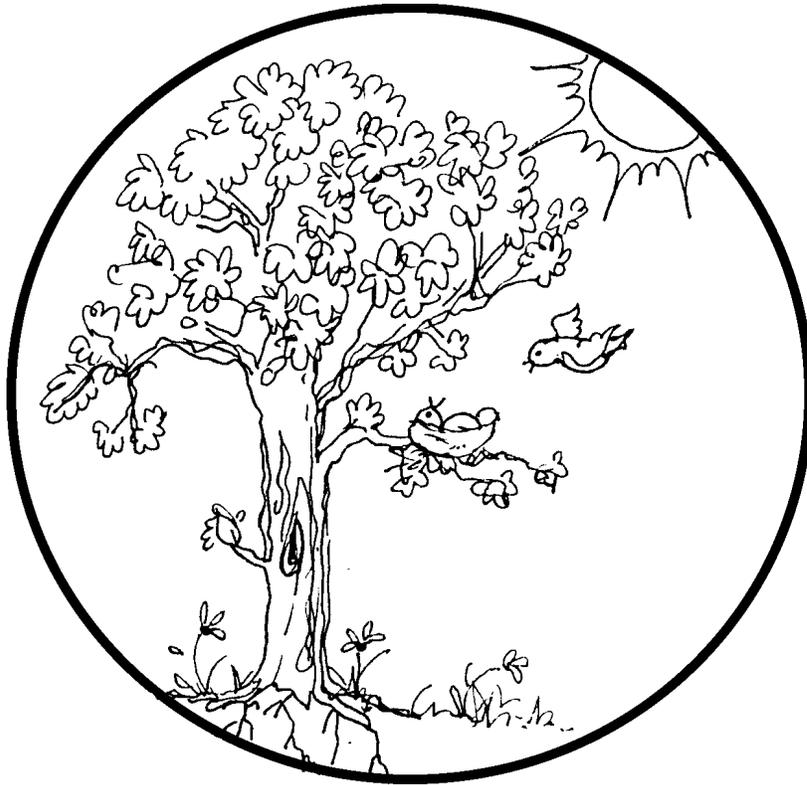


Life Cycle
Diversity in a Balance

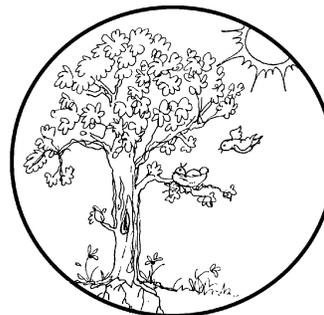


SECOND GRADE
NATURAL ENVIRONMENT



2 WEEKS
LESSON PLANS AND
ACTIVITIES

LIFE CYCLE OVERVIEW OF SECOND GRADE



ORGANISMS

WEEK 1.

PRE: *Distinguishing characteristics of vertebrates.*

LAB: *Discovering characteristics of animals.*

POST: *Identifying animals by the tracks they make.*

WEEK 2.

PRE: *Developing and understanding animal jokes.*

LAB: *Describing local habitats.*

POST: *Comparing land and water organisms.*

HUMAN BIOLOGY

WEEK 3.

PRE: *Charting the growth of humans.*

LAB: *Comparing the growth of hair.*

POST: *Analyzing how babies grow.*

WEEK 4.

PRE: *Investigating growth in humans.*

LAB: *Comparing the positions of human organs with those of other animals.*

POST: *Analyzing fingerprints.*

PLANT LIFE

WEEK 5.

PRE: *Exploring the different types of leaves and roots.*

LAB: *Comparing and contrasting leaves.*

POST: *Exploring the parts of trees and flowers.*

WEEK 6.

PRE: *Discovering the diversity of plants.*

LAB: *Classifying broad and needle leaf trees.*

POST: *Discovering the importance of trees.*

NATURAL ENVIRONMENT

WEEK 7.

PRE: *Exploring different eating strategies.*

LAB: *Observing a worm family.*

POST: *Comparing the components of the nutrient cycle.*

WEEK 8.

PRE: *Investigating the life of owls.*

LAB: *Exploring owl pellets.*

POST: *Exploring your local natural environment.*

LIFE CYCLE - NATURAL ENVIRONMENT (2A)

PRE LAB

OBJECTIVES:

1. Comparing a food chain with a food web.
2. Exploring different eating strategies.

VOCABULARY:

carnivore
consumer
decomposer
food chain
food web
herbivore
omnivore
producer

Students use a worksheet to distinguish carnivores, herbivores, and omnivores.



