

Big Science Ideas

A Closer Look at Scientific Categories of Living Things

Earth is populated by an enormous range of animals which, for all of their differences, are interdependent and share many characteristics. Consequently, students are curious about the diversity of life on the planet, the life cycles and habitats of different animals, and their own place in the natural world. The *Big Science Ideas* Teacher Guide serves to fuel further exploration of the diversity of the animal kingdom. By using this guide, you have an opportunity to tap into high student interest while exposing students to broader scientific issues.

Participation in these lessons will lead students to make global connections and understand higher-level concepts, such as the characteristics, life cycles, and habitats of different animals. Students will become aware of some of the issues involved in preserving biodiversity and balance. They will realize that as human beings, they are also animals with a place in the natural order.

The lesson plans in this guide are tailored for grades 2–4 and address various subjects, such as science, social studies, language arts, mathematics, and art. Each lesson plan is designed to stand alone. As such, they do not need to be presented in sequential order. Helpful reproducible worksheets appear at the end of the guide. The book titles referenced in this guide include:

What Is a Carnivore?

What Is an Omnivore?

What Is a Herbivore?

What Is a Vertebrate?

As students investigate the topics addressed in the guide and become more aware of the characteristics that define different animal species, they will sharpen their critical thinking skills to work towards creative solutions to worldwide problems. We invite you to jump in and ask questions with your class as you have fun learning more about biological diversity and balance.



National Standards Correlation

Lesson Plan Title	Correlation to National Standards
Predator Posters	<p>Language Arts Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.</p> <p>Science Students should develop understanding of the characteristics of organisms. Students should develop understanding of the life cycles of organisms. Students should develop understanding of organisms and environments.</p>
Follow the Food Chain	<p>Science Students should develop understanding of the characteristics of organisms. Students should develop understanding of the life cycles of organisms. Students should develop understanding of organisms and environments. Students should develop understanding of changes in environments.</p>
A Treat for the Birds	<p>Math Students should understand measurable attributes of objects and the units, systems, and processes of measurement.</p> <p>Science Students should develop understanding of the characteristics of organisms. Students should develop understanding of organisms and environments. Students should develop abilities to distinguish between natural objects and objects made by humans.</p>
Herbivore Trading Cards	<p>Language Arts Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.</p> <p>Science Students should develop understanding of the characteristics of organisms. Students should develop understanding of the life cycles of organisms. Students should develop understanding of organisms and environments.</p>

Lesson Plan Title	Correlation to National Standards
Keep It Balanced	<p>Math Students should understand measurable attributes of objects and the units, systems, and processes of measurement. Students should understand situations that entail multiplication and division, such as equal groupings of objects and sharing equally.</p> <p>Science Students should develop understanding of personal health.</p> <p>Social Studies The learner can distinguish between needs and wants.</p>
Omnivores in Your Neighborhood	<p>Language Arts Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.</p> <p>Science Students should develop understanding of the characteristics of organisms. Students should develop understanding of the life cycles of organisms. Students should develop understanding of organisms and environments.</p>
More About Bones	<p>Science Students should develop abilities necessary to do scientific inquiry. Students should develop understanding of the characteristics of organisms. Students should develop an understanding of personal health.</p>
Match the Vertebrates	<p>Language Arts Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).</p> <p>Science Students should develop understanding of the characteristics of organisms. Students should develop understanding of organisms and environments.</p>

For state specific educational standards, please visit <http://www.crabtreebooks.com/>.

Overview and Scope of Lesson Plan Activities

Lesson Plan Title	Subject Areas	Major Concepts
Predator Posters	Art Language Arts Science	<ul style="list-style-type: none"> • characteristics of carnivores • conducting research • layout and design • presenting information
Follow the Food Chain	Art Language Arts Science	<ul style="list-style-type: none"> • food chains • interdependence of living things • local ecosystems • presenting information
A Treat for the Birds	Math Science	<ul style="list-style-type: none"> • constructing a simple bird feeder • observing and identifying bird species • characteristics of herbivores • parts of plants
Herbivore Trading Cards	Art Language Arts Science	<ul style="list-style-type: none"> • characteristics of herbivores • biodiversity • conducting research • informational writing
Keep It Balanced	Health Math Science Social Studies	<ul style="list-style-type: none"> • nutrition and dietary balance • food groups • characteristics of human beings • using charts and tables
Omnivores in Your Neighborhood	Language Arts Science	<ul style="list-style-type: none"> • local ecosystems • characteristics of omnivores • observing and identifying animals • recording information
More About Bones	Art Movement Science	<ul style="list-style-type: none"> • skeletal systems • human biology • presenting information
Match the Vertebrates	Art Science	<ul style="list-style-type: none"> • characteristics of vertebrates • classifying animals • playing games

Pacing Chart and Vocabulary

One class period is approximately 40 minutes.

Lesson Plan Title	Pacing	Vocabulary		Assessment
Predator Posters	2–3 class periods	carnivore habitat predator prey		Check reproducibles for accuracy and completeness. Evaluate group posters for accuracy, comprehensiveness, and creativity.
Follow the Food Chain	2 class periods	carnivore energy food chain herbivore		Evaluate food chains for accuracy and completeness.
A Treat for the Birds	1–2 class periods	bird log birdfeeder herbivore		Student birdfeeders should be fully functional. Check group reproducibles for completeness and accuracy.
Herbivore Trading Cards	1–2 class periods	folivore frugivore granivore grazer	nectarivore palytivore xylophage	Evaluate trading cards for completeness and factual accuracy.
Keep It Balanced	1–2 class periods	balanced Food Guide Pyramid nutritious omnivore		Check reproducibles for accuracy and completeness. Student meals should include foods from all groups and should not exceed the recommended servings for any person or group.
Omnivores in Your Neighborhood	1–2 class periods	bird insect mammal omnivore reptile		Check reproducibles for accuracy and completeness.
More About Bones	2–3 class periods	backbone breastbone cartilage femur hipbone humerus	joint ribs skeleton skull tibia vertebrate	Check reproducibles and group body outlines for accuracy and completeness.
Match the Vertebrates	1–2 class periods	amphibian classes mammal vertebrate	bird fish reptile	Check cards for neatness and accuracy.

Predator Posters

A Lesson on Predators and Their Habitats

Content

Students will learn about predators through research and present information about their classes, sizes, habitats, and prey to the class.

National Standards

The following standards will be addressed in the lesson:

Language Arts

Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.

Science

Students should develop understanding of the characteristics of organisms.

Students should develop understanding of the life cycles of organisms.

Students should develop understanding of organisms and environments.

Multiple Intelligences

The following intelligences will be activated throughout the lesson:



Interpersonal



Linguistic



Naturalistic



Visual-Spatial

Prerequisites

Students should read the book *What Is a Carnivore?* to familiarize themselves with predators. Have them pay particular attention to which animals are predators and how they hunt. Students should also review basic research skills.

Materials

- *What Is a Carnivore?* books
- pictures of predators from nature magazines
- student copies of the *Predator Posters* reproducible
- access to the school library
- poster board (one per group)
- markers
- additional nature magazines
- scissors
- tape or paste

Instructional Procedure

Anticipatory Set

Before class begins, cut out pictures of different predators from nature magazines. Choose predators that students are likely to recognize, such as lions, tigers, eagles, sharks, and alligators.

To begin the lesson, write the words *predator* and *prey* on the board, and ask students to define the terms. (*Predators* are carnivores that hunt and eat other animals. *Prey* are animals that predators hunt.) Have students identify where the terms are defined in *What Is a Carnivore?* (pages 6–7)

Class Discussion

Distribute the pictures of the predators to students one at a time. As each picture is passed around the class, ask: *What is this predator called?* Students should be able to identify the predators easily. Write the names of the predators on the board. Ask: *What do you know about this predator?* Students may share basic information about predators, including where they can be found and whether they are mammals, reptiles, fish, or birds. Write student responses on the board. Repeat this discussion for each picture.

Objectives

The student will be able to...

- define *predator* and *prey*
- identify predators in pictures
- answer questions about predators' classes, sizes, and habitats
- work in groups to research predators and create posters

Activity

Part I: Learn About a Predator

Explain to the class that they will create posters about the predators they have identified. Place students in small groups. If possible, allow groups to choose which predator they will research; otherwise, assign one predator to each group. Give each group the picture of the predator they will research, and distribute student copies of the *Predator Posters* reproducible. Then, have groups use library resources to answer the questions on the reproducible.

Part II: Create Predator Posters

When students have completed the reproducible, distribute poster board, markers, magazines, scissors, and tape or paste to the groups. Students may want to plan their posters on paper before they begin drawing on the poster board. Tell students to include on their posters the picture given to the group in part I, information from the reproducible, and additional pictures clipped from the magazines. Students may also include their own drawings of predators.

Accommodations and Extensions

Have students work in mixed-ability groups to research predators. You may want to provide the groups with one or two illustrated reference books on the predators to help them get started.

As an extension, have students find additional information about the predators. For example, you may ask students to find out if the predator hunts alone or in a pack, or if it is an endangered species.

Closure

Have groups present their posters to the class and share information about their predators. Encourage students to ask questions about each predator. When student presentations are complete, display the posters in the classroom.

Assessment

Check reproducibles for accuracy and completeness. Evaluate group posters for accuracy, comprehensiveness, and creativity.

Follow the Food Chain

A Lesson on the Relationship among Plants, Herbivores, and Carnivores

Content

Students will develop their understanding of how energy passes from one living thing to another by tracking a food chain.

National Standards

The following standards will be addressed in the lesson:

Science

Students should develop understanding of the characteristics of organisms.

Students should develop understanding of the life cycles of organisms.

Students should develop understanding of organisms and environments.

Students should develop understanding of changes in environments.

Multiple Intelligences

The following intelligences will be activated throughout the lesson:



Interpersonal



Naturalistic



Visual-Spatial

Prerequisites

Students should read the book *What Is a Carnivore?* to familiarize themselves with the concept of a food chain. Students should also understand that the different regions of the Earth have their own ecosystems.

Materials

- *What Is a Carnivore?* books
- student copies of the *Follow the Food Chain* reproducible (one per group)
- scissors
- poster board (one per group)
- markers
- glue or double-sided tape
- copies of nature magazines, if available

Instructional Procedure

Anticipatory Set

Have students open their *What Is a Carnivore?* books to pages 26–27. Write the heading *Food Chain* on the board and ask students to explain what a food chain is. (A food chain is energy passing from one living thing to another.) Write student responses on the board. Remind students that all living things need food for energy. Plants use the sun's energy to make their food from air and water. Plants pass that energy to *herbivores*, or animals that eat plants. The energy passes to *carnivores*, or animals that eat other animals, when they eat the herbivores.

Class Discussion

Tell students that predators are at the ends of food chains. Ask: *What is a predator?* (an animal that hunts and eats other animals) Write the words *lion*, *shark*, *alligator*, and *coyote* on the board and have students read aloud about these animals on pages 6, 13, 18–19, and 25 of *What Is a Carnivore?* Tell students that lions live in Africa and then ask: *Where do the other animals live?* (Sharks live in the ocean. Alligators live in swamps. Coyotes live in North America.) Remind students that each of these animals is a predator in a different food chain.

Objectives

The student will be able to...

- define and explain *food chain* and *predator*
- understand the relationships among plants, herbivores, and carnivores
- recognize that different food chains exist in different ecosystems
- create posters depicting food chains

Activity

Tell students that they will construct food chains for one of the predators on the board. Place students in small groups and assign each a predator. Then, distribute student copies of the *Follow the Food Chain* reproducible, scissors, poster board, markers, glue or double-sided tape, and nature magazines (if available).

Have groups follow these directions to construct their food chains:

1. Cut out the cards on the reproducible.
2. Choose the cards to use in the food chain. Begin with the predator assigned to your group. Next, choose the animal or animals the predator eats. If the animals the predator eats also eat animals, choose those cards also. Then, choose the plant or plants those animals eat.
3. Begin constructing your food chain on the poster board. Use markers to draw the sun at the top of the chain. Then, paste or tape the cards under the sun, beginning with the plants and ending with the predator. Draw arrows between the cards to show the transfer of energy down the chain.
4. Cut out or draw pictures of the animals and plants in your food chain and paste or tape them next to the corresponding card on the poster board.

Accommodations and Extensions

After students cut out the cards on the *Follow the Food Chain* reproducible, help them sort the cards. For example, cards can be sorted by region. Plants can also be separated from animals. After sorting the cards, help students construct their chains by asking what their predator eats.

As an extension, have students use the Internet to find additional plants and animals and include them in the food chain.

Closure

Have groups present their food chains to the class. Then, discuss the interdependence of the plants and animals in the food chain. Explain that each plant and animal is important, and ask students what would happen if one link was missing from the chain. (If the predators were missing, the herbivores would eat all of the plants. If the herbivores were missing, the predators would starve. If the plants were missing, the herbivores would starve.)

Assessment

Evaluate food chains for accuracy and completeness.

A Treat for the Birds

A Lesson on Feeding and Identifying Herbivorous Birds

Content

Students will build birdfeeders and then strengthen their understanding of herbivores by observing and identifying birds that visit the birdfeeders.

National Standards

The following standards will be addressed in the lesson:

Math

Students should understand measurable attributes of objects and the units, systems, and processes of measurement.

Science

Students should develop understanding of the characteristics of organisms.

Students should develop understanding of organisms and environments.

Students should develop abilities to distinguish between natural objects and objects made by humans.

Multiple Intelligences

The following intelligences will be activated throughout the lesson:



Interpersonal



Naturalistic



Visual-Spatial

Prerequisites

Students should read the book *What Is a Herbivore?* to familiarize themselves with the various plant foods eaten by herbivores. They should pay particular attention to foods eaten by birds. Students should also practice observation and note-taking skills.

Materials

- *What Is a Herbivore?* books
- illustrated reference books on local birds
- empty cardboard egg cartons
- scissors
- pushpins
- string
- rulers
- birdseed
- student copies of the *A Treat for the Birds* reproducible

Instructional Procedure

Anticipatory Set

Ask: *What is a herbivore?* Students should recognize that a herbivore is an animal that eats mainly plants. Remind students that many different plants and plant parts can be food for herbivores. Ask students to name some of the plants and plant parts that herbivores eat. (grasses, leaves, fruits, nectar, pollen, seeds, wood) Write student responses on the board. Encourage students to refer to *What Is a Herbivore?* for names of plants and plant parts.

Class Discussion

Remind students that some birds are herbivores, and explain that many birds that eat insects also eat plants. Ask: *What parts of plants to birds eat?* (fruit, nectar, seeds)

Use the reference books to share pictures of local birds with students. If possible, put large pictures of local birds at the front of the room. Identify each bird and tell students what the different birds eat. Ask students if they have seen these birds in places such as the park or their neighborhoods. Encourage students to tell the class where and when they saw each bird. Ask: *Which birds are your favorites? Why?* (Student responses will vary, but students are likely to identify colorful birds with recognizable songs as their favorites.) Tell students they will make birdfeeders.

Objectives

The student will be able to...

- identify plant foods eaten by herbivores
- build simple birdfeeders
- observe and identify birds in nature
- use basic reference materials

Activity

Part I: Making Birdfeeders

Place students in small groups and distribute egg cartons, scissors, pushpins, string, rulers, and birdseed. Or, make birdseed available to groups at the front of the room. Have groups follow these steps to make their birdfeeders:

1. Cut off the top of the egg carton and discard. (If possible, recycle the tops.)
2. Use the pushpins to poke holes in each corner of the egg carton bottom.
3. Cut four pieces of string approximately 10 inches in length. Tie one piece to each of the holes at the corners.
4. Pour bird seed into each section or cup of the egg carton.
5. Gather the loose ends of the strings and tie them together. You should be able to lift the bird feeder by the knot.

On a nice day, take groups outside to hang their birdfeeders in trees outside the classroom. Remind students to choose locations where their birdfeeders will be visible from inside the classroom.

Part II: Keeping a Bird Log

Explain to students that each group will keep a log and use reference books to identify which birds come to the group's birdfeeder to eat. Distribute student copies of the *A Treat for the Birds* reproducible and the illustrated reference books on local birds. Review the reproducible directions with students. Set aside approximately fifteen minutes of class time over several days for groups to observe the birdfeeders and record their observations.

Accommodations and Extensions

Assist groups with filling in their bird logs. For example, after students have written descriptions of the birds, help them use the reference books to find the birds' names.

As an extension, have students choose a local bird to research. Have students find out where else the bird lives, where it builds its nest, and what it eats in addition to birdseed. Have students share their findings with the class.

Closure

Have groups share their bird logs with the class. As groups present their observations, write the names of the birds on the board. Then, discuss the varieties of birds that visited the birdfeeders. Which birds did students see most often? Which birds appeared only once or twice?

Assessment

Student birdfeeders should be fully functional. Check group reproducibles for completeness and accuracy.

Herbivore Trading Cards

A Lesson on the Characteristics of Herbivores

Content

Students will develop an appreciation of the diversity of herbivorous life by creating factual trading cards on a wide range of different herbivores.

National Standards

The following standards will be addressed in the lesson:

Language Arts

Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.

Science

Students should develop understanding of the characteristics of organisms.

Students should develop understanding of the life cycles of organisms.

Students should develop understanding of organisms and environments.

Multiple Intelligences

The following intelligences will be activated throughout the lesson:

-  Interpersonal
-  Linguistic
-  Naturalistic
-  Visual-Spatial

Prerequisites

Students should read the book *What Is a Herbivore?* to familiarize themselves with different animals that rely on plants for food. They should also understand that different kinds of foods come from plants.

Materials

- *What Is a Herbivore?* books
- student copies of the *Herbivore Trading Cards* reproducible
- scissors
- access to the Internet
- colored pencils or markers

Instructional Procedure

Anticipatory Set

Write the word *Herbivore* on the board and ask students to define the term. (A herbivore is an animal that eats mainly plants.)

Then, ask students what kinds of animals are herbivores.

Students should recognize that herbivores live on land, in the ocean, and in the air, and include mammals, birds, and insects.

Students may also note that herbivores include very large animals such as hippos and elephants, and very small animals such as hummingbirds and bees.

Class Discussion

Tell students that herbivores eat many different plants and parts of plants, and ask if they can name some of the plant foods herbivores eat. (grasses, leaves, fruit, nectar, pollen, seeds, wood, flowers) Some herbivores eat mainly one kind of plant food.

Remind students that these herbivores have special names.

Then, copy the following terms from page 30 of *What Is a Herbivore?* onto the board: *grazer*, *folivore*, *frugivore*, *nectarivore*, *palynivore*, *granivore*, and *xylophage*.

Ask students if they can identify what each of these kinds of herbivores eat. (Grazers eat grasses, folivores eat leaves, frugivores eat fruit, nectarivores eat nectar, palynivores eat pollen, granivores eat grains, and xylophages eat wood.) If students are uncertain, have them refer to the answers on page 30. Tell students they will learn more about different kinds of herbivores.

Objectives

The student will be able to...

- define *herbivore* and recognize terms for herbivores that eat specific plant foods
- appreciate the diversity of herbivores
- recognize similarities and differences among herbivores
- use appropriate Internet search engines with teacher assistance

Activity

Part I: Choosing Herbivores

Place students in small groups and tell them they will create factual trading cards for different herbivores. Assign one of the following kinds of herbivores to each group: herbivores that eat grasses; herbivores that eat leaves; herbivores that eat fruit; herbivores that eat nectar and pollen; herbivores that eat grains and wood. Have groups list all of the herbivores in their category that are described in *What Is a Herbivore?* Tell students to choose four of the herbivores they've listed for trading cards. Then, distribute student copies of the *Herbivore Trading Cards* reproducible, scissors, and colored pencils or markers. Have students cut out the cards and write the names of the four herbivores on them.

Part II: Guided Web Search

Put groups at computers with Internet access and have them open student-friendly search engines. Tell students to use the name of each herbivore as a search term. Help students select appropriate Web sites from the search results. Then, have students use the information from the Web sites to answer the questions on the card. Students should use colored pencils or markers to draw pictures of each herbivore on the reverse side of the card.

