

Chapter 31 Study Guide

Study Tip

Students can construct a Venn diagram to show characteristics and adaptations that birds and reptiles have in common, and those that are specific to each.

Thinking Visually

1. Ectotherms
2. Uric acid
- 3., 4. Crocodilians; Turtles and Tortoises

Chapter 31 Assessment

Reviewing Content

1. c 5. b 9. c
2. a 6. b 10. c
3. b 7. d
4. c 8. b

Understanding Concepts

11. The skin is shed periodically as a reptile increases in size.

12. Earth's climate became cooler and less humid. Since reptiles were better adapted than amphibians to survive in this drier climate, a great adaptive radiation of reptiles began.

13. One hypothesis asserts that at the end of the Cretaceous Period, a string of massive volcanic eruptions, lava flows, the dropping of sea level, and a huge asteroid or comet colliding into the Yucatán Peninsula in Mexico occurred. The asteroid or comet collision produced enormous dust clouds and major forest fires. Within a few million years of these events, dinosaurs, along with many other animal and plant groups, disappeared.

14. Interactions with the environment help the animal control its body temperature. When reptiles begin to cool down, they may move toward warmth, such as sunlight. When their bodies become hot, reptiles move to a cooler environment, such as shade.

Chapter 31 Study Guide

31-1 Reptiles

Key Concepts

- A reptile is a vertebrate that has scaly skin, lungs, and eggs with several membranes.
- Well-developed lungs; a double-loop circulatory system; an efficient excretory system; strong limbs; internal fertilization; and shelled, terrestrial eggs are the main adaptations that have contributed to the success of reptiles on land.
- The four surviving groups of reptiles are lizards and snakes, crocodilians, turtles and tortoises, and the tuatara.

Vocabulary

ectotherm, p. 800
amniotic egg, p. 802
carapace, p. 805
plastron, p. 805

31-2 Birds

Key Concepts

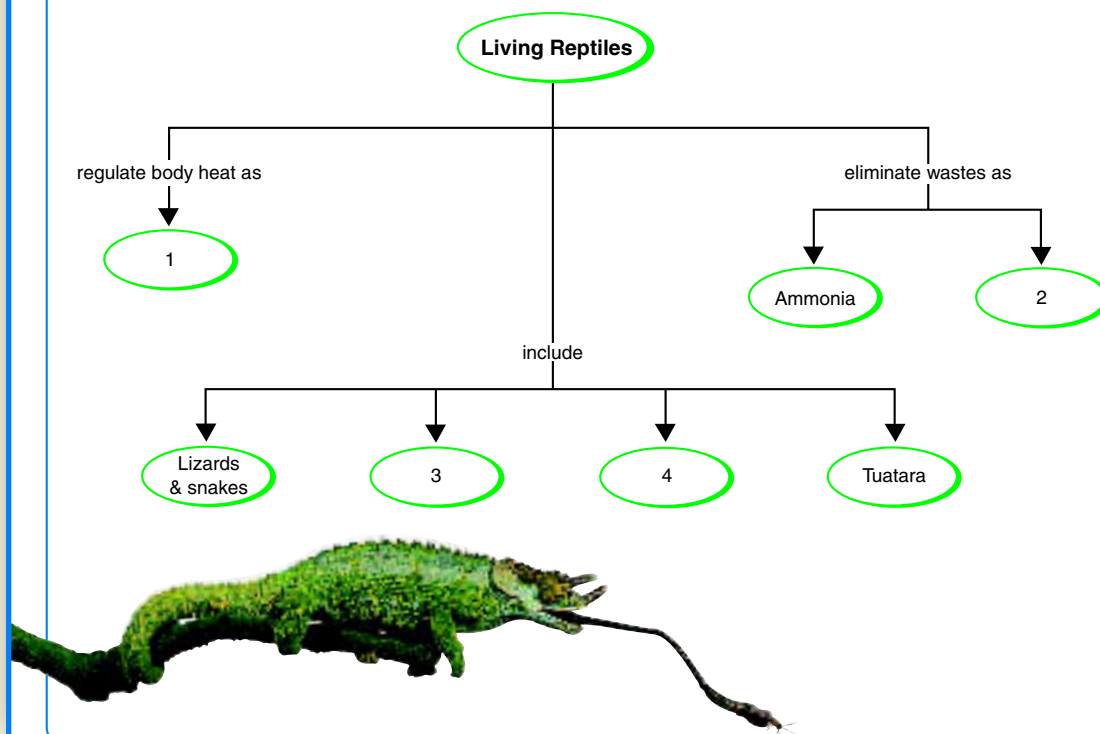
- Birds are reptilelike animals that maintain a constant internal body temperature. They have an outer covering of feathers; two legs that are covered with scales and are used for walking or perching; and front limbs modified into wings.
- Birds have a number of adaptations that enable them to fly. These adaptations include highly efficient digestive, respiratory, and circulatory systems; aerodynamic feathers and wings; strong, lightweight bones; and strong chest muscles.

