

# CHAPTER REVIEW

## CONTENT REVIEW

### Multiple Choice

Choose the letter of the answer that best completes each statement.

- Sharks can detect a drop of blood in a large pool of water using their
  - lateral lines.
  - pyloric caecae.
  - optic lobes.
  - chemoreceptors.
- Animals in which the young are nourished by the mother's body as they develop are
  - ovoviviparous.
  - oviparous.
  - viviparous.
  - externally fertilized.
- At the end of the large intestine of a frog is a muscular cavity called the
  - cloaca.
  - pancreas.
  - gall bladder.
  - colon.
- In most aquatic vertebrates, the notochord is replaced during development by
  - pharyngeal gills.
  - fins.
  - a vertebral column.
  - cartilage.
- Bony fishes make up the class
  - Osteichthyes.
  - Chondrichthyes.
  - Chordata.
  - Latimeria.
- An adult amphibian's heart typically has
  - one chamber.
  - two chambers.
  - three chambers.
  - four chambers.
- Information from a fish's eyes is processed by the part of the brain called the
  - olfactory bulbs.
  - optic lobes.
  - cerebrum.
  - cerebellum.
- Which of the following statements about excretion in a freshwater fish is true?
  - The kidneys remove salt.
  - Water is lost from the gills by osmosis.
  - Wastes are excreted as urea.
  - The urine is dilute.

### True or False

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.

- Members of the class Chondrichthyes are also known as jawless fishes.
- Amphibians are considered to be the most primitive living vertebrates.
- The cerebrum in the brain of a fish controls many internal organs and maintains balance.
- Tadpoles are typically filter feeders or carnivores.
- Viviparous animals lay eggs.
- Adult amphibians are typically herbivores.
- Olfactory bulbs are used to detect motion in the water.
- The coelacanth is a ray-finned fish.

### Word Relationships

In each of the following sets of terms, three of the terms are related. One term does not belong. Determine the characteristic common to three of the terms and then identify the term that does not belong.

- pelvic fin, girdle, cloaca, pectoral fin
- atrium, glottis, bulbus cordis, aortic arch
- lamprey, shark, salamander, salmon
- pyloric caeca, olfactory bulbs, cerebrum, medulla
- catfish, electricity, shark, bullfrog

## CONCEPT MASTERY

Use your understanding of the concepts developed in the chapter to answer each of the following in a brief paragraph.

1. Compare double-loop and single-loop circulatory systems.
2. Pacific salmon die soon after spawning (releasing reproductive cells into the water). Certain catfish incubate their eggs and young in their mouth. Female porbeagle sharks produce infertile eggs that are eaten by the young developing inside their body. Identify each of these fishes as oviparous, viviparous, or ovoviviparous. Which of these fishes probably produces the most offspring in its lifetime? Explain.
3. Give the common name for each of the four living classes of fishes. Briefly describe a specific example of each class.
4. Explain how a tadpole's digestive, respiratory, and circulatory systems must be modified when it undergoes metamorphosis.
5. Some fishes, such as salmon, live in both fresh and salt water. Explain how the excretory systems of such fishes must be adapted to cope with this kind of lifestyle.

## CRITICAL AND CREATIVE THINKING

Discuss each of the following in a brief paragraph.

1. **Making inferences** Members of the amphibian order Apoda are typically blind, wormlike, brightly colored, and viviparous. They have two rows of needlelike inward-curving teeth on the upper jaw and one or two rows on the lower. They do not have gills. The head is shaped like a spade; the bones of the skull are thick and sturdy.
  - a. Where would you expect to find apodans?
  - b. What do apodans probably eat? Would you expect their intestine to be long or short? Explain.
  - c. Describe the processes of fertilization and embryo development in apodans. How are the ways apodans reproduce an adaptation to their environment?
  - d. What other inferences can you make about the habits of apodans? Explain.
2. **Relating concepts** When threatened, a certain harmless salamander stands on tiptoe, touches the tip of its tail to the top of its head to display a bright red underside, and remains perfectly still. Explain this behavior.
3. **Relating cause and effect** Certain deep-sea fishes "explode" if they are rapidly brought up from the depths at which they usually live. Using your knowledge of fish anatomy, explain why the fishes explode. (*Hint: Pressure increases one atmosphere for every 10 meters of sea water.*)
4. **Applying concepts** Explain why even the best-camouflaged prey cannot escape detection by a predator that can sense electricity.
5. **Relating concepts** A scuba diver notices that the surface of the water overhead seems light in color, whereas the water below seems quite dark. How might this observation relate to the fact that most fish have countershading (they are dark-colored on the dorsal side and light-colored on the ventral side)?
6. **Using the writing process** Humans depend mostly on vision. Sharks depend mostly on smell and electric sense. Describe a place you know as a shark might sense it.