635-4910 (74-300) Owl Pellet Kit

Your Kit Should Include:

- Pellets: 15, 30, or 60.
- Probes: two per pellet.
- Instruction Manual

Note: for safety, each pellet has been washed in an antimicrobial bath and then heat sterilized. This cleans the pellet and eliminates germs. Even so, it is recommended that students wash their hands after the lab and avoid ingesting any part of the pellets.

Warranty and Parts:
We replace all defective or missing parts free of charge. Additional replacement parts may be ordered toll-free. We accept MasterCard, Visa, checks and School P.O.s. All products warranted to be free from defect for 90 days. Does not apply to accident, misuse or normal wear and tear. Intended for children 13 years of age and up. This item is not a toy. It may contain small parts that can be choking hazards. Adult supervision is required.

Introduction: What exactly are owl pellets?

The answer to this question first requires an explanation of what an owl is. Everyone knows that owls are birds, but not everyone knows how unique they are. Owls are *raptors*: a group of predatory birds that includes hawks and eagles. However, they have evolved certain unique characteristics to help them hunt. Nearly all owls are nocturnal, meaning they are active at night. Almost all other birds of prey, including vultures, are *diurnal*, meaning they are active during the day. Common features among raptors are: excellent vision, powerful beaks, and sharp talons.

In order to hunt effectively in darkness, owls need superior senses. Their huge eyes are fixed in their sockets, meaning the whole head must be turned to change the owl's view. This is partly due to the

size of the eyes, but mostly due to the fact that the eyes are tubular, rather than spherical. While this seems cumbersome, it allows for very large eyes, which help provide excellent night vision. Most owls can rotate their heads over 270° to accommodate this lack of motion. Owls also have highly developed visual centers in their brains, which can make meaningful images out of scattered bits of data. With binocular vision thrown into the mix, owls have some of the most powerful night vision of any creature.

In addition, owls have incredible hearing. It is said an owl can hear the noise a worm makes as it burrows. This means that an owl can hunt effectively in total darkness or if it is blind. Asymmetrically positioned ears make it easier to pinpoint the exact location of prey. Unlike bats, owls do not have a system of echolocation.

Owls have also evolved to blend in with the night. Their feathers are often drab, which helps camouflage them. They also have a layer of very fine feathers on the leading edges of their wings. This breaks up turbulence. While it reduces overall lift, it allows the owl to fly almost silently. Curiously, an owl can hear itself fly, but very few mammals can. Due to these adaptations an owl can strike before the prey even knows it is there. Sharp talons and a powerful beak ensure a quick kill.

For the purposes of this kit we will discuss barn owls.

Barn owls are so named because they are often found in barns. Unlike most birds, they do not make nests. Instead, they search for cavities and lay their eggs directly inside. Anywhere cool and dark can make a suitable rearing place. They have been found in the hollows of trees, in caves, and even in old oil drums. Barns are a good place for them because they combine hiding places with a supply of rodents to eat. Many farmers do not mind having the owls in their barns; they are very useful for rodent control. Barn owls are found throughout most of the world, except Greenland, Antarctica, the far north, central Asia, and some remote deserts. They are one of the most widely distributed birds and in little danger of extinction.

Barn owls are relatively small for a bird of prey: the largest among them might weigh a pound and a half and have a wingspan of three feet. Females are usually larger, as is common with raptors. They are pale colored, which helps them blend in with moonlit surroundings. They are easily distinguished from other birds by their heart shaped faces. On some occasions, it is reported that barn owls can have bioluminescent fungus growing in their feathers. This, combined with silent flight and an otherworldly screech, may form the basis of some ghost sightings.

Unusually for a large carnivore, barn owls do not live very long, usually only 1-2 years. Some individuals in captivity have lived over 20 years, suggesting lifespan is limited by predation and injury rather than some innate mechanism. They also produce a large number of chicks, as many as 27, although most clutches are in the 7 to 12 range. Even so, that is a lot of baby birds. They grow rapidly and require a large amount of food to sustain them. The parent owls must be successful hunters in order to provide for the young. They are highly adapted for feeding on small rodents, and these are their primary food source. A family of barn owls can consume over 3,000 rodents in a single breeding season! Barn owls also eat smaller birds, reptiles, and even invertebrates if they are desperate. They seldom attack pets or domestic animals. Often, these animals are simply too big for them. As a smaller bird, the barn owl prefers to strike quickly with precision, rather than brute force. Barn owls themselves fall prey to larger birds, such as hawks or the Great Horned Owl. Barn owls will live near open country where rodents can be easily found, and avoid dense woodlands, where their predators live.

