

The Evolution of Animal Diversity

1. Which one of the following is an example of convergent evolution?

- a) wing of a bat and the arm of a monkey
- b) beak of a hummingbird and lips of a cat
- c) a platypus bill and a duck's bill
- d) the webbed feet of a duck and the legs of a goat
- e) the eyes of a beetle and the ears of a frog

2. Which of the following is / are true of animals?

- a) They are multicellular.
- b) They are eukaryotic.
- c) They are heterotrophic.
- d) They lack cell walls.
- e) All of the choices are true.

3. Which one of the following statements is not true?

- a) *Hox* genes control the transformation of a zygote into an adult animal.
- b) Animals are multicellular, heterotrophic eukaryotes that obtain nutrients by ingestion.
- c) When a larval animal changes into an adult that has a radically different body form, the transformation is called metamorphosis.
- d) Most animals are haploid and reproduce asexually.
- e) Animal cells lack cell walls.

4. Animals probably evolved from

- a) plants
- b) protists
- c) fungi



- d) lichens
- e) bacteria

5. The tremendous increase in the diversity of animals beginning about 545 millions years ago is called the

- a) critical mass
- b) Cambrian explosion.
- c) Devonian diversification.
- d) Permian punctuation.
- e) None of the choices are correct.

6. Which of the following is a type of cell in sponges that picks up food, digests it, and carries the nutrients to other cells?

- a) choanocytes
- b) amoebocytes
- c) spicules
- d) spongin
- e) porocytes

7. Which of the following characteristics of sponges are similar to those of protists?

- a) Sponges have simple tissues that are similar to those of many of the protists.
- b) Sponges lack a digestive tract and digest their food outside of their cells.
- c) Sponges form a protective cyst stage, as do many of the protists.
- d) Sponges are photosynthetic, as are several species of protists.
- e) Sponges have highly organized tissues, as do some of the more highly evolved protists.

8. Radial symmetry is exhibited by which of the following animals?

- a) flatworms and annelids

- b) cnidarians and some sponges
- c) roundworms and cnidarians
- d) flatworms and cnidarians
- e) annelids and some sponges

9. Which one of the following is not a characteristic of cnidarians?

- a) Most cnidarians live in fresh water.
- b) The digestive compartment of cnidarians is called the gastrovascular cavity.
- c) The more stationary cnidarian body type, which is cylindrical with a ring of tentacles, is the polyp.
- d) The cnidarian body type that is able to move about freely in the water is a medusa.
- e) Cnidarians are named for their special stinging cells called cnidocytes.

10. The development of a head where sensory structures are concentrated accompanied the evolution of

- a) the tissue level of organization
- b) bilateral symmetry
- c) protostomes
- d) a gastrovascular cavity
- e) arthropods

11. Which one of the following is not a characteristic of flatworms?

- a) radial symmetry
- b) habitat includes marine, freshwater, and damp terrestrial environments
- c) a highly branched gastrovascular cavity
- d) members of the phylum include planarians, flukes, and tapeworms
- e) no anus



12. You find a vaguely wormlike animal in a mud flat. It is bilaterally symmetrical, is segmented, has a coelom, and has a complete digestive tract with the anus opening at the tip of the body. Which of the following choices correctly pairs one of these characteristics with a phylum it rules out?

- a) A complete digestive tract rules out Annelida.
- b) A coelom rules out Platyhelminthes.
- c) Segmentation rules out Chordata.
- d) Bilateral symmetry rules out Mollusca.
- e) An anus opening at the tip of the tail rules out Arthropoda.

13. A bilaterally symmetrical, wormlike animal that has a pseudocoelom, a complete digestive tract, and a transparent cuticle could be a member of which one of the following phyla?

- a) Cnidaria
- b) Platyhelminthes
- c) Annelida
- d) Nematoda
- e) Chordata

14. Which one of the following is not a characteristic of mollusks?

- a) a true coelom
- b) separate sexes in most species
- c) usually a shell produced by the mantle
- d) three main parts of the body: head, trunk, and tail
- e) commonly a rasping organ called a radula

15. Which one of the mollusk groups usually consists of sedentary animals that use mucus-coated gills to trap fine food particles as water is pumped between the two hinged shells surrounding the body?

- a) cephalopods



- b) gastropods
- c) chitons
- d) bivalves
- e) scaphopods

16. Segmentation

- a) in earthworms is homologous to the segmentation of vertebrates
- b) evolved earlier than did bilateral symmetry
- c) is a characteristic of sponges
- d) is the ability to regenerate two individual organisms from a single organism that has been cut in half
- e) increases mobility

17. Which one of the following is not a characteristic of annelids?

- a) segmentation
- b) a pseudocoelom
- c) an anus
- d) habitat includes marine, freshwater, and damp soil
- e) over 15,000 species

18. Animals that are segmented and have jointed appendages and an exoskeleton are members of the phylum

- a) Platyhelminthes.
- b) Mollusca.
- c) Annelida.
- d) Cnidaria.
- e) Arthropoda.



19. The most numerous and widespread animal phylum is characterized by all of the following features except

- a) an exoskeleton that is periodically shed
- b) jointed appendages
- c) segmentation
- d) a mantle
- e) a true coelom

20. Most insects have three body parts. They are the

- a) head, body, and legs
- b) head, thorax, and abdomen
- c) antennae, head, and abdomen
- d) head, legs, and wings
- e) legs, wings, and body

21. Which one of the following statements is not correct?

- a) Houseflies, gnats, fruit flies, and mosquitoes are members of the order Diptera.
- b) Ants, bees, and wasps are members of the order Hymenoptera.
- c) Moths and butterflies are members of the order Lepidoptera.
- d) Beetles are members of the order Coleoptera.
- e) Grasshoppers, walking sticks, and cockroaches are members of the order Odonata.

22. How do moths and butterflies take in nectar?

- a) They absorb it through their feet.
- b) They suck it through a tube consisting of modified mouthparts.
- c) They sop it up with a spongelike "tongue."
- d) They absorb it through the cuticle of a whiplike structure made of modified mouthparts.



- e) They chew the flower's nectary.

23. Which of the following is the largest order in the animal kingdom, having about 500,000 species?

- a) Diptera
- b) Coleoptera
- c) Hymenoptera
- d) Lepidoptera
- e) Odonata

24. Which one of the following is a unique feature of echinoderms?

- a) bilateral symmetry
- b) a water vascular system
- c) radial symmetry
- d) a deuterostome pattern of development
- e) free-swimming larvae

25. Which of the following is / are unique to chordates?

- a) bilateral symmetry
- b) a coelom
- c) a notochord
- d) segmentation
- e) a complete digestive tract including an anus

26. You find a small, elongated animal embedded in sand with one end sticking out. It has

segmental musculature, a coelom, a series of pores on either side of the body, and a complete

digestive tract with an anus located partway down the body. This animal is

- a) an annelid



- b) either an annelid or a larval echinoderm
- c) either an annelid, a larval echinoderm, or a chordate
- d) either a larval echinoderm or a chordate
- e) a chordate

27. The flexible, longitudinal rod that is located between the digestive tract and the nerve cord in chordates is called the

- a) spinal cord
- b) notochord
- c) vertebral column
- d) coelom rod
- e) spine

28. Which of the following statements about tunicates indicate(s) that these animals are chordates and not anything else?

- a) Larvae show segmentation, radial symmetry, and a pseudocoelom.
- b) Larvae have a dorsal hollow nerve cord, a postanal tail, pharyngeal slits, and a notochord.
- c) Larvae and adults both have a true coelom.
- d) Larvae and adults both feed by filtering water and trapping small food particles.
- e) None of the choices are correct.

