

# Classroom Lessons to Middle School Students in Arkansas

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## Get Schooled on Skulls!

### Purpose

The purpose of this lesson is to help students link structure to function in mammalian skeletal systems. They will learn that the various characteristics of mammalian skulls can tell us a lot about the animal itself. After the lesson, students should be able to look at a skull and tell what the animal ate, what its strongest senses were, and whether it was a predator or prey.

### The Lesson

First, I laid out six different mammalian skulls for the students to look at as they entered the classroom. I then showed a PowerPoint presentation on how to use skull characteristics to identify the animal they belonged to. We discussed the five senses and how they are manifested in mammalian skulls, how to tell whether the animal was a predator or prey, and how to identify what the animal ate by looking at their teeth. After the students had this information, we worked as a class to identify the six skulls we had sitting out. The students successfully identified some of the skulls (white-tailed deer, wild hog, and black bear) and correctly identified many of the characteristics of the remaining skulls (giant anteater, dire wolf, and baboon).



### The Activity

After working together as a class to identify the skulls, I split the students up into pairs to identify skulls that belonged to various Arkansas furbearers (beavers, bobcats, gray foxes, red foxes, and coyotes). The students were given a handout summarizing the information we discussed in the PowerPoint presentation, and went to work identifying the skulls. After a pair successfully identified a skull, they traded with a different group and attempted to identify the new skull.

### Student Response

At the beginning of class, approximately half of the students were excited about working with skulls and about half refused to touch them. Throughout class, many of the students who were unwilling to participate became increasingly more interested and enthusiastic. By the activity at the end of the class period, all of the students were comfortable enough with the skulls to hold and identify them.

### Where can I get skulls?

Oftentimes you can borrow skulls from local museums, the biology department at a local school, and extension offices. Additionally, you can try contacting local resource agencies (i.e. U.S.F.S. Ranger Station) to see if they have any skulls you can borrow.

## How Well Can You Read a Map?

### Purpose

Current technology allows us to use a GPS navigation system in our cars to the point that physical maps are being used less and less. Never the less, having an understanding of how to read a map remains an important skill in many industries. The purpose of this lesson was to expose the students to a brief history of cartography, how United States Geological Survey (USGS) maps are made, and how to read them.

### The Lesson

I began the lesson by describing some basic features of topographic maps using a PowerPoint presentation including: contour lines and what they represent, different map scales and the amount of area that they represent, what streams and water-bodies looked like, and how to read elevations on a USGS topographic map. I then briefly described the Universal Transverse Mercator (UTM) grid system and how the grid system is set up on the maps. This system is much like the latitude and longitude system to describe an exact location, numerically, of any location on earth.



### The Activity

Students were asked to work in groups of 3 due to a limited number of maps. Around the room on tables I placed 5 USGS maps, some from Arkansas and some from New Mexico. The maps I used from Arkansas were from our local area in the hope that some of the students would recognize and get a better spatial and topographical understanding of the local area. The maps I used from New Mexico showed very different topography, including high elevation mountains and low elevation deserts, than those I used from Arkansas to give the students more exposure to highly variable topography. Students were given worksheets with questions to answer at each of the map stations. Questions included things like naming the number of wetlands on the map, what features on the map have volcanic origins, what town is in the northwest corner of the map, etc. I also asked the students to name a map feature at a given UTM coordinate.

### Student Response

During my brief lecture there didn't seem to be a positive response to the lesson but once we started the activity many of the students looked at it almost like a treasure hunt. Team participation was very high and I felt that the students grasped the material well. The hardest part for the students was reading and understanding the UTM grid system on the map but with a little help most students caught on quickly.

### How can you purchase USGS maps?

USGS maps can be obtained from many outdoor stores and through the USGS website at [http://store.usgs.gov/b2c\\_usgs/b2c/start/\(xcm=r3standardpitrex\\_prd\)/.do](http://store.usgs.gov/b2c_usgs/b2c/start/(xcm=r3standardpitrex_prd)/.do)

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