MATERIALS:

worksheet

BACKGROUND:

The environment is full of different animals with different needs. Students should learn early how these organisms are grouped. Every organism needs to find food, which is the basis of the food chain and food web.

There are many different food chains in a specific area. Other organisms are just like humans in that most vary their diets. If an organism relies solely on one organism for food, the first organism will be in trouble if the second dies out. Individual organisms, however, do prefer specific food, but they usually vary their diets depending on what is available. The food chain refers to "who eats whom" relationship. For instance, humans eat hamburger which comes from the meat of a cow, which eats only grass (herbivore). But humans don't only eat meat, they eat many other items that come from both animals and plants (omnivore). If you plotted the entire food habits of an organism this would be called a food web.

PROCEDURE:

1. There are many ways to refer to the components of a food web. If you wish to determine the place that an organism has in a food chain you would do a breakdown that

is similar to the one shown under "Position in Food Chain."

POSITION IN FOOD CHAIN		
PRODUCER	CONSUMER	DECOMPOSE/REDUCE
* green plants	* predatory	* bacteria
		* worms

2. If you are interested in how an organism produces energy and not what they eat, you would use the words listed in "what they eat."

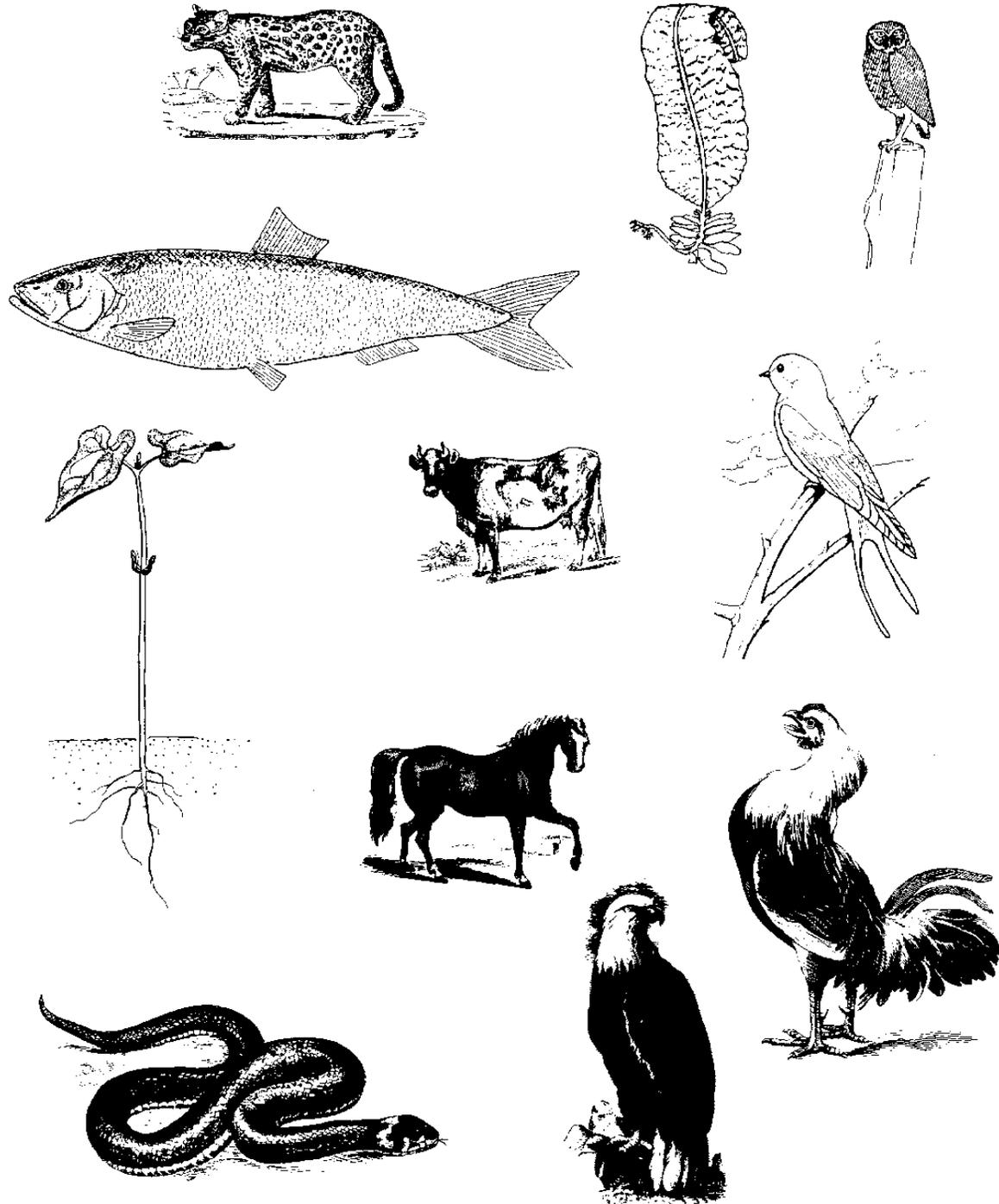
WHAT THEY EAT		
HERBIVORE	CARNIVORE	OMNIVORE
nectar eating	insectivore	scavenger
seed eating	fish eating	filter feeders
frugivore (fruit)	meat eating	detritus feeders
algae eaters		

3. Use the enclosed pictures of different animals and have students make a list of the organism and determine what they eat and where they are in the food chain.

- Large cat - consumer, carnivore
- Fern - producer
- Owl - consumer, carnivore
- Fish - consumer, omnivore
- Plant - producer
- Cow - consumer, herbivore
- Bird - consumer, omnivore
- Horse - consumer, herbivore
- Rooster - consumer, omnivore
- Eagle - consumer, carnivore
- Snake - consumer, carnivore

LIFE CYCLE - NATURAL ENVIRONMENT (2A)

PRE



LIFE CYCLE - NATURAL ENVIRONMENT (2A)

LAB

Students observe worms.

OBJECTIVES

1. Exploring decomposers in the natural environment.
2. Observing a worm "family".

VOCABULARY

decomposer
leaf litter

MATERIALS

dead leaves
worms
a large glass jar
gardening tools (or spoons), containers, sand, soil



BACKGROUND:

Worms play an important role in keeping the soil in good condition. They eat microbes on the leaf litter and pull down leaves into the soil as they tunnel. Their leftovers help enrich the soil and make conditions better for plants.

Worm tunnels also help to get air down to the plants' roots. Plant roots stretch down through the soil where they can absorb the air, water, and nutrients needed for growth. Bacteria and algae also inhabit the soil. They, along with fungi, earthworms and other soil creatures play an important role in the decomposition of organic material. Decomposers help break down dead plants and animal tissue. Nutrients are returned to the soil, where they become available to plants.

PROCEDURE:

1. Prior to lab, ask children to bring in worms, or ask for a volunteer to get worms. Stores that sell bait may have live worms. Some children seem to be better at worm catching than others.

2. Students should work in pairs, unless each child brings in his own supplies. Fill the jar with alternating layers of soil and sand so the worms will easily wiggle through. Make each layer about 1 inch deep and spray each one with water so the worms will easily wiggle through. Gently put the worms into the jar, keeping them away from bright light. The larger the jar the more worms it can sustain (e.g., a mayonnaise-type jar can hold

about 5 or 6 worms.)

3. Cover the top layer of soil with dead leaves and then cover the whole jar with a dark cloth or put it in a dark place because the worms have to think they are underground. Make sure that students do not seal the jars tight since the worms need air to survive.

4. After 3-5 days, have students look at the worm farm and answer the questions on the lab sheet. Have them write down what they observe. The worms will have tunneled through the soil and sand, so that the different layers have begun to mix together. They have also dragged the leaves down into the soil with them. Return the worms to the soil, they will die if left in the jar.

LIFE CYCLE - NATURAL ENVIRONMENT (2A)

PROBLEM: Are worms helpful to soil?

PREDICTION: _____

MATERIALS: dead leaves, worms, a large glass jar, gardening tools (or spoons), containers, sand, soil

PROCEDURE: Fill the jar with alternating layers of soil and sand. Make each layer about 1 inch deep and spray each one with water so the worms can easily wiggle through. Gently put the worms into the jar, keeping them away from bright light.

Cover the top layer of soil with dead leaves. Then cover the whole jar with a dark cloth or put it in a dark place because the worms have to think they are underground. Return the worms to the soil when finished with the lab.

DRAW WHAT THE JAR LOOKS LIKE ON THE DAYS YOU OBSERVE IT.

START	DAY _____	DAY _____

First observation:

1. Where were the leaves on the first day you looked?

2. Describe the jar. _____

Second observation:

1. Where are the leaves on the second day you looked?

2. Describe the jar. _____

CONCLUSIONS: Why are worms helpful to soil?

LIFE CYCLE - NATURAL ENVIRONMENT (2A)

POST LAB

Students use a worksheet to trace a nutrient cycle.