Bringing us back to the original question: what is an owl pellet?

Owl pellets are a byproduct of digestion. Like all birds, owls do not have teeth. This means that they cannot chew their food and must swallow it whole. The owls will eat the meat and organs of a prey animal. However, certain animal parts, like beaks, hair, and bones, cannot be digested. To get around this, owls have a specialized structure called a *crop*. This is an outpocketing of the esophagus. They will store the indigestible parts here. When it is full, they regurgitate the contents. This is what forms the pellet; it is a mass of bones surrounded by hair. Dissecting these pellets indicates what the owl ate and forms the basis of our kit.

Operation: To dissect your owl pellet, you will need the following:

- ☐ Pellet. Included. These can be given to each student, or to groups of two or three.
- ☐ Wooden probes. Included. Each pellet will require two probes. This allows the student to dissect the pellet without having to touch it.
- ☐ Bone Charts. These help the student match up what they have found with different parts of an animal. Examples can be found at the back of this booklet. We recommend photocopying these charts so that each group can have its own. The chart is of common prey animals.

Recommended, but not included:

- ☐ Rubber gloves. This gets rid of some of the 'yuck' factor.
- ☐ Tweezers, to help separate the pellet.
- ☐ Display mounts to showcase the findings.

To properly dissect the pellet, please follow the steps below:

- ☐ Place the pellet on a piece of foil or scrap paper. This makes clean up easier.
- ☐ Using your probes, carefully split the pellet down the center and pull it apart.
- ☐ When you have located a bone, remove the hair from it. The hair can be saved for analysis or discarded.
- ☐ Carefully clean the bone and set it aside. Later, you will compare it against the bone charts to determine what part it is.
- ☐ Repeat the above steps until all the bones have been removed and cleaned.

Some important bones to look for are:

- ☐ The skull or head.
- ☐ Mandible, or jaw bone.
- ☐ Humerus: the long arm bone.
- ☐ Radius and Ulna: the shorter arm bones, fused together
- ☐ Femur: the long leg bone. It will be longer than the humerus.
- ☐ Tibia and Fibula: the short leg bones, fused together. These are longer than the Ulna and Radius.
- ☐ Vertebrae
- ☐ Ribs
- ☐ Pelvis or hip bone.
- ☐ Tail bones: these are extensions of the spine.

- ☐ Beaks, for birds.
- ☐ Wishbone: a horseshoe shaped bone found in birds. The wing muscles connect to this.
- ☐ Phalanges: 'finger' bones.
- ☐ Carpals and Tarsus: wrist and ankle bones, respectively.
- ☐ Clavicle: collar bone.
- ☐ Scapula: shoulder bone.

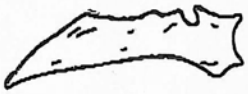
It is not at all uncommon to find bones from several creatures in your pellet. You may find a bird's skull, the jaw of a rat, and the ribs of a mole inside one pellet. Owls are opportunistic feeders, meaning they do not pass up the chance for an easy meal. This can often lead to quite a jumble inside each owl, as several different meals are mixed together!

Scientists sometimes use owl pellets to gauge the ecological health of an area. For example, if small lizards were common in an area ten years ago but none can be found in owl pellets, it may indicate a decline in lizard populations. Likewise, a sudden surge in mouse remains might mean that mouse populations are exploding. Of course, keeping track of the sheer number of pellets collected can indicate how many owls live in an area. Normally a family of owls will require 20 or 30 acres to sustain themselves. In areas where food is scarce, this range will increase. In some areas, such as farmland where rats are plentiful, the owls may cluster more closely together. Owls do not defend their hunting ranges but will attack any owl that comes near their young.