Vocabulary

feather, p. 806
endotherm, p. 808
crop, p. 809
gizzard, p. 809
air sac, p. 810

Thinking Visually

Using information from this chapter, complete the following concept map:



CHAPTER RESOURCES

Print:

- **Teaching Resources**, Chapter Vocabulary Review, Graphic Organizers
- **Chapter Tests: Levels A and B**, Chapter 31 Test

Technology:

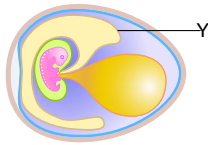
- **Computer Test Bank**, Chapter 31 Test
- **iText**, Chapter 31 Assessment

Chapter 31 Assessment

Reviewing Content

Choose the letter that best answers the question or completes the statement.

- Which adaptation is NOT characteristic of reptiles?
 - scaly skin
 - amniotic egg
 - gills
 - lungs
- Dinosaurs became extinct at the end of the
 - Cretaceous Period.
 - Triassic Period.
 - Carboniferous Period.
 - Permian Period.
- An animal that relies on interaction with the environment to help it control body temperature is known as a(an)
 - endotherm.
 - ectotherm.
 - flightless bird.
 - endoderm.
- Which reptiles have some type of shell covering their bodies?
 - lizards and snakes
 - crocodilians
 - turtles and tortoises
 - tuatara
- In the diagram below, the membrane labeled Y represents what part of the amniotic egg?



- amnion
 - chorion
 - allantois
 - yolk sac
- The single most important characteristic that separates birds from other living animals is the presence of
 - hollow bones.
 - feathers.
 - two legs.
 - wings.
 - Which of the following bird structures are especially adapted to support flight?
 - cloacas
 - gizzards
 - bills
 - chest muscles
 - The muscular part of a bird's stomach that contains gravel, which crushes food, is the
 - cloaca.
 - gizzard.
 - crop.
 - air sac.
 - Birds excrete nitrogenous wastes mostly in the form of
 - urine.
 - ammonia.
 - uric acid.
 - urea.

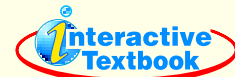
Interactive textbook with assessment at PHSchool.com



- Unlike other vertebrates, birds have respiratory systems that
 - take in oxygen and release carbon dioxide.
 - excrete nitrogenous wastes.
 - maintain a one-way flow of air.
 - have modified scales.

Understanding Concepts

- As a reptile grows, what happens to its skin?
- What climate conditions prevailed at the end of the Carboniferous Period? How did these conditions affect the evolution of reptiles?
- What conditions may have caused the mass extinction of the dinosaurs?
- In what way do interactions with the environment affect the body temperatures of reptiles?
- How is the process of respiration in reptiles adapted to life on land?
- Why is the amniotic egg considered to be one of the most important adaptations to life on land?
- Describe the structure of a turtle's shell.
- How do crocodilians care for their young?
- If a bird has a short, thick bill, what does it probably feed on?
- How does a pigeon's crop help enable it to care for young?
- What are air sacs? How do air sacs help ensure that a bird has an adequate supply of oxygen?
- Describe how a bird's skeletal system is adapted in ways that enable flight.
- Describe the structure of bird eggs and explain what usually happens to the eggs after they are laid.
- What adaptation enables birds to live in environments that are colder than those typically supporting reptiles?
- What functions do the cerebrum and cerebellum control in birds?
- Name three groups of birds, and describe some of their characteristics.
- How do migrating birds find their way?



If your class subscribes to the iText, your students can go online to access an interactive version of the Student Edition and a self-test.

(Continued from page 816)

- Most reptiles have two lungs composed of spongy tissue that provides a large area for gas exchange. Many reptiles have muscles around their ribs to help expand and collapse the chest cavity.
- The shells and membranes of amniotic eggs create a protected environment in which the embryos can develop without drying out.
- A turtle's shell is built into the skeleton. The carapace is dorsal, and the plastron is ventral.
- Mothers guard their eggs from predators. They carry hatchlings to a nursery area and watch over them.
- Seeds
- During nesting season, the crop produces a substance high in protein and fat. Parent birds regurgitate this substance and feed it to their young.
- Air sacs are part of the respiratory system that receive inhaled air and direct it through the lungs in an efficient, one-way flow.
- Fused bones provide sturdy attachments for muscles. Cross-bracing and air spaces in the bones make them strong and lightweight.
- Bird eggs are amniotic eggs, with membranes that include the amnion, chorion, allantois, and yolk sac. They have hard outer shells. Most birds incubate their eggs until they hatch.
- Unlike reptiles, birds are endothermic. They also have feathers, which conserve heat.
- The cerebrum controls such behaviors as flying, nest building, caring for young, courtship, and mating. The cerebellum coordinates movement.
- Possible answers include bird groups described in Figure 31-19.
- Migrating birds navigate by using one or more of the following guides: stars and other celestial bodies; landmarks; Earth's magnetic field.



