

## Kingdom *Animalia* Concept Questions

1. What are the major characteristics that distinguish animals from plants?
2. Why is it not sufficient to classify animals simply as multicellular heterotrophs?
3. A student submits a diagram of an embryo with the three germ layers labelled. The title reads "Diagram of sponge embryo." Do you mark it right or wrong? Explain.
4. As animals became more complex, why was the development of a coelom important?
5. Jellyfish do not swim toward their prey. Rather, they capture prey that swims or drifts into their stinging tentacles. How does their body plan limit them to this type of behaviour?
6. Why is bilateral symmetry an important development in the evolution of animals?
7. Give a possible reason why bivalves have not tended toward cephalization.
8. Earthworms have more light sensitive cells in the anterior and posterior segments than in other parts of the body. How is this advantageous?
9. How has the digestive system of planaria been improved over that of the jellyfish?
10. How have the digestive systems of the roundworm and segmented worm been improved compared to that of flatworms?
11. What is meant by segmentation? How is segmentation an evolutionary advantage?
12. It might seem weird at first, but why are sponges classified as part of the animal kingdom?
13. Why are open circulatory systems found mostly in animals that are small?
14. Some organisms have a circulatory system with blood but the blood has no hemoglobin. What is the function of the blood in these organisms? Why is it an advantage to have hemoglobin in the blood?
15. Why is it helpful for an organism to be able to reproduce both sexually and asexually?
16. Why are gills necessary in more complex organisms such as molluscs?
17. a) Why does the presence of an exoskeleton require the presence of jointed appendages?  
b) What are the advantages and disadvantages of an exoskeleton?
18. The compound eyes of insects are better at detecting motion than fine detail. How might the ability to detect motion be advantageous for an insect?
19. What is a tracheal respiratory system? Why is it an advantage? Why is this especially important for flying insects?
20. Why are bilateral symmetry, muscle segmentation and the presence of a coelom not sufficient to classify an organism as a chordate?
21. How does the limb position of mammals differ from that of amphibians and reptiles and what is the significance of the position?
22. The skeletons of all terrestrial vertebrates share a common plan and even that of humans seems to be designed for an organism that walks on four legs. What do these observations suggest?
23. Many reptiles have clawed toes while amphibians do not. How might this be an advantage to them?
24. What is the major protein component in reptilian skin? What does this suggest about the evolution of birds and mammals?
25. a) Why are amphibians considered to be transitional between fishes and terrestrial vertebrates?  
b) What adaptations allowed amphibians to colonize the land?  
c) What features of the frog restrict them to living near the water?  
d) State the advantage and disadvantage of using the skin as a respiratory surface.
26. Why do organisms which use internal fertilization not produce large numbers of eggs?
27. How did the amniotic egg allow reptiles to dominate the terrestrial environment?
28. How is circulation through two loops (as in amphibians, birds, and mammals) superior to circulation through just one (as in the fishes)?

29. The blood that enters the lungs of an amphibian has relatively (more, less) oxygen than the blood that enters the gills of a fish. The reason for this is that the blood that goes from an amphibian's heart to its lungs is \_\_\_\_\_. The blood that is carried to all organs of a fish's body is \_\_\_\_\_. The blood that is carried to the fish's gills is \_\_\_\_\_. The blood that is carried to the organs of an amphibian is \_\_\_\_\_.
30. Why is the three chambered amphibian heart not as efficient as a four chambered heart?
31. What could happen to a reptile that could not find any shade?
32. Mammals usually eat several times a day. Why are reptiles often able to go long periods without eating?
33. a) What are the advantages of being an endotherm?  
b) What is the cost?
34. There is an old expression that says someone with a small appetite "eats like a bird." Why is this expression inaccurate?
35. How has the respiratory system of birds developed over that of other vertebrates?
36. State the relationship between the time a young mammal spends with its parent and the complexity of its behaviour as an adult.
37. Imagine that you are on a fun ski weekend when you discover a frozen specimen of a prehistoric terrestrial vertebrate. Because you have an unquenchable thirst for knowledge and understanding, you absolutely MUST classify it. What characteristics would you examine to place the specimen in the correct class?