Skull

Wishbone

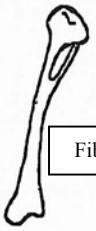
Mandible



Femur

Radius and Ulna

Scapula

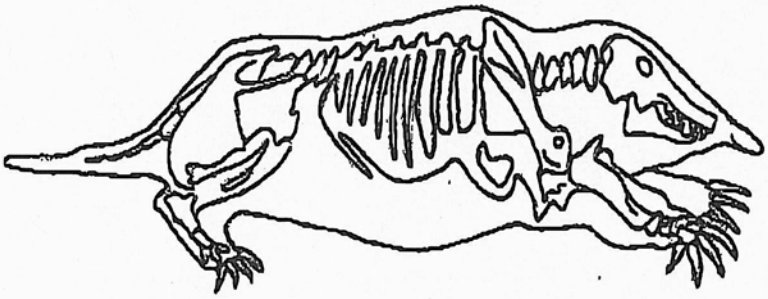


Fibula and Tibia

Humerus

Pelvis

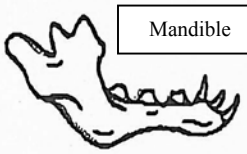
Bird Skeleton
Place bones here for analysis:



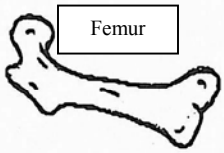
Skull

Clavicle

Mandible



Femur



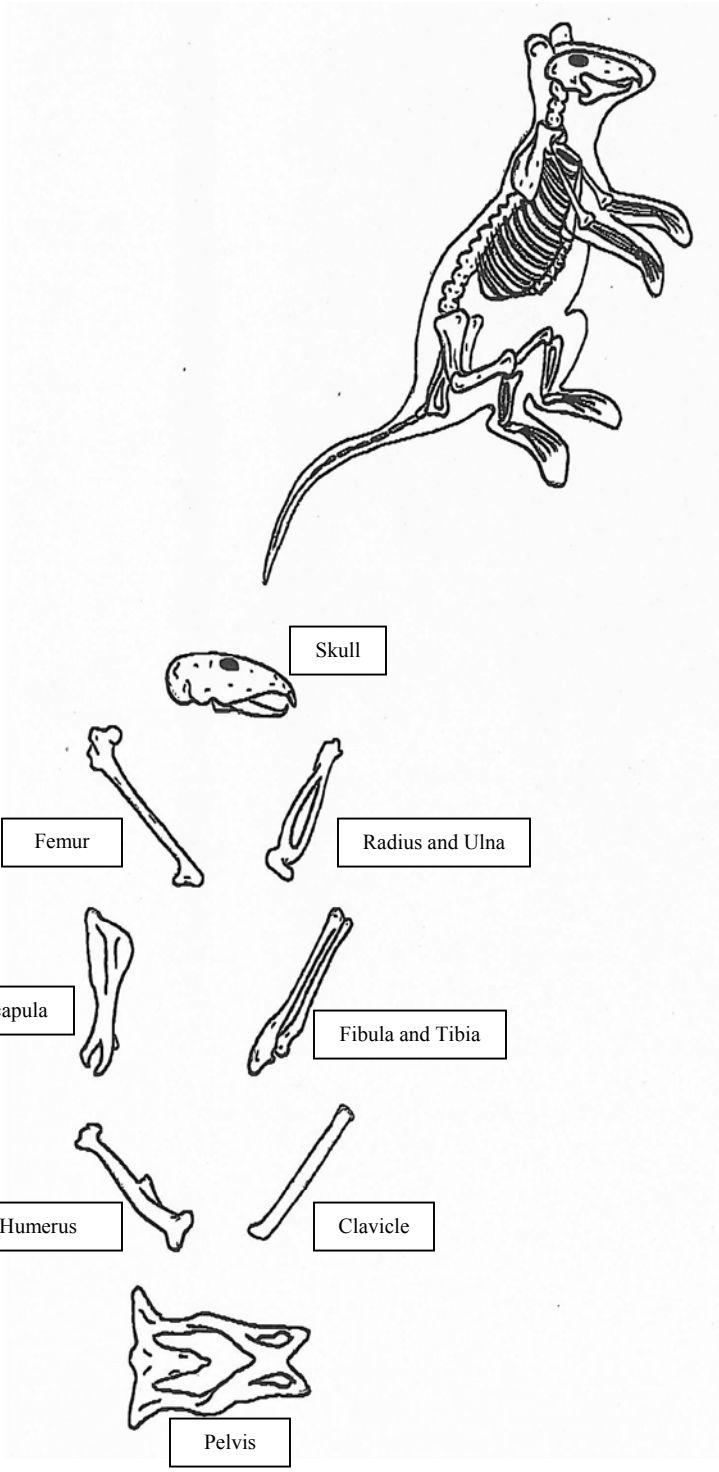
Humerus

Fibula and Tibia

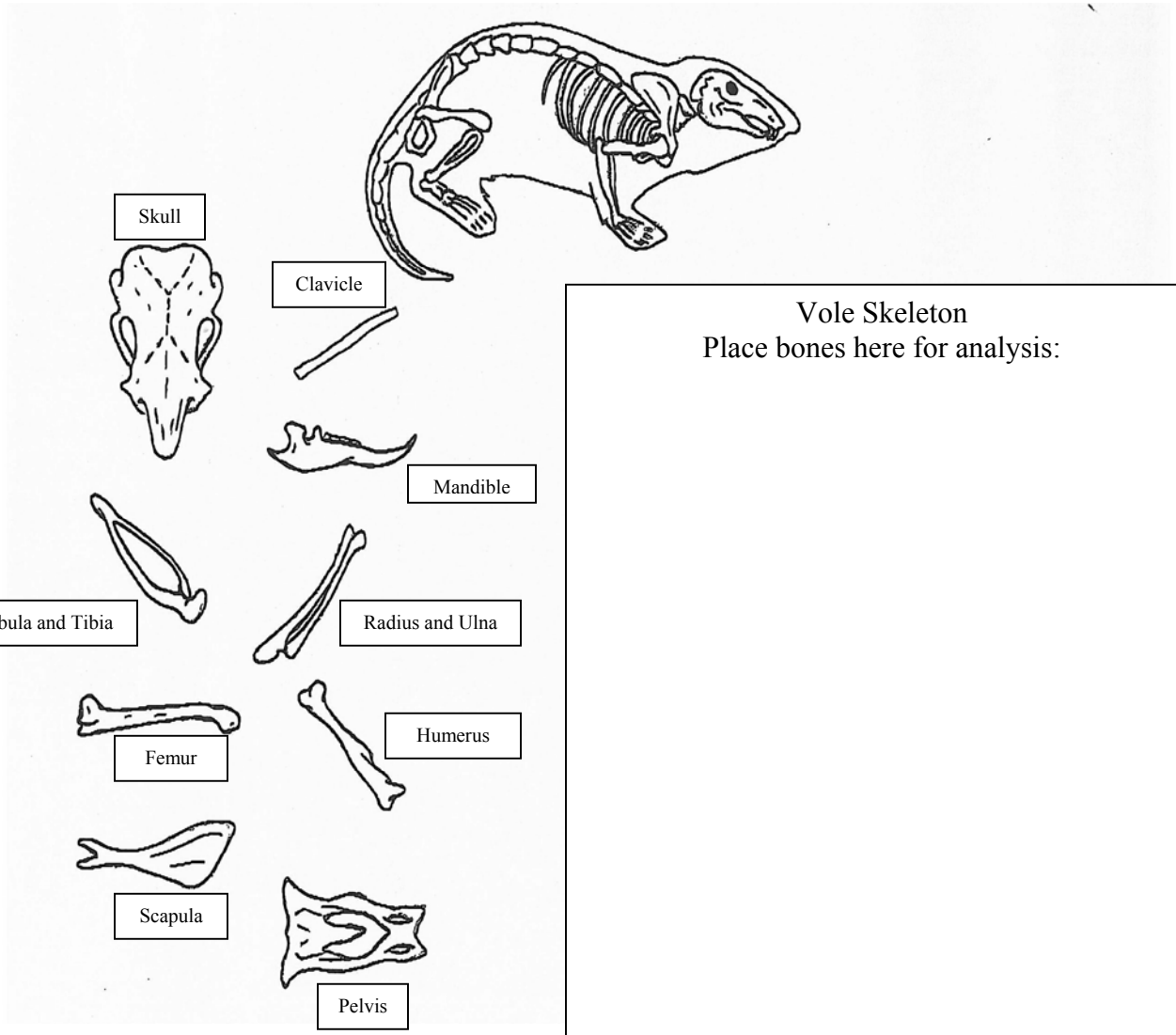
Scapula

Pelvis

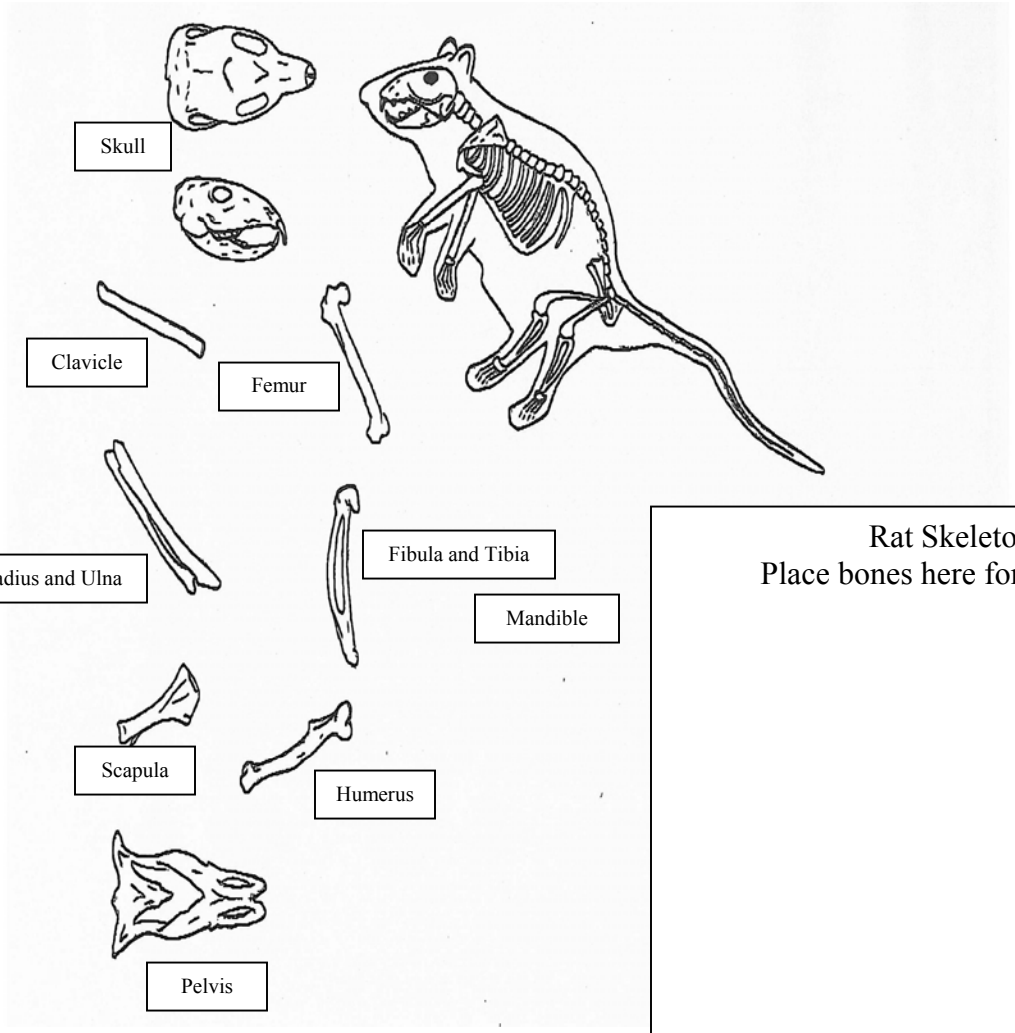
Mole Skeleton
Place bones here for analysis:



Mouse Skeleton
Place bones here for analysis:



Vole Skeleton
Place bones here for analysis:



Rat Skeleton
Place bones here for analysis:

Food Webs:

Food webs, also called food chains, are diagrams that show how different animals become prey and predator. They are useful for determining the relationships that different organisms have toward one another. All food chains are ultimately dependent on the sun. Below is a list of the different parts of the food chain:

- ☐ Sun: this provides the energy for all life on Earth.
- ☐ Producers: these are photosynthetic organisms, such as plankton or plants. They convert sunlight into sugars.
- ☐ Primary consumers: grazing animals, such as gazelle or deer.
- ☐ Secondary consumers: animals that prey on grazing animals, such as tuna.
- ☐ Tertiary consumers: these animals prey on other predators.
- ☐ Food webs have quite a bit of overlap and are often extremely complicated and constantly changing. They can be as many as six or as few as two stages long.

Below is a flow chart indicating a common food web for barn owls: