

Chapter Resources

Vertebrate Animals

Includes:

Reproducible Student Pages

ASSESSMENT

- ✓ Chapter Tests
- ✓ Chapter Review

HANDS-ON ACTIVITIES

- ✓ Lab Worksheets for each Student Edition Activity
- ✓ Laboratory Activities
- ✓ Foldables—Reading and Study Skills activity sheet

MEETING INDIVIDUAL NEEDS

- ✓ Directed Reading for Content Mastery
- ✓ Directed Reading for Content Mastery in Spanish
- ✓ Reinforcement
- ✓ Enrichment
- ✓ Note-taking Worksheets

TRANSPARENCY ACTIVITIES

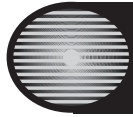
- ✓ Section Focus Transparency Activities
- ✓ Teaching Transparency Activity
- ✓ Assessment Transparency Activity

Teacher Support and Planning

- ✓ Content Outline for Teaching
- ✓ Spanish Resources
- ✓ Teacher Guide and Answers

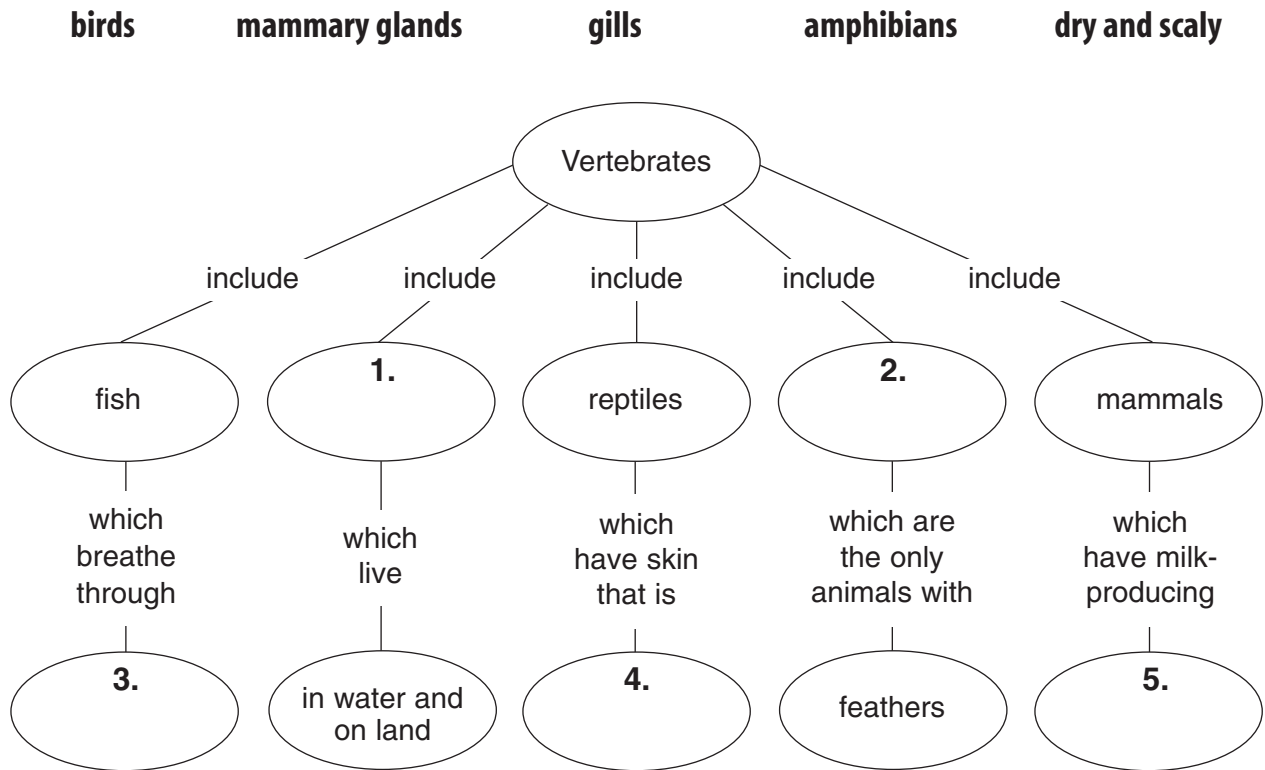


Glencoe



Overview Vertebrate Animals

Directions: Complete the concept map using the terms in the list below.

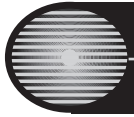


Directions: Write **endothermic** or **ectothermic** to describe each type of vertebrate.

