

Chapter 12 Fishes, Amphibians, and Reptiles

Study Guide

1. Evolution of Vertebrates

a. The **Chordate** Phylum

- i. **Notochord**
- ii. **Cartilage**
- iii. *What characteristics do all chordates share?*

b. The Backbone and Endoskeleton

- i. **Vertebrae**
- ii. *What functions does a vertebrate's skeleton perform?*

c. Maintaining Body Temperature

- i. **Ectotherm**
- ii. **Endotherm**

d. Vertebrate History in Rocks

- i. **Fossil**
- ii. **Sedimentary Rock**
- iii. *What are two ways in which fossils form?*

2. Fishes

a. Obtaining Oxygen

b. Moving and Feeding

- i. *How does having fins help a fish?*

c. How Fishes Reproduce

d. Fishes without Jaws

e. Cartilaginous Fishes

- i. A Shark's Body
- ii. Always on the Move

1. *Why must sharks always keep water moving over their gills?*

f. Bony Fishes

i. **Swim Bladders** and Buoyancy

1. **Buoyant Force**

ii. Diversity of Bony Fishes

1. *If a pencil floats, how does the buoyant force on the pencil compare to the pencil's weight?*

g. Food for People

3. Amphibians

a. Gills to Lungs

b. Amphibian Circulation

i. **Atria**

ii. **Ventricle**

iii. *Compare the functions of the atria and ventricle.*

c. Reproduction and Development

d. Getting Around on Land

e. Frogs and Toads

i. *How can you tell a frog from a toad?*

f. Salamanders

g. Amphibians in Danger

i. **Habitat**

4. Reptiles

a. Protection from Drying Out

i. An Egg With a Shell

ii. Skin and Kidneys

1. **Urine**

2. *List two functions of a reptile's skin.*

b. Obtaining Oxygen from the Air

c. Lizards

d. Snakes

i. Snakes on the Move

ii. How Snakes Feed

iii. *How do snakes move?*

e. Turtles

f. Alligators and Crocodiles

i. *How are alligators and crocodiles adapted for catching prey?*

g. Extinct Reptiles – The Dinosaurs

SECTION 12-1 REVIEW AND REINFORCE

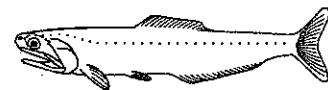
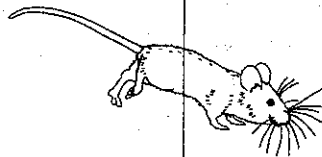
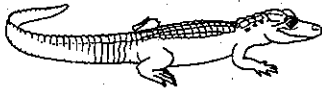
Evolution of Vertebrates

◆ Understanding Main Ideas

Answer the following questions on a separate sheet of paper.

1. What three characteristics do all chordates share?
2. What is a vertebrate?
3. What are three functions of an endoskeleton?
4. In what order do scientists think the five main groups of vertebrates—mammals, reptiles, fish, birds, and amphibians—developed? List the earliest group first.

State whether the following animals are ectotherms or endotherms. Write your answer on the line provided.



5. _____ 6. _____ 7. _____

◆ Building Vocabulary

From the list below, choose the term that best completes each sentence.

- | | | |
|-----------|-----------|-----------|
| chordate | notochord | cartilage |
| ectotherm | endotherm | vertebra |

8. The body of a(n) _____ doesn't produce much internal heat. Its body temperature changes depending on the temperature of its environment.
9. The body of a(n) _____ controls and regulates its temperature. Often its body temperature is higher than the temperature of its environment.
10. Some chordates keep the _____ all their lives, whereas others have it only as larvae.
11. One of the bones of the spinal column is called a(n) _____.
12. A notochord is made of _____, the same material that the human ear is made of.
13. Vertebrates are a subgroup of the phylum known as the _____ phylum.

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SECTION 12-2

REVIEW AND REINFORCE

Fishes

◆ Understanding Main Ideas

Answer the following questions on a separate sheet of paper.

1. What function do gills perform?
2. How is the skeleton of a shark similar to the skeleton of a jawless fish?
3. What are the three main groups of fishes?
4. What kind of fertilization do most fish have?
5. What is the function of a swim bladder?
6. What is one way that people are trying to alleviate the problem of overfishing?

Determine whether each statement is true or false. If it is true, write true. If it is false, change the underlined word or words to make the statement true.

- _____ 7. Sharks are bony fishes.
- _____ 8. Most fishes are endotherms.
- _____ 9. Fishes spend most of their time hunting for food or feeding.
- _____ 10. Most species of fishes belong to the bony fishes group.

◆ Building Vocabulary

Fill in the blank to complete each statement.

11. Most bony fishes have a gas-filled organ called a(n) _____, which helps stabilize the fish at different levels in the water.
12. A balloonfish that swallows air will float because it weighs less than the _____ that water exerts upward against it.

