

Question 1

Different animal groups have different needs. The skulls of animals easily show off these differences. Search the internet and look at the skulls for Birds, Mammals, Reptiles - Turtles and Reptiles - Snakes. List some features that are unique to each group.

1. Birds – **Beak, hollow and open skull.**
2. Mammals – **Teeth, developed area around one or more of the senses, dense bone structure**
3. Reptile – Turtle - **Have beaks and no teeth, dense bone structure.**
4. Reptile - Snake - **Pointed teeth, hollow/open skull, jaw bones not connected.**

Question 2

Animals belonging to the same family group (i.e.: cats, canines, owls etc.) have similar skull shapes. Search for skull images of the groups above and other family groups that you can think of. List the species with the largest and smallest skulls for each group.

What is the family group? _____ Largest: _____ Size: _____

Smallest: _____ Size: _____

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Question 3

The importance of an animal's sense of smell is based on the development of the nasal cavity within the animal's snout. Below are pictures with rulers depicting the measurements of a coyote's snout. What are the measurements of the animal's snout?



What is the length? 2 1/4". What is the height? 5/8" What is the width? 1/2"

What is the length, height, & width of your nose? _____

How far away do you think this animal can smell and detect an odor? ~ 1/2 mile

How far away can you smell and detect an odor? _____

What can you draw from your answers? The greater the length in a nasal cavity, the more developed the animal's sense of smell.

Question 4

Placement of the eye sockets can provide some insight into an animal's behavior. Over-developed eye sockets can indicate sensitivity to light and nocturnal activities. Placement of the eye sockets towards the front of the skull versus the sides of the skulls gives an animal greater depth perception but reduces peripheral vision. Find pictures online of a bobcat skull and a deer skull. What conclusions can you make about each of these animals?

Bobcat: **Animal has night vision, strong depth perception, narrow peripheral vision, hunter**

Deer: **Animal has wide peripheral of vision, little to no depth perception, daytime animal, prey.**

How about a Human? **strong depth perception, limited peripheral vision, active during day.**

Question 5

Teeth define the lifestyle of a mammal. There are four major types of teeth:

Incisors - Small chisel like teeth, designed for cutting into its food

Canines – The signature teeth of carnivores. Primary used for the killing bite.

Typically much longer and pointed than any of the other teeth.

Premolars & Molars – These teeth are wide and designed chewing/grinding food.

Below are pictures of two skulls. Counting teeth can help you determine the skulls identity. The count of each type of teeth is known as the dental formula in the guidebooks. Examine the two skulls in the picture below, how many of each type of teeth do the skulls have and what type of animal do you think the skulls might be from?



Skull 1: **Rabbit**

Skull 2: **Raccoon**

Incisors:	<u> 6 </u>	-	<u> 6 </u>
Canines:	<u> 0 </u>	-	<u> 2 </u>
Premolars & Molars	<u> 12 </u>		<u> 12 </u>
What does it eat?	<u> vegetation </u>		<u> omnivore </u>

Pick two more animals and search online for a picture of their teeth. What is the dental formula for each of these animals?

Question 6

Deer are one of the most frequently found skull bones in Hunterdon County. Teeth can be used to estimate the age of a deer. Watch the following video on this youtube link: [youtube.com/watch?v=Aem65RBHL98](https://www.youtube.com/watch?v=Aem65RBHL98). Look at the pictures below and try to determine the age of the deer.

Jaw 1



___ Fawn – Under six months of age. Note that the fifth tooth has not even grown in. ___

Jaw 2



2 ½ or older: The Fifth tooth has a dentin line that is greater than enamel. Note the sixth tooth missing for any other conclusion.

Question 7

In the images below, notice the gap between the bones of the lower jaw and the arch on the side of the skull. Also, notice the crest at the back of the skull. It is called the Sagittal Crest. The greater the distance between the jaw and arch, and the greater the development of the crest, the more muscle mass and the greater bite force the animal has. This skull is from the most massive wild mammal in the county.



Who's is this? Bear Should one try and get close to this animal? No

However, this skull is in conflict with what you have learned. This animal is primarily a vegetarian and an insectivore. The meat it usually eats is from scavenged remains. This animal does have a superb sense of smell. How far do you think it can smell?

One mile, plus

Question 8

Think back to Question 1. Like all bones in a bird, the bird's skull must be light weight and sheds bone mass so the birds can be as light as possible for flight. Notice the openness of this skull. Bill design can give us an insight into their food and species identification. Use the features of the bill in the picture below and make an educated guess as to what type of bird this skull might be from and what prey it eats?



Great Blue Heron – Long pointed bill that probes for fish

Question 9

You were asked to look at Reptile Snake Skulls back at Question 1. If you did not look at venomous snake skulls then, do so now. Venomous snakes have two special teeth called fangs. They have the ability to replace their fangs if they break. These teeth are hollow and the venom is injected through these teeth by squeezing a gland behind them. New Jersey has two venomous snakes. What are their names?

Timber Rattlesnake & Northern Copperhead

Question 10

This animal is one of a kind in North America. Its skull is famous for the ridge on the back of the skull and large quantity of teeth. This animal has a very small brain for its size, which could explain its temperament.



What are some other observations that you can make about this skull?

___Mammal___ 10 incisors, 2 canines, 14 premolars/molars ___predator eye pattern

___strong sense of smell___ over developed muscle mass for bite force ___

What animal is this animal? ___Opossum_____

(Hint: Unlike its depiction in cartoons, it cannot hang by its tail and is often accused of playing dead.)

Question 11

Take a moment and look at some skulls one more time.

Is the skull one bone or many? ___Many___

Do you notice the lines in the skull? These are where different bones are merged together.

What are these points called? ___Fixed Joints_____

How many bones does the human skull have? ___22___