OBJECTIVES:

1. Investigating the nutrient cycle of a forest.
2. Comparing the components of the nutrient cycle.

VOCABULARY:

decomposers
nutrient
organic matter

MATERIALS:

worksheet
crayons



BACKGROUND:

Soil is composed of organic matter and broken down rocks. The organic matter is from other surrounding life that has started to mix with the small rocks. Many soil dwelling organisms spend their lives breaking down dead animals and plants, releasing nutrients for use by growing plants. These decomposers, sometimes called reducers, are responsible for the fertility of the soil.

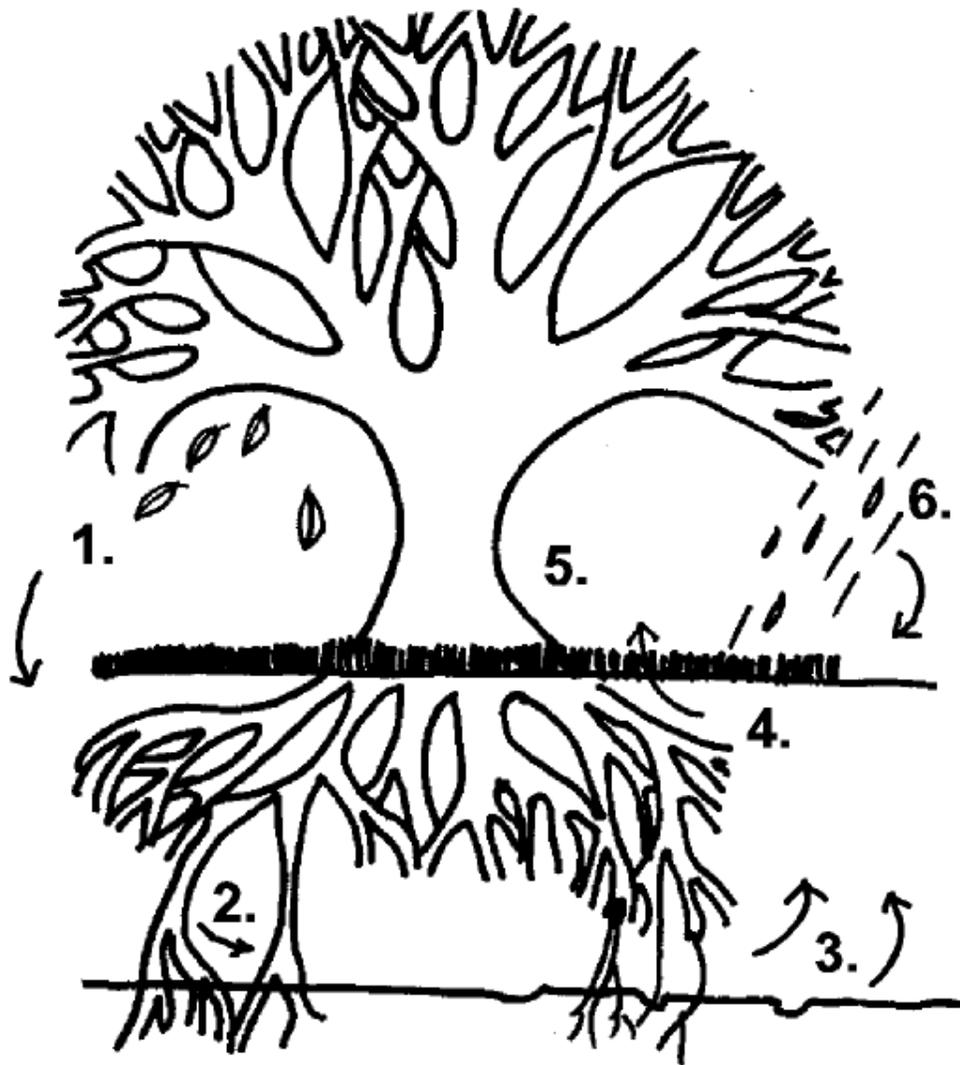
Erosion caused by water, wind, and heat can break the rocks down. Even living things such as lichens and plant roots contribute to the breaking down of rocks. Rocks are made of minerals, and minerals have many helpful elements in them that can be chemically released. This process, together with the decomposition of organic matter, eventually leads to the creation of new soil. However, this can take a very long time, one inch of topsoil may take five hundred years to form.

PROCEDURE:

1. The worksheet tries to put all the information together, so students can see how it is all related. See if the students can figure out what is going on and have them state what they think is going on in the picture.