HOMEWORK GUIDE

Section:	Questions:
Section 31-1	1-5, 11-18, 30, 31, 37, 38
Section 31-2	6-10, 19-29, 32-36

Critical Thinking

28. Sample hypothesis: *Archaeopteryx* used its clawed wings to glide down from trees to catch insects.
29. Sample questions: Which birds use more energy for flight? What foods are most available in each bird's habitat? Which birds are more active?
30. The snake might have moved from a cooler location to a warmer one, or the air temperature might have increased during the course of the day in a single location.
31. You would expect to find more reptiles on the tropical island, because ectotherms are more common in warmer climates.
32. The long legs of wetland birds enable the birds to wade out into the water in search of food.
33. The description closely fits that of a bird (or bat). Unlike reptiles, amphibians, and fish, birds are endothermic. The presence of modified front limbs, or wings, is a characteristic of birds.
34. The presence of a great amount of myoglobin in the chest muscles of ducks would indicate that they use these muscles for a great deal of flying. Less myoglobin in the chest muscles of chickens would indicate that these chest muscles are not used as much as those of ducks.
35. Embryos develop within amniotic eggs; adults excrete uric acid wastes; bones that support limbs are similar. Similarities indicate that these animals evolved from an earlier common ancestor.
36. Experimental plans might include repeated trials of removing a young bird from its parents and observing to which parents it returns.
37. Each student should choose a scale and use the scale to construct the diagrams. Diagrams should also include a title and a key.
38. Answers should reflect an understanding of the differences in form and function of reptiles and amphibians. These may include differences in feeding, respiration, circulation, excretion, response, and movement.

Critical Thinking

28. **Formulating Hypotheses** From the small size of its sternum, or breastbone, scientists infer that *Archaeopteryx* was a poor flier. Propose a hypothesis to explain how *Archaeopteryx* might have used its wings.
29. **Asking Questions** Hummingbirds eat high-energy foods, such as nectar and fruit. Ducks eat foods that store less energy, such as grass and leaves. What are some related questions you could investigate to discover more about the birds' diets and energy needs?
30. **Drawing Conclusions** The body temperature of a snake was monitored every half hour for two hours. The temperature readings were 30°C, 32°C, 38°C, 39°C, 39°C. Suggest possible conditions that might explain these changes.
31. **Predicting** Imagine that you plan a visit to a warm tropical island followed by a visit to a much cooler island. In which of these places would you expect to find more reptiles? Explain your prediction.
32. **Inferring** Some wetland birds, such as storks and flamingos, have long legs. How might this adaptation help these birds obtain food?
33. **Classifying** You are told that an animal is endothermic, has two legs, and modified front limbs. It also has a four-chambered heart and two separate circulatory loops. What kind of an animal is it? Explain.
34. **Inferring** The muscles that a bird uses most often contain the greatest amount of a protein called myoglobin. The chest muscles of ducks contain more myoglobin than the chest muscles of chickens. What can you infer about the flight of these two birds?
35. **Inferring** Identify anatomical, physiological, and embryological characteristics shared by reptiles and birds. Explain how evolutionary biologists use these similarities as evidence that may indicate change in species.
36. **Designing Experiments** During breeding season, many species of sea birds nest in large colonies. At any one time, you can hear the cries of many birds in a colony. Design an experiment to determine whether young sea birds can distinguish the calls of their parents from those of other members of the colony.

37. **Using Tables and Graphs** Look at the information in the chart below. Using the length of each snake, construct scaled diagrams on graph paper. Develop a measurement scale (for example, 1 grid square = 2 cm). Include a key to your scale. Color each snake according to its markings.

Snake Descriptions		
Snake	Length (cm)	Markings
Western coral snake	45	Black, yellow, and red rings successively from head to tail
Patch-nosed snake	92	Yellow and brown stripe down the back

38. **Connecting Concepts** Recall what you learned about amphibians in the previous chapter. Make a table that shows how amphibians and reptiles are adapted for life in different environments.

Writing in Science

Describe the structure of down feathers and contour feathers. Explain how the structure of each type of feather is related to its function. (*Hint:* Notice that the assignment has two instructions, *describe* and *explain*. When you describe something, you tell how it looks—or sounds, tastes, smells, or feels. When you explain something, you make it understandable to your audience.)

Performance-Based Assessment

In Your Community Take time to look at some birds that live in your area. If necessary, use a field guide to identify them. Write descriptions of traits you observe, such as different kinds of feathers, bills, and feet. Based on your observations, what do the birds eat? What types of habitats do they prefer?

Go Online
PHSchool.com

For: An interactive self-test
Visit: PHSchool.com
Web Code: cba-9310