

Student Handout #1: Common Mammals of South Carolina Interactive CD

Answer the following questions about each species of mammal featured on this CD.

Virginia Opossum: *Didelphis virginiana*

1. Is the sagittal crest of the opossum large? What can be inferred from this?

Yes, the sagittal crest is quite pronounced. This crest provides ample space for temporalis muscle attachment for the jaw closing muscles. A large sagittal crest infers a stronger bite.

2. What is meant by “playing possum,” and how does the opossum use it for defense?

They display an unusual defense strategy, known as playing “possum.” When confronted by a predator, they will collapse and lie motionless for a moment. At the first opportune moment they reawaken and run off.

Eastern Mole

1. In what direction are the eye orbits facing? What can be inferred from this?

The orbits are located on the sides of the head. The position of the orbits (the hole where the eyes are) gives an indication of whether a mammal has good depth perception or a wide range of vision. Orbits located on the front of the skull indicate that the eyes are forward facing. This allows for better depth perception. In many tree dwelling primates, the orbits are on the front of the skull which is an important feature to have when you are arboreal and trying to jump from branch to branch. Good depth perception would also be helpful if you are a predator tracking your prey. Orbits located on the side of the head indicate that the eyes are located laterally. This allows for enhanced peripheral vision (vision that allows the animal to see “out of the corner of its eyes”). This is important for many mammals that need to be aware of possible danger in their surroundings, including becoming prey.

2. For what are the forelimbs of the mole adapted?

The forelimbs are modified for fossorial (underground or burrowing) lifestyle.

Short-tailed Shrew

1. Is the snout elongated? What can be inferred from this?

The short-tailed shrew has an elongated snout. Elongated snouts in mammals also have a couple of adaptive benefits. A long, wide snout can provide more room for organs related to smell. A long, narrow snout may allow the animal to reach into crevices to get its prey.

2. What unique ability does the shrew possess that allows them to subdue their prey easily?

Shrews use venomous saliva to subdue their prey.

Little Brown Bat: *Myotis lucifugus*

1. What inference can be made about the pointed cusps on the bat's premolars and molars?

If the molars and premolars have really pointed cusps, this indicates that the animal may specialize in eating insects (**insectivore**) or is perhaps a primitive mammal.

2. What are some health hazards that bats pose to people?

Little brown bats carry fleas, ticks, mites, roundworms, tapeworms, and flukes. Bats are possible vectors of rabies, but this particular species has not been identified to be a significant threat. However, you should never attempt to handle a wild bat; call a pest control company if you have bats in your attic or garage.

Humans can also contract a disease called histoplasmosis by inhaling spores found around bat dwellings. Histoplasmosis is a disease caused by a fungus found in bat and bird droppings. It typically affects the lungs. It can be very serious, and you should tell your doctor if you have come into contact with bat droppings and if you experience the following symptoms: coughing, fever, and achiness. Infection can be acute (short term) or chronic (long term). Histoplasmosis can be easily treated with antifungal medications.

Eastern Cottontail

1. What is the bony webbing on the cottontail's skull called? What can be inferred from this?

The cottontail skull is filled with holes; it looks like a bony web which is called **amplified fenestration**. This makes the skull lighter, so the rabbit can hop more easily and move quicker. Rabbits and hares (members of the Order Lagomorpha) have this bony webbing.

2. Why is the cottontail called a cottontail?

Its tail is brown on top and white on the bottom. The bottom part of the tail is most often seen, hence the name "cottontail".

Eastern Gray Squirrel: *Sciurus carolinensis*

1. Is the jaw joint in line with the teeth of the lower jaw? What can be inferred from this?

The jaw joint is higher than the height of the teeth on the lower jaw. When this occurs the teeth will come together at the same time when the animal chews. This indicates that the animal may be an herbivore.

2. Describe the gray squirrel's optimal habitat.

They prefer dense hardwood or mixed forests. They are most often found among beech and oak dominated forests, and are very common in urban settings.

Beaver: *Castor canadensis*

1. What adaptation of the beaver helps it to nip or cut plants underwater?

They can wrap their lips around their incisors.

2. What is the beaver's conservation history and what is its present status?

When European settlers first came to North America, the beaver was very common; however, it was soon hunted to near extinction because its pelt (its skin and fur) were so valuable. In recent times, conservation efforts have increased beaver populations so much that they are once again being harvested for fur.

Deer Mouse: *Peromyscus maniculatus*

1. What do the deer mouse's large incisors allow it to do?

Like other rodents, the deer mouse has large, ever-growing, chisel-like incisors which help it to grasp and cut plant material.

2. Why is it important to control deer mouse numbers in populated areas?

Rodents such as the deer mouse can carry a deadly disease called Hantavirus, which causes Hantavirus pulmonary syndrome (HPS) in humans. The disease is contracted through contact (touch and inhalation) with infected urine, fecal material, and saliva; however, it cannot be transmitted from person to person. Symptoms include: fatigue, fever, dizziness, and achiness in the large muscle groups. More advanced symptoms (these usually occur 4-10 days after contraction) include: coughing, shortness of breath, and fluid in the lungs. Symptoms may become apparent as soon as one week and as late as five weeks after exposure. In order to prevent Hantavirus exposure, it is important to keep rodents away. This can be done by keeping holes in walls sealed, sealing food storage areas, and cleaning out barns or garages. Although Hantavirus is rare in the United States, it can be deadly and should be taken seriously.