2. (1) Dead leaves and other plant and animal matter. (2) Decomposers break down organic matter. (3) Rocks broken down. (4) Minerals and other nutrients released into soil. (5) Plant grows. (6) Water and air penetrate soil.

LIFE CYCLE - NATURAL ENVIRONMENT (2A) POST



Write down the steps of the Nutrient Cycle.

1.	4.
2.	5.
3.	6.

LIFE CYCLE - NATURAL ENVIRONMENT (2B)

PRE LAB

Students use a worksheet to compare different owls.

OBJECTIVES:

1. Investigating the life of owls.
2. Comparing environments of different owls.

VOCABULARY:

nocturnal
predatory
raptor

MATERIALS:

worksheet
crayons

BACKGROUND:

The word "owl" is the common name for nocturnal birds of prey (raptors). Owls are usually associated with the occult and the strange. They became symbolic of intelligence because it was thought they predicted events. The barn owl in Europe was looked upon as a bird of ill omens and a symbol of darkness.

Owls unlike other birds of prey, have virtually noiseless flight. They range in size from five inches (North American elf owl) to more than 2 feet. On each side of the beak there are several rows of small curved, stiff-shafted feathers, which form a ruff to support the features around their eyes. Some species have hornlike tufts near their ears.

Owls have very large eyes which maximize light gathering in conditions of minimum light, thereby enabling them to see at night. The orbs are directed forward, giving owls binocular vision, thus they are able to see their prey in a three-dimensional manner. However, an owl's eye cannot rotate, so owls have to move their entire head to continue looking at an object that is moving.

A few tropical African and Asian owls are fish eaters but most of these birds feed on small mammals and birds which they kill with their feet. They usually tear the larger prey to pieces, then swallow the parts, including fur, feathers and bones. Smaller prey is often gulped down completely. About 12 hours after eating and the prey has been digested, the bones, fur, and feathers are coughed up in small pellets. Examination of these owl pellets has produced knowledge as to the feeding habits of the different species of owls. These studies have shown that owls are very beneficial to the agriculture of their area, for while they consume large numbers of rodents they destroy few beneficial insects or birds.



PROCEDURE:

1. Students will explore the food chain of an owl lab. Different species of owls have different food chains. The worksheet has students looking at Pel's Fishing Owls, Elf Owls, Spectacle Owls, and Scops Owls. Instruct students to color them after you have gone over the information given below.
2. You are given information to discuss with students below. See if they can interpret what type of prey each owl eats after you discuss each of the owls.

PEL'S FISHING OWL

Fishing owls are found in Asia and Africa. Like other owls, the Asian owls have ear-like tufts of feathers on their heads, but the African fishing owls do not. All fishing owls have extra long powerful toes armed with strong claws, the undersides of their toes have pointed, spiky scales. As they catch fish by flying low over the water and seizing the prey with their feet, these scales give even a slippery fish little chance of escape. The Pel's fishing owl is the most common African fishing owl, and lives near wide rivers. It hunts at night, when its huge-fronted eyes let in light and they are able to see clearly even by starlight. They have loud, resonant calls which consist of either repeated short hoots, or a much longer, deep booming call. By day, they usually roost in the trees. In the early evening, they often sit on rocky crags, watching the river below for fish.

ELF OWL

The Elf owl is also called Whitney's owl after its discoverer. It has a round head with no ear tuft, a chunky body and short tail. This particular species of owl is found only in the dry parts of the southwest United States and in Mexico, where it is also known as the cactus owl. Elf owls frequently make their nests in the trunks of candelabra cactus trees.

The elf owl is more thoroughly nocturnal than most other species of small owls, usually spending the entire day in hiding. It is primarily an insect-feeder, consisting largely on night flying moths and locusts, skillfully caught while the insects are on its wing. It also catches the odd lizard. Its hooting is very loud for a bird of its size and can be heard a long way off.

SPECTACLED OWL

Spectacled owls live in the densely warm, damp tropical rain forests of South America. Here the trees have long trunks devoid of leaves, and all the leaves are at the top of the tree, forming a thick green canopy which stops the sunlight from reaching the forest floor.

This owl feeds on small mammals, such as baby squirrel monkeys, marmosets, squirrels, and mice and on insects such as dragonflies, butterflies, and moths. Although

most owls are nocturnal, the Spectacled owl will hunt in the dim light under the canopy during the day.