- _____ 6. fish
- _____ 7. bird
- _____ 8. reptile
- _____ 9. mammal
- _____ 10. amphibian

Directions: Write **T** if the statement is true; write **F** if the statement is false.

- _____ 11. All birds can fly.
- _____ 12. Humans are placentals.
- _____ 13. Turtles can breathe under water.
- _____ 14. A mammal's skin tells you if it is an omnivore, herbivore, or carnivore.
- _____ 15. A bird's contour feathers provide an insulating layer to keep it warm.



Directed Reading for
Content Mastery

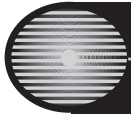
Section 1 ■ Chordate Animals
Section 2 ■ Amphibians and Reptiles

Directions: Draw a line connecting each definition to the correct term.

- | | |
|---|--------------------|
| 1. animals whose body temperature changes as the surrounding temperature changes | chordates |
| 2. have a notochord, a nerve cord, and pharyngeal pouches sometime during their development | endotherms |
| 3. have skeletons made of cartilage, moveable jaws, and rough, sandpaper-like scales | ectotherms |
| 4. fanlike structures for steering, balancing, and moving | fins |
| 5. have skeletons made of bone | bony fish |
| 6. animals with a nearly constant temperature | cartilaginous fish |

Directions: Circle the letter of the term or phrase that correctly completes each sentence below.

7. The series of body changes that occurs during the life cycle of an amphibian is _____.
- metamorphosis
 - estivation
 - respiration
8. Reptiles include _____.
- frogs, toads, and salamanders
 - turtles, lizards, and snakes
 - dogs, cats, and kangaroos
9. Protection for reptile eggs comes from _____.
- a jellylike covering
 - a tough, leathery shell
 - sharp spikes



Directed Reading for
Content Mastery

Section 3 ■ Birds
Section 4 ■ Mammals

Directions: Answer the following questions on the lines provided.

1. What are three functions of birds' feather colors and patterns?

a. _____

b. _____

c. _____

2. Why is preening important for birds?

3. What are some adaptations that allow birds to fly?

Directions: Fill in each blank with a word from the list below.

marsupials
omnivores

monotremes
carnivores

placentals
herbivores

_____ 4. animals that eat plants

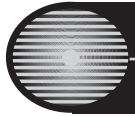
_____ 5. kangaroos, koalas, Tasmanian devils, wallabies, opossums

_____ 6. animals that eat both plants and animals

_____ 7. animals that eat meat

_____ 8. humans, dogs, mice, elephants

_____ 9. duck-billed platypus, echidnas



Directed Reading for
Content Mastery

Key Terms Vertebrate Animals

Directions: Use the following terms to complete the sentences below.

chordates	endotherms	amniotic egg	marsupials
cartilage	down feathers	estivation	monotremes
herbivores	ectotherms	contour feathers	placentals

1. Animals with a notochord are _____.
2. _____ trap and keep warm air next to birds' bodies.
3. Mammals are _____ because they have a constant body temperature.
4. Mammals called _____ only have teeth specialized for eating plants.
5. During _____, amphibians hide underground to find cooler, more humid surroundings.
6. Mammals that only eat meat are called _____.
7. _____ give birds their color and streamlined shape.
8. Some fish have a skeleton made of bone, while other fish have a skeleton made of _____.
9. The _____ allows reptiles to reproduce without water.
10. Amphibians are _____ because their body temperatures change as the surrounding temperatures change.
11. Mammals that lay eggs with tough, leathery shells are called _____.
12. The largest number of mammals belong to a group called _____.
13. Most _____ carry their young in a pouch.

SECTION**1****Reinforcement****Chordate Animals**

Directions: Answer the following questions in the spaces provided.

1. Name the three structures that all chordates have in common.

a. _____

b. _____

c. _____

2. Vertebrates have an internal system of bones called an endoskeleton. What is its purpose?

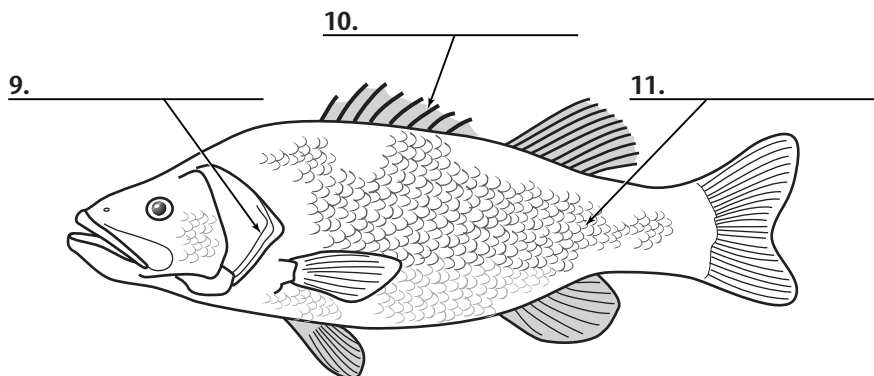
3. To which class of fish do 95 percent of all fish belong?