Accommodations and Extensions

Before class begins, select four herbivores from one of the categories and find appropriate Web sites for each. Then, assign these herbivores and Web sites to a group.

As an extension, have students use Internet resources to find herbivores in their category that do not appear in *What Is a Herbivore?* and create trading cards for them.

Closure

Remind students that each group's herbivores are linked because they eat similar foods. Explain that there are different connections among the herbivores. To illustrate, ask students to bring group cards for mammals together. Then, have students group cards for reptiles or for insects. Repeat these steps to group herbivore trading cards by habitat.

Assessment

Evaluate trading cards for completeness and factual accuracy.

Keep It Balanced

A Lesson on Balanced Nutrition for People

Content

Students will learn about the United States Department of Agriculture Food Guide Pyramid. They will develop an understanding of the importance of eating a variety of foods by planning a balanced meal.

National Standards

The following standards will be addressed in the lesson:

Math

Students should understand measurable attributes of objects and the units, systems, and processes of measurement.

Students should understand situations that entail multiplication and division, such as equal groupings of objects and sharing equally.

Science

Students should develop understanding of personal health.

Social Studies

The learner can distinguish between needs and wants.

Multiple Intelligences

The following intelligences will be activated throughout the lesson:



Interpersonal



Logical-Mathematical



Visual-Spatial

Prerequisites

Students should read the book *What Is an Omnivore?* to familiarize themselves with the range of foods omnivores eat. Students should also be able to distinguish between foods that are plant products and foods that are animal products.

Materials

- *What Is an Omnivore?* books
- student copies of the *Keep It Balanced* reproducible
- measuring cups and spoons

Instructional Procedure

Anticipatory Set

Before class begins, copy the Food Guide Pyramid from the reproducible onto the board. Include the recommended servings per day from each food group.

To begin the lesson, remind students that herbivores are animals that eat mainly plants, and carnivores are animals that eat mainly other animals. Ask: *What is an omnivore?* (An omnivore is an animal that eats both plants and other animals.) Then, have students open their *What Is an Omnivore?* books to pages 30–31 and read the text aloud with the class. Tell students *nutritious* foods help the body grow and stay healthy. Then, ask: *What nutritious foods do you like to eat?* Students are likely to mention a wide range of foods, including pasta, cheese, and fruit.

Class Discussion

Refer to the Food Guide Pyramid on the board and explain that the pyramid is a guide to help people choose nutritious foods to eat. Review the food groups and ask students for examples of foods from each group. (Bread, Cereal, Rice, and Pasta Group: bread, spaghetti; Vegetable Group: lettuce, carrots; Fruit Group: apples, bananas; Milk, Yogurt, and Cheese Group: cheese, yogurt; Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts Group: hot dogs, chicken; Fats, Oils, and Sweets Group: cake, butter) Point out that nutritious foods come from plants and animals. Ask: *Which foods come from animals? Which foods come from plants?* (From animals: cheese, yogurt, hot dogs, chicken, butter; from plants: bread, spaghetti, lettuce, carrots, apples, bananas)

Objectives

The student will be able to...

- define *omnivore*, *nutritious*, and *balanced*
- identify different kinds of food by category
- understand the importance of balanced diets
- plan a nutritionally balanced meal

Activity

Part I: What Is a Balanced Meal?

Write the word *Balanced* on the board and ask students what they think it means. (stable; taking everything into account; including the right amounts) Tell students that a *balanced* diet includes foods from all of the food groups and gives people the nutrients they need. Point out that the pyramid also includes recommended servings per day for each food group. Review the following serving sizes with students, using measuring cups and spoons to demonstrate cups, ounces, and tablespoons. Note that one serving size equals the following:

- 1 slice of bread
- ½ cup of cooked rice or pasta
- 1 cup of raw vegetables, like lettuce or spinach
- ½ cup of cooked vegetables
- 1 apple, banana, or orange
- ¾ cup of fruit juice
- 1 cup of milk or yogurt
- 1½ ounces of cheddar cheese
- 2–3 ounces of cooked lean meat, chicken, or fish
- ½ cup of cooked beans
- 2 tablespoons of peanut butter

Part II: Planning a Balanced Meal

Place students in small groups. Distribute student copies of the *Keep It Balanced* reproducible and review the directions. On the board, model planning a healthy dinner for four people that includes all the food groups—for example, eight ounces of chicken, two cups of brown rice, two cups of cooked broccoli, four cups of green salad, four slices of whole-grain bread, and two cups of poached pears. Then, have groups complete the reproducibles by planning healthy dinners of their own.

Accommodations and Extensions

Have students work in mixed-ability groups to plan a meal for two people, instead of four. Give students a list of ingredients to choose from as they plan their meals. For example, have students choose from items such as chicken, hard-boiled eggs, broccoli, carrots, tomatoes, apples, grapes, wheat bread, rice, and spaghetti.

As an extension, have students plan healthy meals for an entire day. Have extra copies of the reproducible available.

Closure

Have groups present their meals to the class. Ask students which meals they would enjoy eating, which meals they would not enjoy, and what foods they might substitute in the meals.

Assessment

Check reproducibles for accuracy and completeness. Student meals should include foods from all groups and should not exceed the recommended servings for any person or group.

Omnivores in Your Neighborhood

A Lesson on Native Omnivores and Their Habitats

Content

Students will develop an appreciation of the diversity of native wildlife in their region by observing, identifying, and describing animals on a nature walk.

National Standards

The following standards will be addressed in the lesson:

Language Arts

Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.

Science

Students should develop understanding of the characteristics of organisms.

Students should develop understanding of the life cycles of organisms.

Students should develop understanding of organisms and environments.

Multiple Intelligences

The following intelligences will be activated throughout the lesson:



Bodily-Kinesthetic



Interpersonal



Linguistic



Naturalistic



Visual-Spatial

Prerequisites

Students should read the book *What Is an Omnivore?* to familiarize themselves with the diversity omnivores. Students should also think about the kinds of animals they see in their daily lives.

Materials

- *What Is an Omnivore?* books
- student copies of the *Omnivores in Your Neighborhood* reproducible
- clipboards
- pencils

Instructional Procedure

Anticipatory Set

Before class begins, identify a local park, neighborhood, forest preserve, or other appropriate place for a nature walk. If necessary, get permission to take students outside of the school. Also, make a list of omnivores described in *What Is an Omnivore?* that are native to your state.