SCOPS OWL

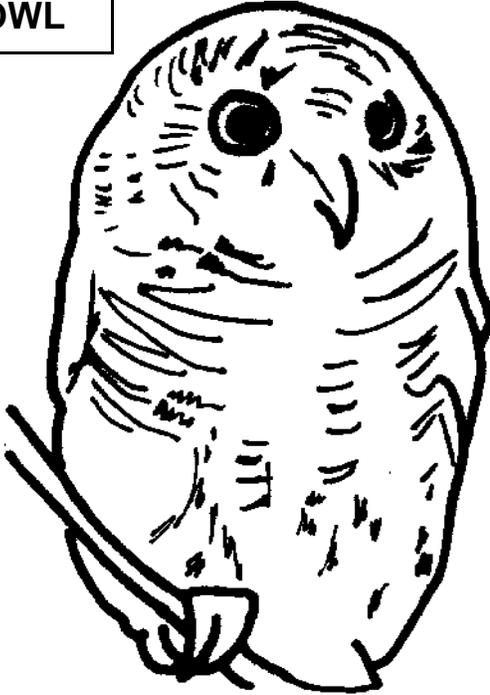
A Scops owl or Screech owl is rather a mysterious bird that has a long slim body and speckled plumage which can trick the observer into thinking it is just a withered tree stump. This small owl is migratory. In the Mediterranean part of its range it has a liking for orchards, olive groves in particular. In mountain areas it occurs up to 4,000 feet but not beyond because it is too chilly. The monotonous song, a series of hoots emitted at brief intervals, is performed by the male.

Like most owls the Scops rest during the day and starts hunting at dusk. It is primarily a hunter of insects, especially big insects such as hawkmoths, and streaks through the air in pursuit of them. It is sometimes seen perched near street lighting, waiting for insects. It supplements this diet with rodents and small birds.

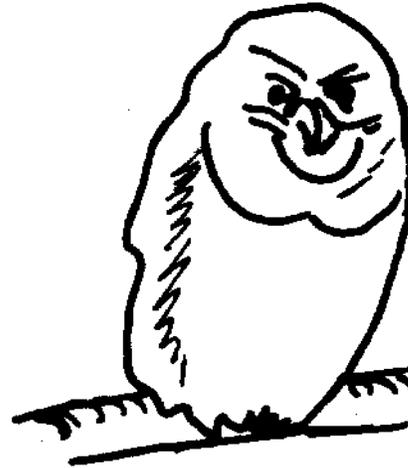
LIFE CYCLE - NATURAL ENVIRONMENT (2B)

PRE

ELF OWL



SPECTACLED OWL



PEL'S FISHING OWL



SCOPS OWL



LIFE CYCLE - NATURAL ENVIRONMENT (2B)

LAB

Students dissect an owl pellet.

OBJECTIVES:

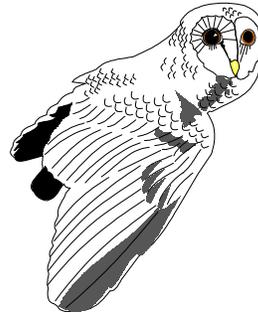
1. Exploring owl pellets.
2. Determining the eating habits of a great horned owl.

VOCABULARY:

pellet
prey

MATERIALS:

Life Cycle - Natural Environment (2B)
styrofoam meat trays
Swift-GH Microscope
Skeletons by S. Parker (Knopf)



BACKGROUND:

Owls swallow their prey nearly whole, however, the fur and bones of their prey cannot be digested. The food goes into the proventriculus which is found just before the gizzard. (Owls do not have crops like many other birds.) As food starts to digest in the gizzard, the muscles separate the fur from the bones. The fur and bones are then pushed forward to the proventriculus. About 12 hours after eating their prey owls spit out a "pellet," an ellipsoidal to spherical glop. Owl pellets are clean of all flesh and odorless.

The pellets that your students have in the kit are from a wild Great Horned owl. This owl hunts rabbits, rodents, and birds. The owl is about 18-25 inches in height. The ear tufts are set wide apart, and the owl has yellow eyes. The body feathers are a mottled gray brown in the upper body and a fine dark gray horizontal barring below. The Great Horned has a deep resonant hooting, "hoo, hoo-hoo, hoo." The materials for this kit are from the San Francisco Bay area, but Great Horned owls range in all of North America up to the northern tree limit. They build nests in trees, crevices or cliffs with 2 or 3 white eggs.