SECTION 12-3 REVIEW AND REINFORCE

Amphibians

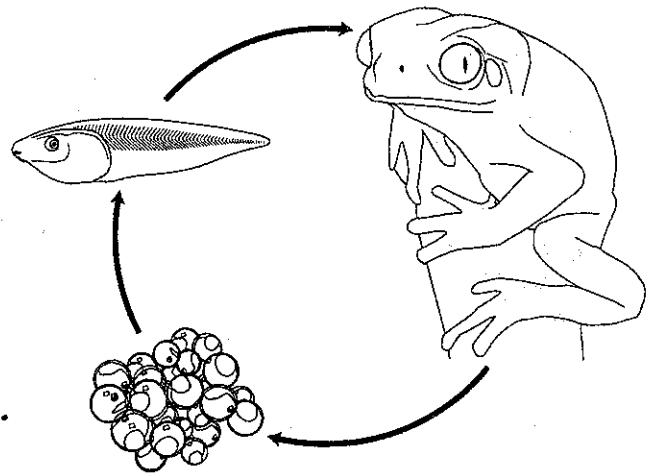
◆ Understanding Main Ideas

Mark the diagram as directed.

1. Correctly label each stage of an amphibian's life—eggs, larva, adult.
2. Draw an X on the stage during which the amphibian breathes with gills.
3. Draw a circle around the stage during which the amphibian breathes with lungs.

Answer the following questions on the back of this sheet or on a separate sheet of paper.

4. What are the two major groups of amphibians? Describe the characteristics of each group.
5. Identify two factors that are probably responsible for the decline in amphibian populations.
6. What are two adaptations amphibians have for moving on land?



◆ Building Vocabulary

Answer the following questions in the spaces provided.

7. What are the main characteristics of amphibians?

8. What is an animal's habitat?

9. In the amphibian heart, what part is the atrium and what is its function?

10. In the amphibian heart, what part is the ventricle and what is its function?

SECTION 12-4 REVIEW AND REINFORCE

Reptiles

◆ Understanding Main Ideas

Write the letter of the word or phrase that completes each statement.

- | | |
|---|---------------------|
| 1. Three adaptations that reptiles have for conserving water are _____, _____, and _____. | a. lungs |
| 2. The part of the egg that provides the reptile embryo with food is called the _____. | b. eyelids |
| 3. Snakes have specialized _____ that enable them to eat large prey. | c. eggs with shells |
| 4. All reptiles breathe with _____. | d. jaws |
| 5. Snakes look a lot like lizards, but snakes don't have _____ or _____. | e. external ears |
| | f. kidneys |
| | g. yolk |
| | h. thick skin |

◆ Building Vocabulary

Write a definition for each of the following terms.

6. reptile

7. urine

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Name: _____

Class: _____

Choose the letter of the correct answer.

- Most adult amphibians can obtain oxygen through
[A] lungs only. [B] lungs and thin, moist skin.
[C] gills and lungs. [D] gills and thin, moist skin.
- Amphibians are especially sensitive to changes in the environment because
[A] their skin is very thin. [B] few amphibians have camouflage.
[C] their eggs are tough and leathery. [D] they do well only in sunny areas.
- When the temperature of the environment changes, the body temperature of a reptile
[A] changes. [B] stays the same. [C] always decreases. [D] always increases.
- What is one way in which a reptile's egg is adapted to survive on land?
[A] The egg has membranes that help keep the embryo moist.
[B] The embryo has an air tube to get oxygen directly from the air.
[C] The egg has a hard, rigid shell.
[D] The embryo's skin keeps water in the egg.
- Why is "fish farming" helpful in dealing with the problem of decreasing numbers of fish?
[A] It is easier to sell fish from fish farms than to sell fish that have been caught.
[B] It reduces the demand for fish caught in rivers and oceans.
[C] It reduces interest in sport fishing.
[D] Fish raised in fish farms taste better than fish caught in rivers and oceans.
- What type of fish is a lamprey?
[A] a jawless fish [B] a cartilaginous fish [C] a bony fish [D] an endothermic fish
- Which of the following fish has a skeleton made of hard bone?
[A] a ray [B] a goldfish [C] a shark [D] a hagfish
- What is the function of a swim bladder?
[A] to eliminate excess oxygen [B] to help digest food
[C] to process body wastes [D] to control buoyancy

Choose the letter of the correct answer.

9. What has drastically reduced populations of certain kinds of fish that people use for food?
[A] disease [B] habitat destruction
[C] overfishing [D] damage to the fishes reproductive organs
10. Fish take in oxygen through their [A] scales. [B] gills. [C] vertebrae. [D] fins.
11. Which of these organs help a reptile keep water in its body?
[A] skin and kidneys [B] heart and kidneys [C] heart and lungs [D] skin and heart
12. The toe pads of tree frogs are an adaptation that help the frogs
[A] defend themselves from predators. [B] reproduce.
[C] capture prey. [D] move from twig to twig.
13. One major difference between lizards and snakes is that lizards
[A] can live in very cold climates. [B] are herbivores.
[C] can regenerate damaged limbs. [D] have legs.
14. The latest group of vertebrates to arise was probably the
[A] reptiles. [B] fishes. [C] birds. [D] mammals.