To begin the lesson, write the word *omnivore* on the board and ask students to define it. (An omnivore is an animal that eats both plants and other animals.) Then, ask students to name some of the omnivores described in *What Is an Omnivore?* Encourage students to refer to their books. (humans, raccoons, foxes, bears, dogs, house flies, cockroaches, painted turtles, hawksbill sea turtles, sea gulls, blue jays, rheas, chipmunks, rats, skunks, opossums, apes, monkeys) Write student responses on the board. Ask students to identify the classes of the omnivores they name. (mammal, bird, reptile, insect)

Class Discussion

Review the list of omnivores on the board with students. Then, use your list to identify which of these omnivores are native to your state. Ask: *Have you ever seen any of these animals?* Students may have seen common omnivores, such as raccoons, dogs, blue jays, chipmunks, and rats. Depending on the region in which you live, students may also have seen omnivores such as foxes, bears, turtles, and sea gulls. Ask students if they can think of other omnivores that live in the area and write their responses on the board.

Objectives

The student will be able to...

- locate and recall information in a text
- identify and describe omnivores
- work in groups to answer questions about native omnivores
- use basic research materials

Activity

Part I: In the Classroom

Explain to students that they will go on a nature walk to observe animals in nature. Tell students that they should look for animals on the ground, in bushes and trees, in the water, and in the sky. Point out that they will only look at the animals; they must not touch the animals, feed them, or disturb them in any way. Distribute student copies of the reproducible, clipboards, and pencils. Review the directions and have students clip their copies to the clipboards. Remind students that they need to be quiet, pay attention, and follow directions while on the walk.

Part II: Nature Walk

On a nice day, take the class on a nature walk in the school's neighborhood, local park, nature preserve, or other appropriate location. Have students look for animals and write the names, classes, and descriptions of the animals they see on the reproducible. You may want to have extra copies of the reproducible available. Make sure the class stays together, and encourage students to be quiet so they do not frighten the animals. Be prepared to help students identify and describe animals as needed.

Accommodations and Extensions

Have students work in mixed-ability groups to look for animals and complete the reproducible. For example, two students can look for and describe the animals, while a third can keep the list. Alternatively, have students draw pictures of the animals they observe instead of writing descriptions.

As an extension, have students use library resources to find additional information about each animal they observe.

Closure

Have students work in pairs to determine which of the animals they listed on the reproducible are omnivores. Then, have students share their lists with the class. Because they are likely to list many of the same animals, have students take turns identifying and describing one animal at a time. Write student responses on the board. Encourage students to share their thoughts about local wildlife.

Assessment

Check reproducibles for accuracy and completeness.

More About Bones

A Lesson on the Human Skeleton

Content

Students will strengthen their understanding of the skeletal system by identifying major bones in the human skeleton.

National Standards

The following standards will be addressed in the lesson:

Science

Students should develop abilities necessary to do scientific inquiry.

Students should develop understanding of the characteristics of organisms.

Students should develop an understanding of personal health.

Multiple Intelligences

The following intelligences will be activated throughout the lesson:



Bodily-Kinesthetic



Interpersonal



Visual-Spatial

Prerequisites

Students should read the book *What Is a Vertebrate?* to familiarize themselves with the basic skeletal structures of vertebrates. Students should also practice viewing diagrams.

Materials

- *What Is a Vertebrate?* books
- transparency sheets
- reference book with illustrations of a human skeleton
- access to photocopier
- overhead projector and screen
- transparency markers
- student copies of the *More About Bones* reproducible
- butcher paper
- markers
- 11" x 17" white construction paper
- scissors
- tape or glue sticks

Instructional Procedure

Anticipatory Set

Before class begins, photocopy a picture or pictures of a human skeleton from a reference book onto transparency paper. If a reference book illustrating the human skeleton is not available, use the illustration on page 30 of *What Is a Vertebrate?* It is not necessary for the bones in the picture to be labeled.

Ask students to define a *vertebrate*. (A vertebrate is an animal with a backbone.) Then, write the words *Skeleton*, *Cartilage*, and *Joint* on the board. Ask: *What is a skeleton?* (A skeleton is all the bones that support a vertebrate's body.) Ask: *What is cartilage?* (Cartilage is like bone, but it is flexible.) Ask: *What is a joint?* (A joint is a place where two bones come together.) Encourage students to refer to *What Is a Vertebrate?* for answers.

Class Discussion

Review with students the illustrations of different vertebrate skeletons shown throughout *What Is a Vertebrate?* Then, use the overhead projector to show the transparency of a human skeleton. Point out that people are vertebrates. Ask: *How are our skeletons like other vertebrates' skeletons?* (They are made of bones, they have joints, and they have backbones.) Tell students they will learn more about the bones in their own skeletons.

Objectives

The student will be able to...

- define the terms *vertebrate*, *skeleton*, *cartilage*, and *joint*
- name and identify major bones in the human body

Activity

Distribute student copies of the *More About Bones* reproducible. Point out the following major bones on the transparency of the human skeleton: skull, breastbone, ribs, humerus, backbone, hipbone, femur, and tibia. Use transparency markers to model labeling the bones listed above on the transparency and writing the names on the appropriate lines. Then, have students complete the reproducible by writing the names of the bones on the appropriate lines.

Once students have labeled the skeleton, divide students into groups. Ideally, groups should have eight members, but may be smaller depending on class size. Have one volunteer from each group lie down on a sheet of butcher paper. Trace his or her body outline onto the paper. Distribute the markers, construction paper, scissors, and tape or glue sticks. Assign one of the bones discussed above to each group member, and have him or her make a life-sized drawing of it on construction paper, label it, and cut it out. (Assign more bones to each student or fewer bones from the skeleton to classes with smaller groups.) Then, have students refer to the labeled transparency or reproducible to tape or paste the bones in the correct places on their group's body outline. Hang the body outlines around the classroom.

Accommodations and Extensions

Before class begins, prepare copies of the reproducible with the first letter of each bone given on the appropriate line. Have students work in pairs or small groups to complete the reproducible. Also, draw bones on construction paper in advance for students to cut out. Guide students as they label the bones.

As an extension, have students use library resources to find pictures and information about human organ systems and muscle groups. Have students draw and label organs or major muscle groups on the body outlines.

Closure

Lead a discussion about the human skeleton. Ask: *What do you think would happen if we did not have skeletons?* (Our organs would have no protection or support. We could not walk or stand up straight.) Then lead the class in a game of Simon Says and have students point to the major bones in their bodies, as discussed in the activity.

Assessment

Check reproducibles and group body outlines for accuracy and completeness.

Match the Vertebrates

A Lesson on the Characteristics of Vertebrates

Content

Students will learn about different types of vertebrates by examining vertebrate characteristics and matching vertebrates from the same classes.

National Standards

The following standards will be addressed in the lesson:

Language Arts

Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).

Science

Students should develop understanding of the characteristics of organisms.

Students should develop understanding of organisms and environments.

Multiple Intelligences

The following intelligences will be activated throughout the lesson:



Interpersonal



Linguistic



Naturalistic



Visual-Spatial

Prerequisites

Students should read the book *What Is a Vertebrate?* to familiarize themselves with the characteristics and kinds of vertebrates. Students should also be familiar with vertebrate classes such as amphibians, birds, fish, mammals, and reptiles.