PROCEDURE:

1. Each pair of students should get an owl pellet, a microscope or hand lens, a tweezer or any instrument that can separate the bones from the pellets. Students may use their hands, but caution them that the bones are little and not to break them.
2. Instruct students to separate the fur from the bones and then have them look

carefully at their contents. Have them record the information on their lab sheet. Point out to students that on their lab sheet there are some clues to the type of mammal that they will find in their sample. Use the enclosed sheet so students can find what part of the animal the bone is from.

3. Have the students put the remains back in the bag, so they can be reused. If you want them to look like when they were coughed up, put a little water on the material and stick it back together. Make sure that you dry them up before you seal the bags. You should leave one pellet together, so students can see what a complete pellet looks like.

If you have access to owl pellets, you can have the students paste the bones down and make a display. Label the different bones.

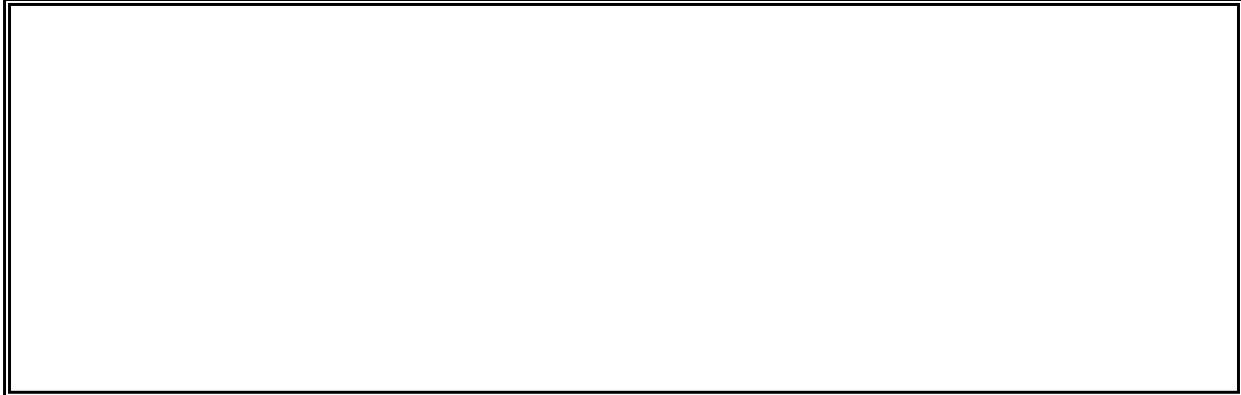
LIFE CYCLE - NATURAL ENVIRONMENT (2B)

PROBLEM: Can one determine what the food chain of an owl is?

PREDICTION: _____

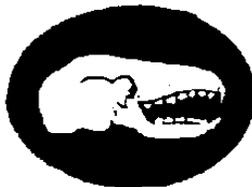
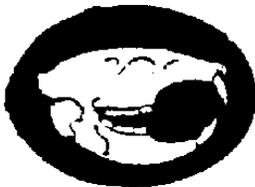
MATERIALS: owl pellets, fork, styrofoam meat tray, microscope or hand lens

PROCEDURE: Place the pellet on the meat tray and carefully separate the fur from the bones. Look at the fur under the microscope and draw what you see.