4. Name and describe the three adaptations that allow fish to live in water. Then label the figure with those terms.

a. _____

b. _____

c. _____



SECTION
2**Reinforcement****Amphibians and Reptiles**

Directions: Answer the following questions using complete sentences.

1. What is the definition of a reptile?

2. How are reptiles related to amphibians?

3. Compare the skin of amphibians and reptiles.

4. What role does an amphibian's skin play in breathing?

5. Compare and contrast hibernation and estivation.

6. What is metamorphosis?

7. What amphibian activities occur on land? In water?

8. Explain the function of each of these structures in reptile eggs.

a. amniotic egg _____

b. a leathery shell _____

c. a yolk _____

SECTION
3

Reinforcement

Birds

Directions: Answer the following questions on the lines provided.

1. Describe the four characteristics of birds.

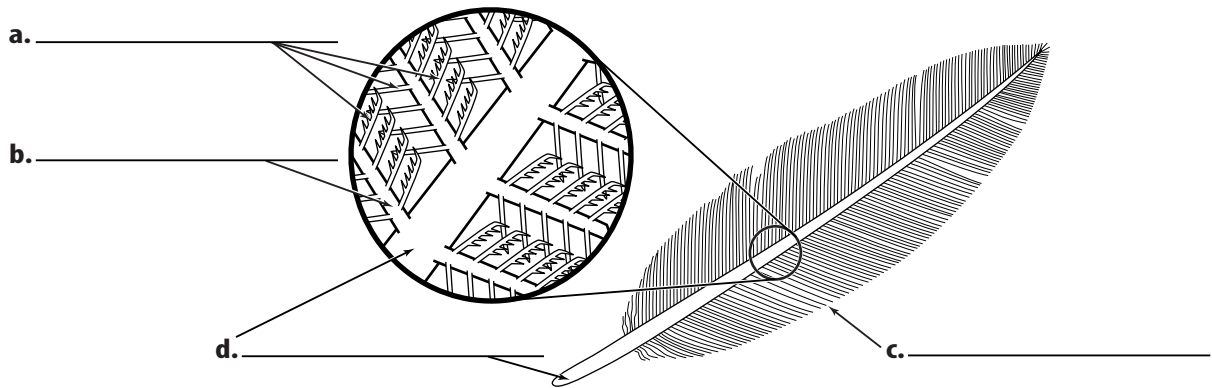
a. _____

b. _____

c. _____

d. _____

2. Label the drawing of a contour feather with the names of its parts.



3. How do the air sacs of birds help make the body lighter?

4. What is the purpose of preening?

5. Compare and contrast contour feathers and down feathers.

SECTION

4

Reinforcement

Mammals

Directions: Answer the following questions on the lines provided.

1. What are some characteristics of mammals?

2. What are some problems facing mammals today?

3. What are the functions of these mammal characteristics?

a. hair or fur _____

b. mammary glands _____

c. complex nervous system _____

d. well-developed lungs _____

4. Define these types of mammals.

a. Carnivores _____

b. Herbivores _____

c. Omnivores _____

Directions: Fill in the table by describing two characteristics of each group of mammals and giving an example.

Group	Characteristic A	Characteristic B	Example
5. Monotremes			
6. Marsupials			
7. Placentals			

SECTION 1

Enrichment

Poisonous Fish

Fish of all sizes, shapes, and colors gracefully swim in a peaceful, underwater habitat—this is a scene that might come to mind when reading or learning about different types of this group of vertebrates. However, don't be fooled by this gentle scene. Many species of fish can deliver powerful toxins that can harm or even kill their predators, including people. Some fish deliver the poison by stinging with pointy spines. Others contain the poison in their flesh, making eating them quite a risky activity.

Lions and Zebras and Turkeys . . . Oh My!

Most poisonous fish live in saltwater habitats. In fact, they make up nearly 5 percent of the different types of tropical marine fish species. In the tropical Indo-Pacific region, more than 300 species of fish have been identified as being poisonous at different times of year. One such fish is the lionfish. This fish is in the scorpion fish family. It has venomous fin spines that cause puncture wounds that are usually not fatal.