29. While at the beach you observe a small sessile organism that is a filter feeder. You collect a sample of the organism and bring it to your biology instructor. Your instructor tells you that

the larval stage of the organism has a notochord and gill structures. From this information you can be sure that the organism

- a) is an arthropod
- b) has never before been observed



- c) is a chordate
- d) could also live in fresh water
- e) has a free-swimming form

30. Which of the following is characteristic of vertebrates?

- a) a skull and a backbone consisting of vertebrae
- b) a skeleton made of bone and four legs
- c) a backbone consisting of vertebrae and a jaw
- d) a backbone consisting of vertebrae and four legs
- e) four legs and a jaw

31. Agnathans differ from fishes in which of the following ways?

- a) They lack a backbone.
- b) They lack an endoskeleton.
- c) They lack jaws.
- d) They lack paired fins.
- e) They lack jaws and they lack paired fins.

32. Which one of the following is not a characteristic of animals in the group Chondrichthyes?

- a) jaws
- b) vertebrae
- c) a flexible skeleton made of cartilage
- d) a lateral line system
- e) a swim bladder

33. Which one of the following is not a characteristic of animals in the group Osteichthyes?

- a) an operculum



- b) a lateral line system
- c) a flexible skeleton made of cartilage
- d) swim bladder
- e) flattened scales covering the skin

34. Which one of the following is not true about amphibians?

- a) Amphibians were the first terrestrial vertebrates.
- b) Lungs and appendages for support evolved first in amphibians.
- c) Amphibians usually lay their eggs in water.
- d) Most amphibian life cycles include a metamorphosis.
- e) Larval amphibians have a lateral line system resembling that in fishes.

35. Which of the following choices pairs a characteristic with two groups in which it is found?

- a) amniotic egg: amphibians, reptiles
- b) radial body plan: flatworms and roundworms
- c) lateral line system: bony fishes, larval amphibians
- d) exoskeleton: lobsters, annelids
- e) hinged jaws: lamprey~echinoderms

36. Which one of the following is not a characteristic of animals in the group Reptilia?

- a) scales
- b) amniotic egg
- c) waterproof skin
- d) ectothermic metabolism
- e) lateral line system in larvae

37. Which of the following adaptations first appeared in reptiles and allows them to complete their life cycles on land?



- a) lungs
- b) an endothermic metabolism
- c) the amniotic egg
- d) four legs
- e) pack behavior

38. Which one of the following statements about birds is not true?

- a) Fossil evidence indicates that birds evolved from dinosaurs.
- b) Feathers evolved from scales.
- c) Most birds have an ectothermic metabolism.
- d) Birds have an amniotic egg.
- e) *Archaeopteryx* is an extinct bird.

39. Which one of the following statements about mammals is not true?

- a) Mammals evolved from reptiles.
- b) Some mammals lay eggs.
- c) Mammals have mammary glands.
- d) Mammals have hair.
- e) Like birds, mammals are ectothermic.

40. Which one of the following statements is not true?

- a) Sponges lack true tissues.
- b) Cnidarians have true tissues and radial symmetry.
- c) The invertebrate phylum most closely related to chordates is arthropoda.
- d) Annelids are protostomes with a coelom and bilateral symmetry.
- e) Flatworms have true tissues and bilateral symmetry, but no coelom and no segmentation.



41. *Australia's native species face serious challenges from*

- a) hunting
- b) introduced, alien species
- c) new diseases that have recently evolved
- d) poaching
- e) export in the pet trade

42. *Which of these animals exhibits segmentation?*

- a) jelly
- b) grasshopper
- c) planarian
- d) sponge
- e) hookworm

43. *Collectively, jawless fish are referred to as*

- a) hagfish.
- b) agnathans.
- c) cephalochordates.
- d) lampreys.
- e) urochordates.

44. *Tetrapods evolved from*

- a) reptiles
- b) sharks and rays
- c) tunicates
- d) bony fishes
- e) amphibians



45. *Chordata (the phylum to which you belong) is most closely related to the*

- a) Nematoda.
- b) Porifera.
- c) Cnidaria.
- d) Arthropoda.
- e) Echinodermata.

46. *Arthropods are most closely related to*

- a) echinoderms
- b) mollusks
- c) platyhelminthes
- d) cnidarians
- e) annelids