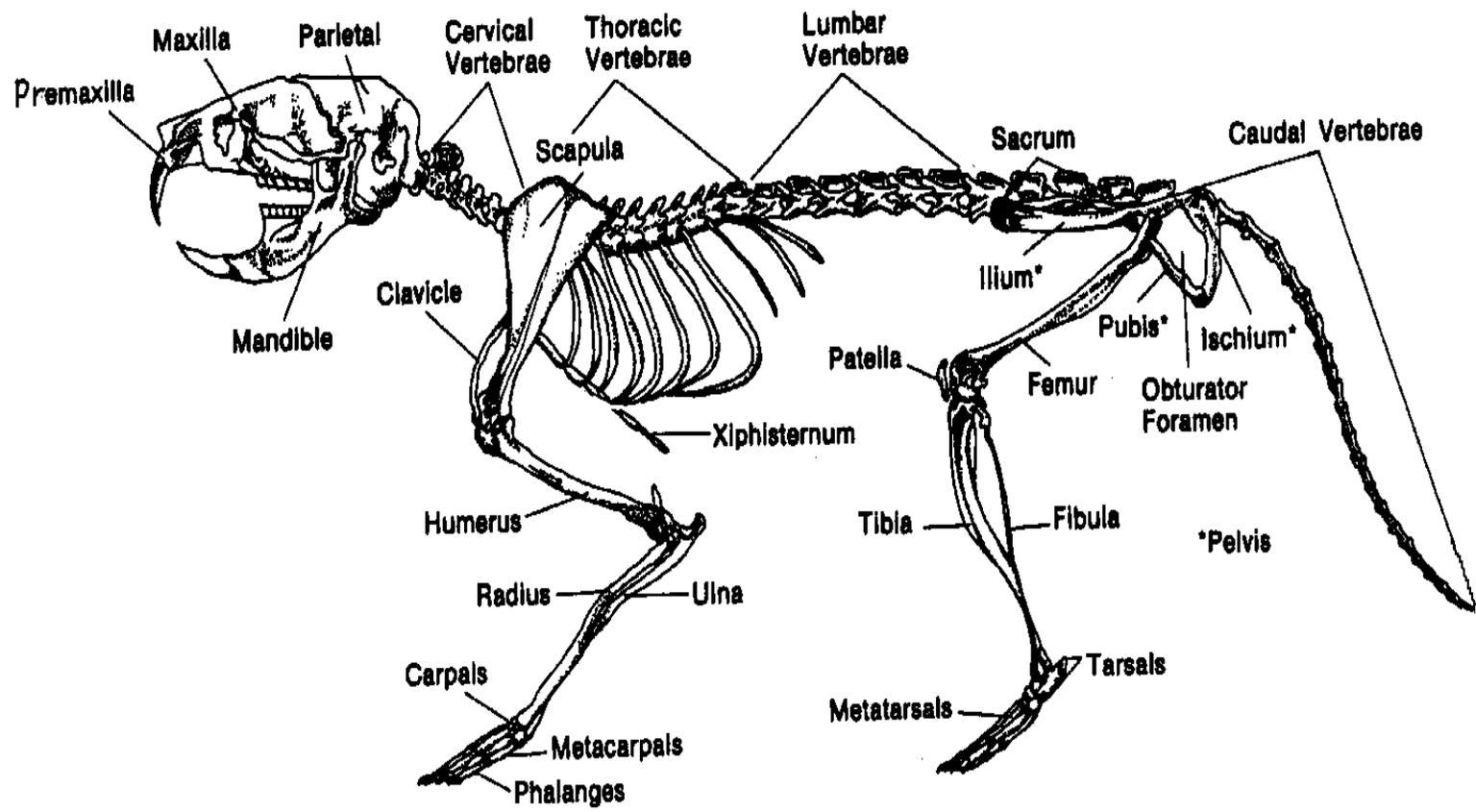


Look at the bones with your microscope or hand lens and see if you can determine some of the bones. Refer to the Eyewitness Book on Skeletons. Record what types of bones you see.

Look at the skull of the critter. Does it look like any of the pictures below. Circle the one it looks like. Can you guess what the animal the owl ate looked like?



CONCLUSIONS: What is the food chain of this Great Horned Owl?



LIFE CYCLE - NATURAL ENVIRONMENT (2B)

POST LAB

Students look in newspapers for environmental articles.

OBJECTIVES:

1. Exploring your local natural environment.
2. Discussing the importance of keeping natural environments.

VOCABULARY:

ecology
environment
garbage

MATERIALS:

newspaper headlines on environmental issues (if you have a banner maker on your computer have students make their own headlines)
Internet



BACKGROUND:

Humans can alter their surroundings. Some people change their world to enjoy their surroundings, others do not own the technology to change it. America is the most technologically equipped society. However, problems will arise if a society does not think about how technology impacts the natural environment.

For instance, garbage is a problem in urban areas. People have to develop ways to control the garbage problem. Ask students what the consequences are if garbage is not disposed of correctly. Is all garbage the same? What happens when a bad chemical is mixed with water? Is this bad garbage? What kind of garbage causes disease and what kind will just be unsightly and create a smelly mess?

There is much written in the papers about how we should use environmentally safe products, but what does this mean? Is there good garbage versus bad garbage. There are many sides to the issue and to discuss this with students will get them to realize that the debate sometimes does not have an answer. Each year the crisis is different, and in each state or country the problem is also different.

PROCEDURE:

1. Try to get students to save newspaper articles about the environment and discuss the issues that seem to be more pressing. Make sure that they understand what

environmental issues may include. Issues like saving trees or preventing pollution is environmental as well as water issues, building homes, freeways, or flood control.

You may want students to look through the newspapers and find “environmentally friendly” products. Discuss if the products really are good to the environment or is it just a marketing scheme to get people to buy more products.

2. If you have access to the Internet, you can have each child find a story on the environment. Teach students on how to use a search engine for children (i.e. www.yahooligans.com).

3. Have students give an oral report on what they found.