Materials

- *What Is a Vertebrate?* books
- student copies of the *Match the Vertebrates* reproducible
- thin cardboard (such as a cereal box) or card stock paper, 8½" x 11" in size
- glue sticks
- markers or colored pencils
- scissors

Instructional Procedure

Anticipatory Set

Ask: *What are some examples of vertebrates?* Have students refer to the book *What Is a Vertebrate?* to help them answer. (Sharks, frogs, turtles, crocodiles, eagles, penguins, horses, and humans are all vertebrates.) Write student responses on the board.

Classroom Discussion

Write the following headings on the board: *Amphibians, Birds, Fish, Mammals, and Reptiles*. Explain to students that the vertebrate animals they mentioned belong to the different *classes*, or groups, that you wrote on the board. Have students use the book to locate information about the characteristics of each class, such as fins, fur, feathers, or wings, and write them on the board under the corresponding class heading. Ask: *Which animals belong to the same class?* (Turtles and crocodiles are reptiles. Eagles and penguins are birds. Horses and humans are mammals.) Write student responses on the board under the appropriate class heading.

Objectives

The student will be able to...

- recognize characteristics of vertebrates
- distinguish between different classes of vertebrates
- match vertebrates within the same class

Activity

Part I: Make Vertebrate Cards

Tell students that they will create cards featuring vertebrates from different classes and play a matching game. Distribute the *Match the Vertebrates* reproducible, thin cardboard sheets or card stock paper, glue sticks, markers or colored pencils, and scissors. Review the directions with students and have them follow these steps to create their vertebrate cards:

1. Paste the reproducible to the cardboard sheet or card stock paper.
2. Use markers or colored pencils to draw one vertebrate animal from each class in each square on the reproducible.
3. Write the name of the vertebrate at the bottom of the square.
4. Cut out the cards.

Part II: Play a Matching Game

Divide the class into pairs and have them follow these rules to play the matching game:

1. Turn the cards face down and shuffle them together (pairs should have ten cards total).
2. Take turns to make a match within the same vertebrate class. For example, the first player turns over two cards. If the vertebrates are from the same class (amphibians, birds, fish, mammals, or reptiles), the player has made a match and gets to keep the cards and take another turn.
3. If the vertebrates are from different classes, the first player turns the cards face down again and the second player takes a turn.
4. When there are no more cards, the player with the most matches wins.

If students have trouble determining if the animals are from the same class, have them refer to their books and ask questions to help them answer during the game, such as *Do the animals have fins or wings? Do the animals have fur or feathers?*

Accommodations and Extensions

Rather than drawing pictures, help students identify one vertebrate from each class in nature magazines. Have students cut out the pictures and paste them into the squares on the reproducible. Help students label the squares with the names and classes of each animal.

As an extension, challenge students to include other vertebrates not listed in the book for each class. Then, have students play the game with four players instead of two.

Closure

When students have finished playing the matching game, have them bring all of the cards to a central location, such as a table or activity rug. Spread out the cards facing up and have students group the vertebrates by class. Ask: *What are some similarities and differences among these vertebrate animals?* (Fish and sharks have gills and fins and live in the water, but shark skeletons are made of cartilage. Hummingbirds and penguins both have wings, but penguins cannot fly and use their wings to swim. Horses and humans have hair on their bodies, but horses walk on four legs and humans walk on two legs.)

Assessment

Check cards for neatness and accuracy.

Predator Posters

Directions: Use library resources to answer the questions. Then, use your answers to make your poster.

1. What is this predator is called?

2. This predator is a (circle one):

mammal reptile bird fish

3. How big is this predator?

4. Where does this predator live?

5. What animals does this predator hunt?

6. Write two more facts about this predator.

Follow the Food Chain

Directions: Cut out the cards. Then, choose the cards you will use in your food chain.

Lion	Shark	Coyote	Alligator
Fish I live in many places. Two places I live are the ocean and the swamps.	Dolphin I live in the ocean.	Turtle I live in many places. One place I live is the swamps.	Antelope I live in Africa.
Zebra I live in Africa.	Giraffe I live in Africa.	Rabbit I live in many places. One place I live is North America.	Snails I live in many places. One place I live is the swamps.
Grasses We grow everywhere.	Sea Grasses and Plankton We grow in the ocean.	Leaves and Green Vegetation We grow everywhere.	Saw Grass I grow in the swamps.

Name _____ Date _____

A Treat for the Birds

Directions: Describe the birds you see at your birdfeeder. Then, look up the names of the birds in an illustrated reference book and write them down.

Month: _____

Location of feeder: _____

Date	Time	What does the bird look like?	What is the bird called?

