

# Biology SG Module #13

1.
  - A. Vertebrae-Segments of bone or some other hard substance that are arranged into a backbone
  - B. Notochord-A rod of tough, flexible material that runs the length of a creature's body, providing the majority of its support
  - C. Endoskeleton-A skeleton on the inside of a creature's body, typically composed of bone or cartilage
  - D. Bone Marrow-A soft tissue inside the bone that produces blood cells
  - E. Axial Skeleton-The portion of the skeleton that supports the head, neck, and trunk
  - F. Appendicular Skeleton-The portion of the skeleton that attaches to the axial skeleton and has the limbs attached to it
  - G. Closed Circulatory System-A circulatory system in which the oxygen-carrying blood cells never leave the blood vessels
  - H. Arteries-Blood vessels that carry blood away from the heart
  - I. Capillaries-Tiny, thin-walled blood vessels that allow the exchange of gasses and nutrients between the blood and the cells of the body
  - J. Veins-Blood vessels that carry blood back to the heart
  - K. Olfactory Lobes-The lobes of the brain that receive signals from the receptors in the nose
  - L. Cerebrum-The lobes of the brain that integrate sensory information and coordinate the creature's response to that information
  - M. Optic Lobes-The lobes of the brain that receive signals from the receptors in the eyes
  - N. Cerebellum-The lobe that controls involuntary actions and refines muscle movement
  - O. Medulla Oblongata-The lobes that coordinate vital functions, such as those of the circulatory and respiratory systems, and transport signals from the brain to the spinal cord
  - P. Internal Fertilization-The process by which the male places sperm inside the female's body, where the eggs are fertilized
  - Q. External Fertilization-The process by which the female lays eggs and the male fertilizes them once they are outside of the female
  - R. Oviparous Development-Development that occurs in an egg that is hatched outside the female's body
  - S. Ovoviviparous Development-Development that occurs in an egg that is hatched inside the female's body
  - T. Viviparous Development-Development that occurs inside the female, allowing the offspring to gain nutrients and vital substances from the mother through a placenta
  - U. Anadromous-A life cycle in which creatures are hatched in fresh water, migrate to salt water as adults, and then go back to fresh water in order to reproduce
  - V. Bile-A mixture of salts and phospholipids that aids in the breakdown of fat
  - W. Atrium-A heart chamber that receives blood
  - X. Ventricle-A heart chamber from which blood is pumped out
  - Y. Ectothermic-Lacking an internal mechanism for regulating body heat
  - Z. Hibernation-A state of extremely low metabolism and respiration, accompanied by lower-than-normal body temperatures
2. Frog=Class Amphibia  
Shark=Class Chondrichthyes  
Lancelet=Subphylum Cephalochordata  
Carp=Class Osteichthyes

Sea Squirt=Subphylum Urochordata

Lamprey Eel=Class Agnatha

3. They all have notochords at some point in their life
4. Cartilage is not reinforced with calcium salts
5. A capillary
6. Carry oxygen
7. Hemoglobin
8. The cerebellum
9. The optic lobes
10. Internal fertilization, oviparous development
11. A lamprey
12. They live an anadromous life
13. Their lateral line
14. They use it to sense vibrations
15. They stabilize them, it acts as a means of protection
16. A ray's tail is thinner than the tail of a skate
17. A. esophagus, B. brain, C. spinal cord, D. stomach, E. air bladder, F. kidney, G. gonad, H. anus, I. intestine, J. pyloric ceca, K. gall bladder, L. liver, M. heart, N. gills
18. Food goes through the esophagus, the brain reacts and coordinates movement, spinal cord is the backbone, stomach breaks down food, air bladder controls buoyancy, kidney cleans blood, gonad is for sexual reproduction, anus poops, intestine processes nutrients, pyloric ceca secrete enzymes, gall bladder holds bile, liver secretes bile, heart pumps blood, gills perform respiration
19. A. anterior cardinal vein, B. efferent brachial arteries, C. dorsal aorta, D. kidney, E. posterior cardinal vein, F. atrium, G. ventricle, H. ventral aorta, I. afferent brachial arteries, J. gills
20. Veins-A, E, H  
Arteries-B, C, I  
Neither-D, F, G, J

21. Endoskeleton made mostly of bone, Smooth skin with many capillaries and pigments (no scales), two pairs of limbs with webbed feet (usually), as many as four organs for respiration, three chambered heart, oviparous with external fertilization
22. A toad has dry bumpy skin, a frog has wet smooth skin
23. Their skin