify (replica) mammal skulls. Students will demonstrate understanding and share their knowledge by creating a "skull museum".

Materials:
Skulls: each skull comes bagged in plastic in its own box. Please return each skull to its bag and box when done. Each skull is labeled with its latin intials. Example: Beaver skull labeled C.c for *Castor canadensis*

1. beaver (*Castor Canadensis*)
2. jack rabbit (Lepus townsendii),
3. coyote (*Canis latrans*)
4. striped skunk (*Mephitis mephitis*)
5. raccoon (*Procyon lotor)*
6. house cat (*Felis domesticus*)
~~7. human (*Homo sapiens*)~~
8. whitetail deer (*Odocoileus virginianus*) – note that we have Mule Deer more prevalently)
9. gray fox (*Urocyon cinereogenteus*)
10. bobcat (*Lynx rufus*)
11. black bear (*Ursus americanus*)
12. mountain lion (*Felis concolor*)
13. River otter (*Lontra Canadensis)*
14. Pika (*Ochotoa collaris*)
15. Little Brown Bat *(Myotis lucifugus)*

Other materials: photos of each animal, name labels for each animal, predator/prey labels and carnivore/ herbivore/omnivore labels, complimentary CDOW pencils, field guides to mammals.

**Students should bring rulers with them, and clipboards if tables are not available.

Procedure:
1. Have students remind you of the 5 categories of vertebrates and then describe "what makes a mammal a mammal" (live birth, produces milk for young, hair or fur, warm blooded, vertebrate).

2. Explain that we'll be further categorizing some mammals, based on what they eat. We'll use plastic replica skulls for this investigation (so students that cannot touch bones for spiritual reasons may feel comfortable working with these model skulls)

3. Help students define: herbivore, carnivore, omnivore, and show tooth styles (use cardstock "cue cards"), using example skulls: mountain lion skull, deer or beaver skull, bear skull. Don't tell students what these skulls are!

4. Help students define predator and prey, and show students the eye placement on each of the example skulls. Predators rely on binocular vision for depth perception. They have "eyes in front, ready to hunt". Prey animals rely on wide peripheral vision (so they can see predators coming from any direction!), and they have "eyes on the side, ready to hide."

5. Show students the differences in skull noses, and help them speculate on animals' dependence on smell or vision or both. (heavy use of eyes, bear heavy use of nose…)

6. Worksheets and skull lab: Using human skull as a demonstration, explain that students will be working in pairs to complete their skull worksheets. They will measure the skull, sketch it, and determine what their animal eats (carni-omni-herbi), whether it is a predator or prey (or both!), and hypothesize what animal it is. Hand out a worksheet to each student, and a skull and field guide to each pair of students.

7. Creating the skull museum: After students complete their worksheets and determine which animal's skull they have (and confirm with the instructor!) they should create their skull museum exhibit. They should find the animal's picture and three labels (name, carn/omni/herbi, and pred/prey), and arrange the skull and these materials around it in an organized way. Some students may wish to create a "cats museum wing" and line up all the feline skulls. They can do the same for dogs/canids, or herbivores, etc.

8. Once every team has their exhibit done, have the entire class circulate through the classroom viewing the skull museum.

9. Wrap up with a group assessment: What characteristics distinguish mammal skulls from each other? If there are a few "wild, found skulls" in the classroom, compare these to the kit skulls to determine what these mystery animals are.