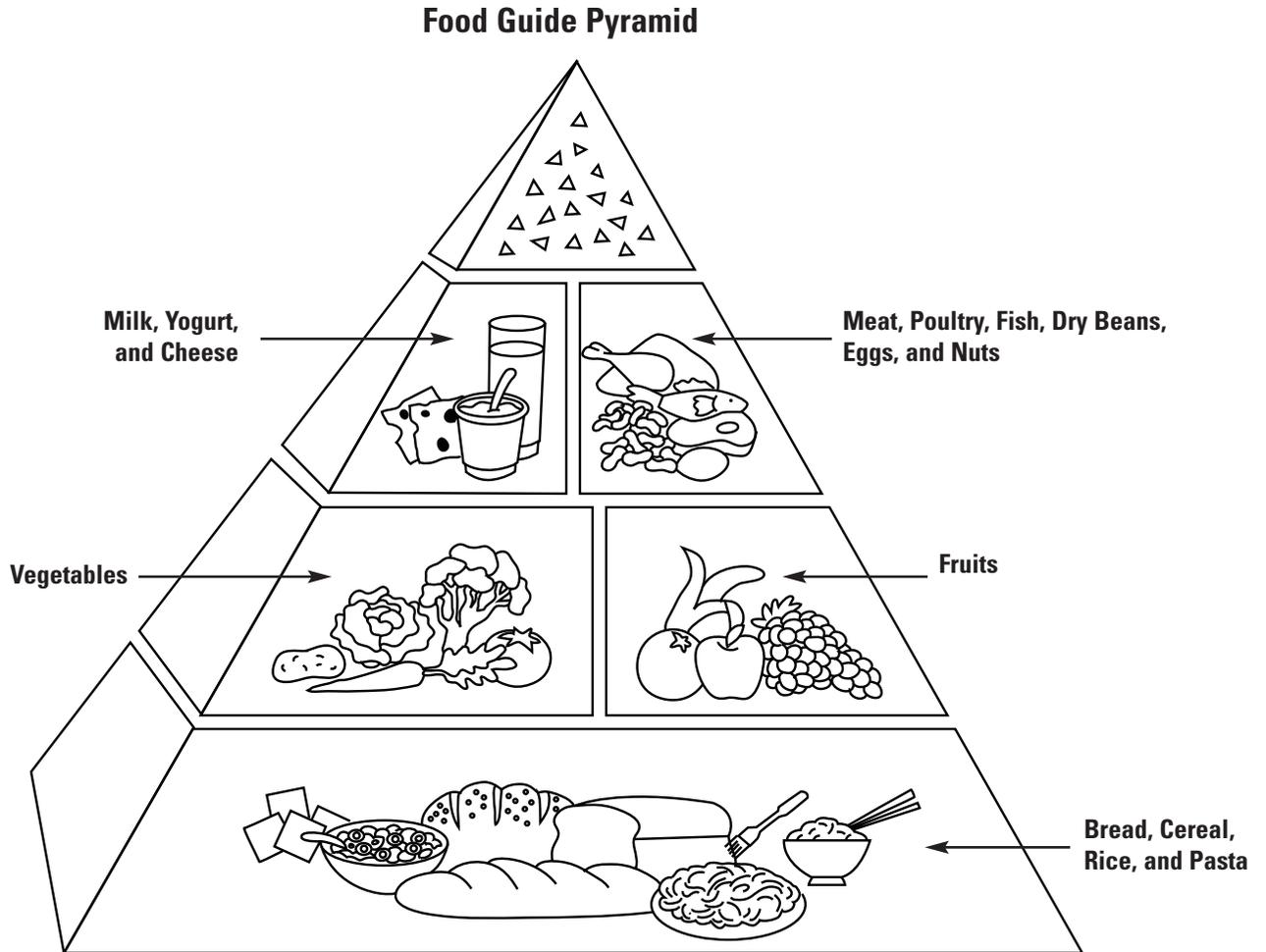
Herbivore Trading Cards

Directions: Cut out the cards and write the names of the herbivores on each. Then, use the Internet to answer the questions. Draw a picture of the herbivore on the back of the card.

<p>This herbivore is called a(n)</p> <hr/> <p>It is a (circle one):</p> <p>mammal bird insect</p> <p>It lives in</p> <hr/> <p>.</p> <p>It eats mainly</p> <hr/>	<p>This herbivore is called a(n)</p> <hr/> <p>It is a (circle one):</p> <p>mammal bird insect</p> <p>It lives in</p> <hr/> <p>.</p> <p>It eats mainly</p> <hr/>
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Keep It Balanced

Directions: Plan a healthy dinner for four people. Choose foods from each group in the Food Guide Pyramid. Write what your dinner will include below.



Food Group	Which foods from this group will you have for dinner?	How much of each food will you need? (ounces, cups, etc.)
Bread, Cereal, Rice, and Pasta		
Vegetables		
Fruits		
Milk, Yogurt, and Cheese		
Meat, Poultry, Fish, Dry Beans, Eggs, and		

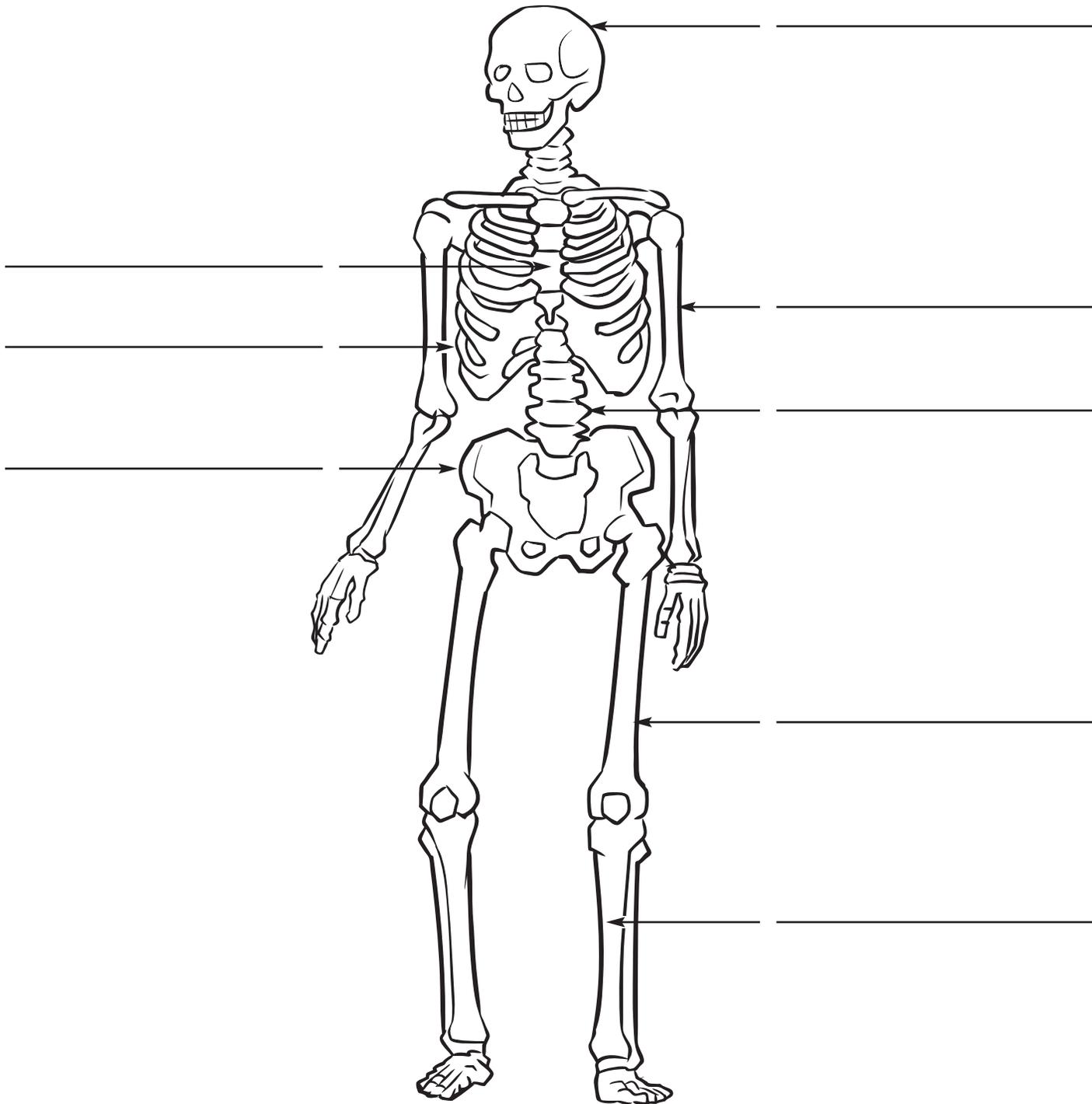
Omnivores in Your Neighborhood

Directions: Write the names of the animals you see. Circle what kinds of animals they are. Then, describe the animals and write if they are omnivores.