Mild Reaction

The toxins of the different poisonous fish are alike but vary in strength. Some may cause mild reactions similar to a bee sting. Such is the case with certain types of freshwater catfish.

Pufferfish Poison

Among the most powerful toxins is that found in the pufferfish, which lives in the waters of the Far East. Eating this fish can cause death within five or six hours. The substance delivered by pufferfish is a nerve toxin called tetradon. In the case of pufferfish poisoning, tetradon causes weakness, tingling in the mouth that spreads throughout the body, paralysis, and the reversal of the sense of touch so that cold feels hot and hot feels cold. More than 60 percent of cases of pufferfish poisoning end in death, although those who survive 24 hours have a good chance of survival.

Regional Differences

In the Caribbean, eating sea bass and snapper can cause poisoning while in other parts of the world, these fish are eaten with no problem. The reasons these fish are poisonous in that particular region are still unknown.

Looks Can Be Deceiving

These fish are just one of the hundreds of examples showing that harmful venom sometimes lurks beneath the surface of peaceful-looking tropical ocean settings.

1. What are two ways some fish can deliver their harmful toxins?

2. Which two types of fish can cause poisoning in the Caribbean but not in other parts of the world?

3. What is the nerve toxin of the pufferfish called?

4. What are two types of poisonous saltwater fish?

SECTION
2

Enrichment

Designing an Experiment: Amphibian Breathing

Amphibians hibernate during the cold winter months, burying themselves in mud or leaves until the temperature rises. They don't eat and they barely move during hibernation. Their bodies slow down. Do you think that their internal body processes also slow down?

One internal amphibian body process you can observe is a frog breathing, because you can watch the movements of a frog's throat as it inhales. To find out how temperature affects breathing, you could count the frog's breaths and relate them to temperature.

With those thoughts in mind, design an experiment that examines the effect of changes in temperature on amphibian body processes. Use the materials listed below when you design your experiment. You can add other materials if you wish. Write the step-by-step procedure of how you would perform your experiment. Then, write a hypothesis stating what you expect the results of the experiment to be. Remember, you don't want to harm the amphibian in any way.

Materials



- | | |
|-------------------------|----------------|
| frog or other amphibian | warm water |
| thermometer | pan |
| glass jar | clock or watch |
| ice | |

Procedure

Hypothesis

Meeting Individual Needs

SECTION 3

Enrichment

Migration of Birds

Many animals, particularly birds, have a remarkable ability to migrate over thousands of miles of land and sea. Yet we know very little about how they do this. Clearly these animals must have special mechanisms of navigation and orientation.

The Atlantic golden plover flies more than 12,000 kilometers from the northernmost part of Canada, its arctic breeding ground, to an area of the southeastern part of South America. Perhaps it is even more extraordinary that the Pacific golden plover finds its way from the western region of Alaska to the Hawaiian and Marquesas islands which are relatively small pieces of land in the vast Pacific Ocean.

“First star on the left.”

After much research, scientists determined that these birds migrate by the Sun and stars. Some species of birds cannot migrate successfully in cloudy weather. However, many other species continue to migrate under clouds and through fog. This posed another problem for scientists.

Internal Clocks

After many experiments, it was shown that birds combine information from two sources to fly in a particular compass direction. These

sources are the Sun or a constellation of stars, and their “internal clocks,” which are related in some way to 24-hour periods. But even this does not explain birds’ ability to migrate on a cloudy day or starless night.

Magnetic Brains

There is much experimental evidence that birds can detect Earth’s magnetic field and orient themselves with it. Very little is known about how birds detect magnetism. However, bits of magnetite, a magnetic iron ore, have been found in the heads of pigeons. It is assumed at present that the magnetite is involved in some way in the pigeon’s “magnetic sense.” Indeed, scientists have upset a pigeon’s flight pattern by attaching a small magnet to the bird. Scientists have recently found that at least some species reset their internal magnetic compasses against the positions of the stars during rest stops. These birds get lost if they do not take enough time at each stop.

More Studies are Needed

Much has been learned about navigation and orientation of birds and other animals. Yet scientists are far from understanding how birds can migrate with such accuracy for great distances year after year.

1. Until fairly recently, how were birds thought to orient themselves on a long migratory flight?

2. What recent discovery helps to explain how birds can fly in a particular compass direction?

3. How does a homing (messenger) pigeon find its way from the coast of France to its cage on the roof of a London apartment house?

SECTION
4

Enrichment

Observations of a Mammal

You will observe characteristics of a mammal in the following activity.