Fill in the word or phrase that best completes the statement(s).

15. Alligators and crocodiles use their _____ to swim through the water.
16. Sharks, rays, and skates have skeletons made of _____.
17. At some point in their lives, all chordates have _____ in their throat area.
18. Tiny holes in a reptile's shell allow the embryo to get rid of the waste called _____.
19. Most bony fishes have an organ called a(n) _____, which allows a fish to stabilize its body at different depths.

If the statement is true, write true. If it is false, change the underlined word or words to make the statement true.

20. Reptiles have moist, tough skins covered with scales.

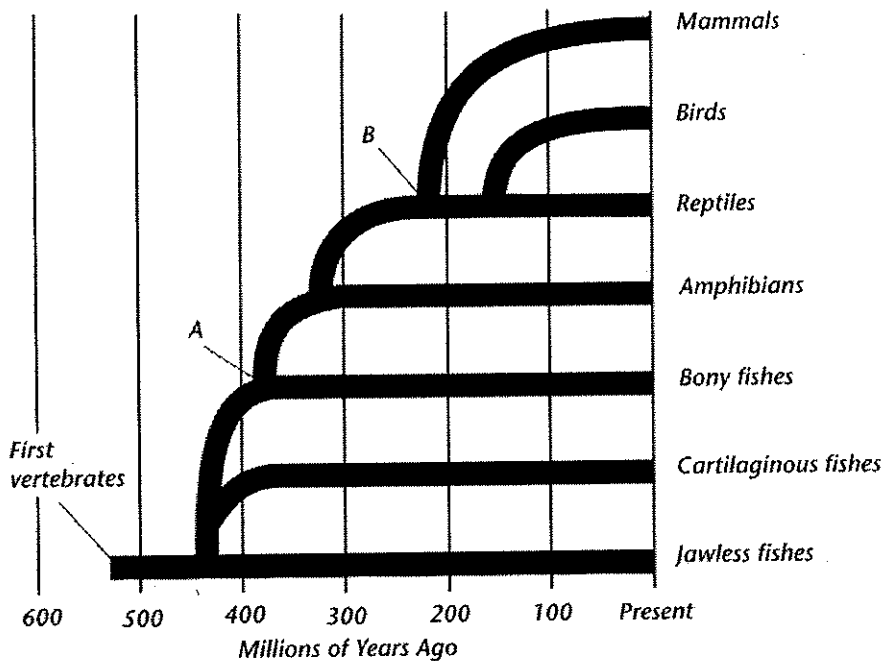
If the statement is true, write true. If it is false, change the underlined word or words to make the statement true.

21. Amphibians are best adapted to living in dry, sunny environments.

22. The hearts of most amphibians have two upper chambers called ventricles, which receive blood.

Use the diagram to answer the question(s).

Evolution of Vertebrates



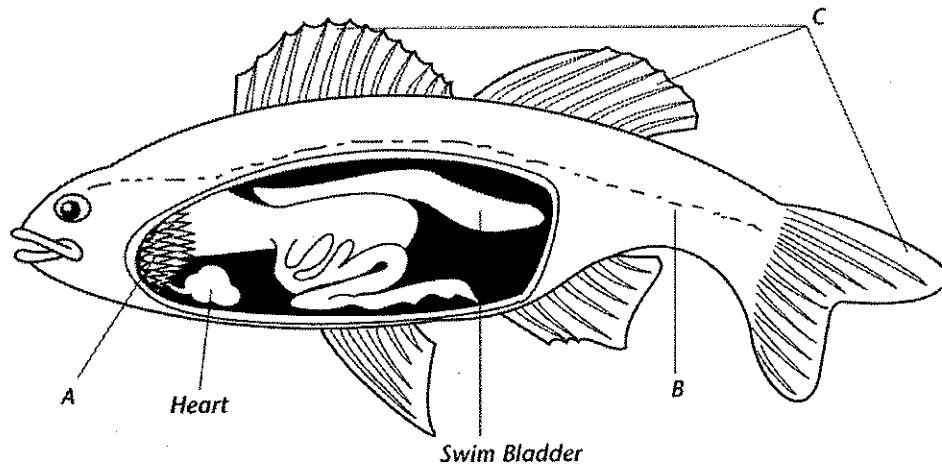
23. According to the diagram, when did the first vertebrates appear?

24. According to the diagram, when did the first cartilaginous fishes appear?

25. B represents a vertebrate that evolved later than vertebrate A. Which groups of vertebrates evolved from vertebrate B?

Use the diagram to answer the question(s).

Characteristics of a Fish



26. Identify the structures labeled C and describe their function.

Write an answer to the following question(s).

27. Identify two ways in which snakes and lizards are alike. Then identify two ways in which they are different from one another.
28. Explain the function of each of the three membranes of the eggs of reptiles.
29. Compare and contrast the mouths and skeletons of the three major groups of fish.
30. Describe the functions of a vertebrate's skeleton.