Muskrat: *Ondatra zibethicus*

1. What is unique about the cheek teeth of the muskrat?

They have a special pattern grinding surface that can distinguish them from other rodents.

2. What is tularemia?

Musk rats have also been known to be vectors of tularemia, a highly infectious bacterial disease. Tularemia is spread by several ways; it can be contracted from a bite of an exposed tick, by handling an infected carcass, by drinking contaminated water, or it can be airborne. The airborne form has been studied by the government for potential use as a biological weapon. Symptoms include: ulcers on the mouth or nose, respiratory complications, fever, chills, achiness, headache, diarrhea, and weakness.

Bobcat: *Lynx rufus*

1. What does the bobcat's diet mainly consist of?

The bobcat is a strict carnivore with rabbits, rodents, other small mammals, and birds making up the majority of its food; however, it has been known to take larger prey such as deer. It may also eat carrion when encountered.

2. In what direction are the eye orbits facing? What can be inferred from this?

The orbits are located at the front of the head. The position of the orbits (the hole where the eyes are) gives an indication of whether a mammal has good depth perception or a wide range of vision. Orbits located on the front of the skull indicate that the eyes are forward facing. This allows for better depth perception. In many tree dwelling primates, the orbits are on the front of the skull which is an important feature to have when you are arboreal and trying to jump from branch to branch. Good depth perception would also be helpful if you are a predator tracking your prey. Orbits located on the side of the head indicate that the eyes are located laterally. This allows for enhanced peripheral vision (vision that allows the animal to see "out of the corner of its eyes"). This is important for many mammals that need to be aware of possible danger in their surroundings, including becoming prey.

Gray Fox: *Urocyon cinereoargenteus*

1. Why would a gray fox prefer a forested habitat?

Unlike other North American dogs, the Gray Fox can climb trees to escape predators or find food.

2. How can the gray fox be distinguished from the red fox using only its skull for identification?

The gray fox has a "U" shaped temporal ridge, while the red fox has a "V" shaped temporal ridge.

Raccoon: *Procyon lotor*

1. How long is the raccoon gestation (pregnancy) period?

Most raccoon mating takes place in February, but can continue into the spring if mating is unsuccessful or the first litter is lost. An annual litter of three to four (but up to seven) is born about two months later.

2. What is carnassial dentition and how does the raccoon use it?

Some animals that have canines may also have their last upper premolar and the first lower molar quite sharp and prominent. When these teeth come together as the jaw closes, they are able to cut flesh effectively, like a pair of scissors. This is called **carnassial dentition** and indicates that they are a carnivore (in fact, those with carnassial dentition are found in the order Carnivora). Raccoons have carnassial dentition to help them cut or shear meat.

Mink: *Mustela vison*

1. Is the jaw joint in line with the teeth of the lower jaw? What can be inferred from this?

The jaw joint is in line with the height of the teeth on the lower jaw. This means the teeth will come together back to front, like a pair of scissors, with the molars meeting first and the incisors meeting last, when the animal chews which allows the teeth to cut and shear meat. This indicates that the animal may be a carnivore or omnivore.

2. What health hazards do mink pose to humans?

In domestic populations, anthrax, distemper, and encephalitis are found. Anthrax is a bacterial disease that can be spread to humans, and may be used as a biological weapon because it is so infectious.

Striped Skunk: *Mephitis mephitis*

1. Do the teeth indicate that this animal is a carnivore, herbivore, omnivore, or insectivore? Explain your answer.

Some animals that have canines may also have premolars that are an intermediate between canines with some cusps for cutting, yet still has a somewhat flat surface for grinding like the molar which indicates that this animal may be more of an omnivore than a carnivore. If, however, the molars and premolars are not flat for grinding plants, but have really pointed cusps, this indicates that the animal may specialize in eating insects (**insectivore**) or is perhaps a primitive mammal. The skunk has canines which mean it is either a carnivore or omnivore, but not an herbivore. The premolars are an intermediate between canines with some cusps for cutting, yet still have a somewhat flat surface for grinding like the molar which indicates that this animal may be more of an omnivore than a carnivore and not an insectivore.

2. How does a skunk spray their noxious chemical?

When threatened, striped skunks use their anal scent glands to spray a noxious chemical at their attacker. They do so by standing on their front paws and lifting their tails. A skunk can spray accurately from as far as 4.5m (15 ft) away. There are two internal glands, found on both sides of the anus. Each gland has a duct connecting it to a nipple on the exterior of the anus. When agitated, the tail is raised and the muscular walls of the anus are relaxed. This exposes the nipples and allows the skunk to direct the spray.