Animal's Name	This animal is a(n) (circle one)	What does this animal look like?	Is this animal an omnivore?
	Mammal Bird Reptile Insect		

More About Bones

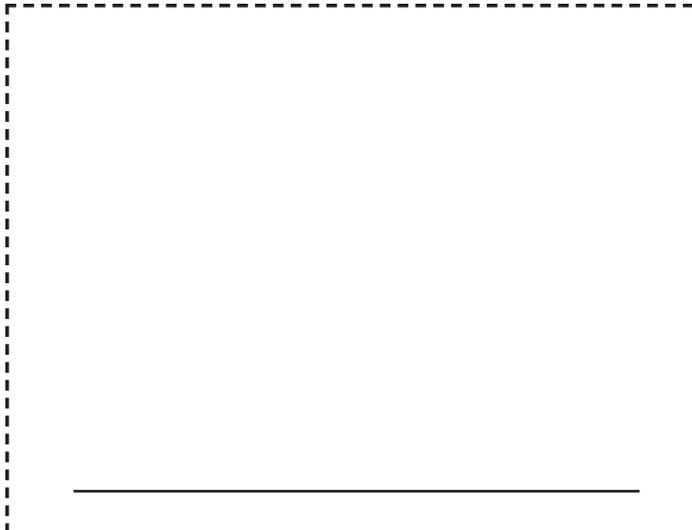
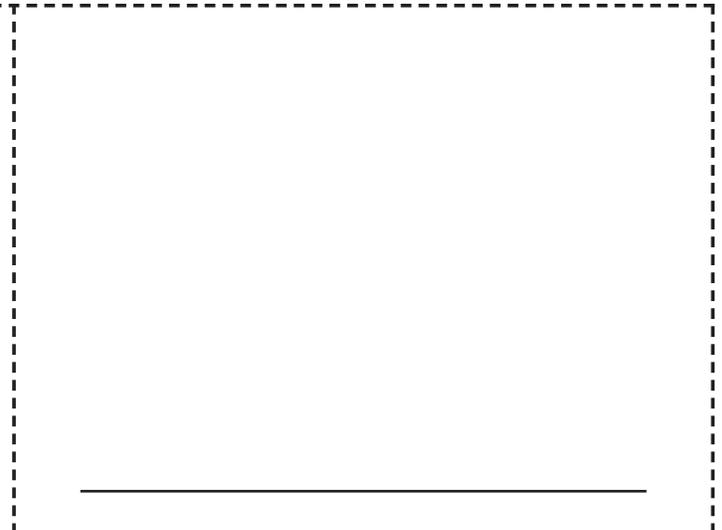
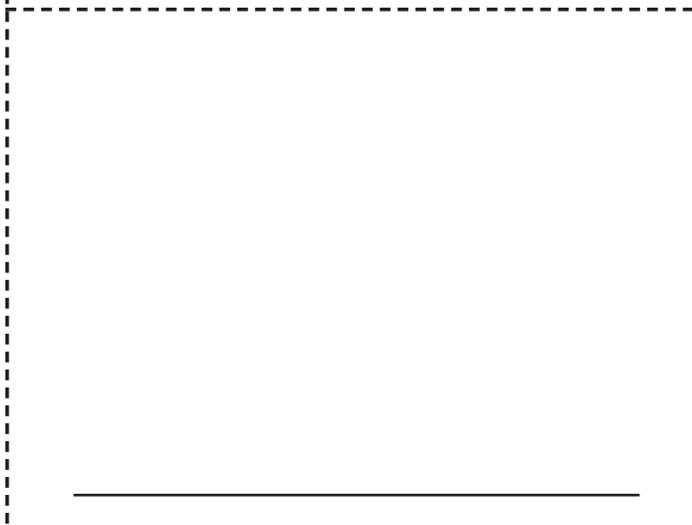
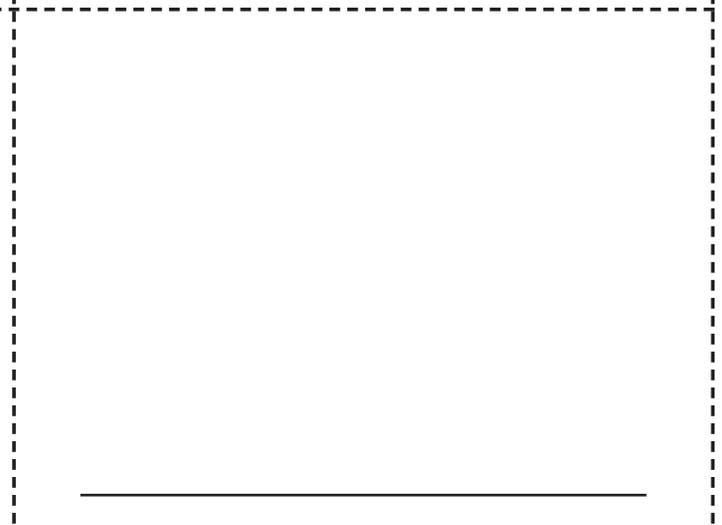
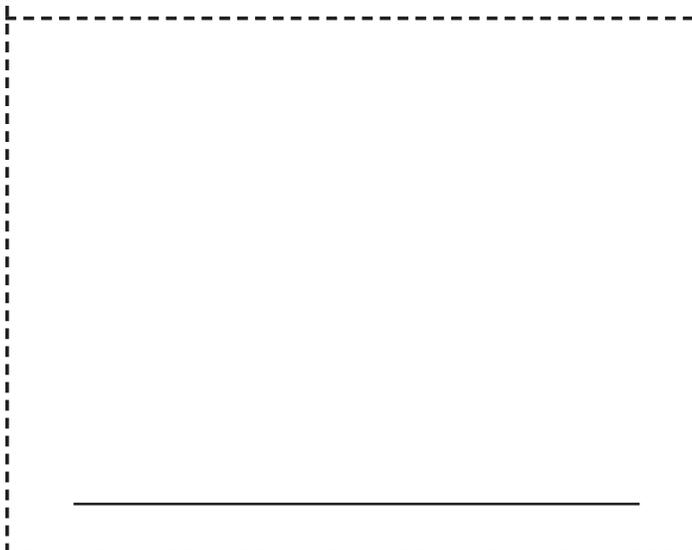
Directions: Match the names at the bottom to the bones in the skeleton. Then, use your answers to make, label, and place bones onto your group's body outline.



- | | | | |
|----------|------------|-------|---------|
| Backbone | Breastbone | Femur | Hipbone |
| Humerus | Ribs | Skull | Tibia |

Match the Vertebrates

Directions: Draw a picture of one vertebrate from each class (amphibians, birds, fish, mammals, and reptiles) in the squares below. Write the name of the vertebrate at the bottom of the square. Cut out the squares. Follow the rules from your teacher to play a matching game with your partner.

 _____	 _____
 _____	 _____
 _____	