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# Guess that Skull

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## Purpose:

- In this activity students will use the basic characteristics of a skull to identify a specific skull using a dichotomous key. They will do this in small groups and through a “Guess Who” game.

## Objectives:

- The student will differentiate between different skulls based on key characteristics including shape and size.
- The student will use key skull characteristics to determine the identity of mammals.

**Time Required:** 30 – 45 minutes

**Appropriate grades:** 6 – 12

**NGSS Standards:**

**MS-LS2-2:** Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

**HS-LS4-1:** Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

## Materials:

- Skulls: (provided)
  - Beaver
  - Opossum
  - Coyote
  - Mink
  - Muskrat
  - Raccoon
  - Striped Skunk
  - Mole
  - Little Brown Bat (*Myotis*)
  - Jack Rabbit
  - Bobcat
- Two labeled skull sheets (Rodent and Carnivorous Mammal)
- Dichotomous key
- Felt 1ft X1 ft squares

## Activity:

### Introduction

Introduce the idea that we will be working with skulls of different mammals and that these tools are a privilege and need to be treated with respect. Discuss what respect means and proper ways to handle skulls.

With the entire class, hold up two very different skulls (maybe the beaver and the skunk) and ask student to compare and contrast them. Generate a list of similarities and differences on the board.

Use the features listed by the students to introduce key characteristics for skulls (see diagrams).

Introduce a dichotomous key and explain how it helps scientists systematically look at characteristics to identify organisms. Key out one skull with students to



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	demonstrate how to use it.
<b>Body</b>	<p>Before handing out skulls remind students of the proper way to handle them. Break the class into 8 groups and give each group a skull. (Make sure the label on the box is covered so the identity remains a mystery for the students.) Have the groups become experts on their skull by:</p> <ul style="list-style-type: none"> <li>• Drawing a rough sketch of the skull</li> <li>• Identifying key characteristics using the rodent skull and carnivorous mammal skull diagrams</li> <li>• Using the dichotomous key to identify their skull</li> </ul> <p>Once the group has confirmed their identification with the teacher, have them hide their skull in a box and then pair up with another group and play “Guess Who”. Students will use questions of their own creation or from the dichotomous key to identify the other teams skull. Questions can be asked in order of the dichotomous key or out of order, which ever they think will be more efficient.</p>
<b>Closure</b>	<p>Come back together as a class and have groups share what skull they had. In the discussion, emphasize what features were especially helpful for identifying their skull.</p> <p>Compare and contrast the skulls and discuss why different animals might have different characteristics for their skull. See modifications for specific on discussion.</p> <p>Hand out characteristics comparison worksheet for students to color either in class or at home. Characteristics visible are cranium, nasal cavity, mandible, zygomatic arch and orbit. Auditory bullae not visible in these drawings.</p>

## Extension:

- In small groups, have students do further research into the discussion and create a poster on their findings.
- Write a fictional story or poem about life as one specific mammal, focusing on topics from the discussion.

## Modifications:

- **Elementary:**
  - Use age appropriate skull diagrams and key
  - Focus on vocabulary: canines, incisors, molars, jaw, eye socket



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- In closure, compare and contrast the skulls and talk about why animals have certain characteristics. Focus on animals diet and how that affects their eyes, nose and teeth.
- **Middle School:**
  - Use age appropriate skull diagrams and key
  - Focus on vocabulary: cranium, orbit and mandible
  - In closure, compare and contrast the skulls and discuss why certain traits are present for certain animals. Some research on the life history of their animal may be necessary. Discuss how certain characteristics of skulls help each animal fill their ecological niche.
- **High School:**
  - Use age appropriate skull diagrams and key
  - Focus on vocabulary: zygomatic arch, auditory bullae, infraorbital foramen
  - In closure, compare and contrast the skulls and create hypothesis about which animals are more closely related and what traits might have evolved before other traits (based on how common they are)

