

ANIMAL ADAPTATIONS

Name _____

Section 17.1 Invertebrates

In your textbook, read about sponges, cnidarians, body symmetry, and flatworms.

Circle the letter of the choice that best completes the statement.

- The least complex invertebrate is a
 - cnidarian.
 - sponge.
 - flatworm.
 - roundworm.
- A sponge has
 - tissues but no organs or systems.
 - organs but no tissues or systems.
 - systems but no tissues or organs.
 - no tissues, organs, or systems.
- Sponges reproduce
 - only sexually.
 - both sexually and asexually.
 - only asexually.
 - neither sexually nor asexually.
- Genetic variability is a product of
 - sexual reproduction.
 - both asexual and sexual reproduction.
 - asexual reproduction.
 - neither asexual nor sexual reproduction.
- In cnidarians, the two cell layers of sponges have evolved into
 - tissues.
 - systems.
 - organs.
 - tissues, organs, and systems.
- An individual cnidarian produces
 - eggs but not sperm.
 - neither sperm nor eggs.
 - sperm but not eggs.
 - both sperm and eggs.
- A cnidarian has a body structure that is
 - asymmetrical.
 - bilaterally symmetrical.
 - radially symmetrical.
 - like that of the sponge.
- One way in which flatworms differ from cnidarians is that flatworms have
 - one tissue layer.
 - three tissue layers.
 - two tissue layers.
 - four tissue layers.
- Flatworms differ from both sponges and cnidarians in that flatworms possess
 - cells.
 - a mouth through which food enters the body.
 - tissues.
 - organs and organ systems.

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Section 17.2 Divergence of Animal Phyla

In your textbook, read about roundworms, patterns of development, segmented worms, and mollusks.

Answer the following questions.

1. How do the body openings of roundworms differ from those of cnidarians and flatworms?
2. In what ways do the reproductive processes of roundworms differ from those of flatworms?
3. Complex organ systems begin to make their appearance in roundworms. What structures and processes permit this to happen?
4. What organ systems are found in segmented worms?
5. Certain mollusks, such as clams, possess an organ of locomotion that when modified becomes both an organ of movement and food getting in the squid and octopus. What is the organ in the clam and what structures does it become in the squid and octopus?
6. What led scientists to hypothesize that segmented worms and mollusks evolved from a common ancestor?
7. What kinds of behavior have prompted scientists to assume that the squid and octopus are intelligent animals?

Section 17.2 Divergence of Animal Phyla continued

In your textbook, read about arthropods.

Insects comprise one class of the arthropod phylum. Examine the drawing of a typical insect, in this case, a grasshopper. Then write the letter(s) ' from the drawing that refer to the parts described in each statement below.

8. These are body segments. _____

9. These are appendages. _____

10. These are sensory organs. _____

11. These appendages have more than one joint. _____

12. These sense sounds, odors, tastes, and pressure (touch). _____

13. These sense light. _____

14. These are organs of locomotion. _____

15. Unlike other arthropods, insects have six of these. _____

16. Unlike segmented worms, in arthropods, these are fused. _____

17. Peripatus is like an arthropod in that it has structures similar to these. _____

18. These have multiple lenses or facets. _____

19. In the grasshopper, this segment holds most of the sensory organs. _____

20. In insects, legs are attached to this segment. _____

One of the unique characteristics of an arthropod is an exoskeleton. For each of the following statements about the exoskeleton, write true or false.

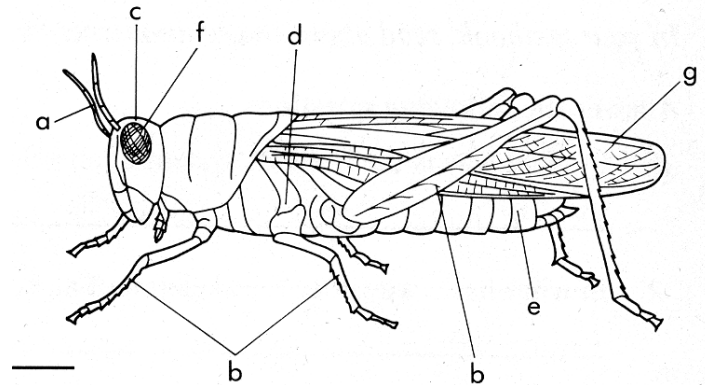
_____ 21. An exoskeleton consists of a soft outer covering.

_____ 22. An exoskeleton provides support for tissues and organs.

_____ 23. An exoskeleton makes arthropods vulnerable to predators.

_____ 24. An exoskeleton increases loss of water from the body.

_____ 25. Muscles of appendages are attached to the exoskeleton.



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Section 17.3 Echinoderms and Chordates

In your textbook, read about the echinoderms, hemichordates, and chordates.

Answer the following questions.

1. In what way is the nervous system of an echinoderm *not* advanced?
2. In what basic way does the skeleton of an echinoderm differ from that of an arthropod?
3. Although most echinoderms reproduce sexually, some reproduce asexually. Describe such a process in echinoderms.
4. Hemichordates appear to be animals intermediate in complexity between echinoderms and chordates. What characteristic do hemichordates share with echinoderms?
5. What characteristics link hemichordates to chordates?
6. What do all chordates have in common?
7. What is the major difference between the organisms in the subphyla to which tunicates and lancelets belong and the subphylum to which fish, amphibians, reptiles, birds, and mammals belong?
8. In human beings, what is the protective function of the vertebrae?
9. How does the endoskeleton of vertebrates differ from that of echinoderms?
10. To what can be attributed the fact that vertebrates have much more complex behaviors than invertebrates?
11. Why do vertebrates have greater speed and agility than most other animals?

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Section 17.3 Echinoderms and Chordates continued

In your textbook, read about evolution of vertebrate classes.

For each vertebrate in the column on the left, write the letters of all the appropriate characteristics in the column on the right.

Vertebrate	Characteristic
12. Jawless fish _____	a. gas exchange by lungs b. internal fertilization c. ectotherm
13. Cartilaginous fish _____	d. possess scales e. possess 2 pairs of legs and claws f. gas exchange by gills only
14. Bony fish _____	g. endotherm h. possess hair i. whales belong to this class
15. Amphibians _____	j. possess 2 pairs of legs with no claws k. possess feathers l. sharks belong to this class
16. Reptiles _____	m. external fertilization n. thought to have evolved from reptiles o. frogs belong to this class
17. Birds _____	p. feed their young from mammary glands q. most have gills as larva, lungs later r. turtles belong to this class
18. Mammals _____	s. have shelled eggs t. have lightweight, hollow bones

Determine if the statement is true. If it is not, rewrite the italicized part to make it true.

19. Vertebrates are subdivided into *three* major groups. _____

20. Lampreys are examples of jawless *fish*. _____

21. Bony fish have *exposed gills*. _____

22. The first animals to evolve legs were *birds*. _____

23. *Reptiles* spend part of their life cycle in water, part on land. _____

24. Only birds and one form of *mammal* are capable of sustained flight. _____

25. A high level of activity can be maintained by *ectotherms*. _____

26. Only *mammals* can provide their offspring with a readily available food source. _____