Procedure

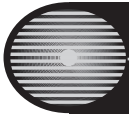
Choose a family pet or some pet you know well in the neighborhood. Make sure the pet is a mammal. Pets might include a dog, a cat, a rabbit, a gerbil, a horse, or a mouse. Observe the mammal, keeping in mind the mammal characteristics that you learned about in your textbook.

Add to your observations by looking in an encyclopedia or another reference book that includes information about your mammal. Complete the table below with your observations and the information you gained by reading about this mammal.

Characteristic	Observation/Information
Animal type	
Scientific classification (kingdom, class, order)	
Outer covering	
Teeth	
Food	
Reproduction (type, mammal classification, gestation period)	
Other characteristics	

1. After observing the mammal's teeth and food choices, would you classify it as a herbivore, a carnivore, or an omnivore? Explain.

2. What characteristics of the mammal you observed seem to make it well suited to living in your home or neighborhood?

**Note-taking
Worksheet****Vertebrate Animals****Section 1 Chordate Animals**

- A. _____—animal with a notochord, a nerve cord, and pharyngeal pouches sometime during its development
1. Internal system of bones called an _____
 2. _____—cold-blooded animals whose body temperature changes as their surrounding temperature changes
 3. _____—warm-blooded animals whose body temperature does not change with changes in their surroundings
- B. _____—ectotherms living in water
1. _____ that exchange carbon dioxide for oxygen
 2. _____ that help steer, balance, and move
 3. _____ that cover and protect skin
- C. Three _____ of fish
1. _____—have a skeleton made of bone; 95% of all fish
 - a. _____—air sac that helps control swimming depth
 - b. External fertilization in reproduction
 2. _____ fish—long, tube-like body without scales; a cartilage skeleton; mouth without a jaw; very few species
 3. _____ fish—cartilage skeletons, movable jaws, rough scales, sharp teeth, usually predators; sharks in this group

Section 2 Amphibians and Reptiles

- A. _____ spend part of their lives on land and part in water.
1. Amphibian adaptations
 - a. _____—inactivity during cold weather
 - b. _____—inactivity during hot, dry weather

Note-taking Worksheet (continued)

2. Characteristics of amphibians

- _____ that support body on land
- _____ that breathe on land; also exchange oxygen and carbon dioxide through the skin
- _____ and _____ adapted to land life
- Long, sticky _____ captures insects for food

3. Amphibian _____

- Hatched from eggs fertilized in water; _____ live in water and breathe through gills
- Land-function structures such as _____ and _____ develop for _____ life

B. _____—ectothermic animals that generally live their whole lives on land

1. Reptile types—body plans _____

- Some, such as turtles, use a hard _____ for protection.
- Some, such as alligators or crocodiles, live in or near _____.
- Some, such as lizards and snakes, use their tongues to _____ their environment

2. Reptile _____

- Thick, dry skin covered with _____ protects and reduces water loss.
- Breathe through _____
- Internal fertilization produces _____ that nourish and protect the young until they hatch, fully developed

Section 3 Birds

A. _____—endothermic vertebrates that have two wings, two legs, a bill or beak, feathers, and lay eggs

B. Adaptations for _____

- Strong, almost hollow _____
- High-energy _____
- Large, efficient _____
- Lungs with _____ for efficiency and light weight
- _____ shape, movement, and surface area to enable flight

Note-taking Worksheet (continued)**C.** _____ functions

1. _____—give streamlined shape and coloring
 - a. _____—parallel strands off the main shaft
 - b. Help bird _____ or swim
 - c. Attract _____ or _____ from predators
2. _____—insulating layer of fluffy feathers under contour feathers
3. Feather care—_____ cleans and reorganizes feathers and may add conditioning _____

Section 4 Mammals**A.** _____—endothermic vertebrates with mammary glands and hair

1. _____—produce milk that is used to nourish young
2. Specialized _____
 - a. _____—plant-eating animals with incisors that cut and flat molars that grind
 - b. _____—meat eaters with sharp canines that tear flesh
 - c. _____—eat both plants and animals using a variety of teeth
3. Body _____
 - a. Well developed _____ with millions of alveoli
 - b. Large _____ and complex nervous system that allows them to learn and remember
 - c. _____ fertilization

Note-taking Worksheet (continued)

B. _____ types

1. _____ lay eggs and lack nipples on mammary glands.
2. _____ give birth to immature young that finish developing in a pouch.
3. _____ develop from embryos connected to a placenta by an umbilical cord.
 - a. Placenta provides _____ and oxygen to embryo and removes the embryo's _____.
 - b. Time of development in uterus is called _____.

C. Mammals _____

1. More than 4,000 _____ exist.
2. Found on every _____ and climate
3. Have a role in maintaining environmental _____