

Life Science 7

Ch 16-1, "What Are Vertebrates"
p 412-419

- Objectives
- List the four common body parts of chordates
- Describe the two main characteristics of vertebrates
- Explain the difference between an ectotherm and an endotherm
- Describe four characteristics that fishes share
- Describe the three classes of living fish and give an example of each

Phylum Chordata:

■ General Characteristics

- _____: a flexible dorsal supporting rod
- _____: most other organisms have two nerve tubes, which are solid
- _____: gill slits generally persist in aquatic chordates, but are reabsorbed in terrestrial chordates
- _____: may be lost as embryo develops

Phylum Chordata: Classification

- Three subphyla
- **subphylum Urochordata**: the tunicates, or "sea squirts", invertebrate
- **subphylum Cephalochordata**: *Amphioxus*, or "the lancelets", invertebrate
- **subphylum Vertebrata**: the vertebrates

The Tunicates

- tunicates: have the following characteristic
 - adults: _____ (see fig 36-1, p537)
 - develop a protective outer layer ("tunic") made of _____ (normally, a plant polysaccharide!)
 - only the _____ remain, which suggest the animal is a chordate

- reproduce asexually through budding, sexually (hermaphroditic)
- larvae: have all chordate characteristics, and resemble tadpoles

The Lancelets

- (lancelet, *Amphioxus*) (see fig 36-3 p 538)
 - possess all chordate characteristics
 - free living animals, live in shallow water where they burrow in the sand or swim freely
 - resemble fish, but lack _____, _____, _____
 - may be similar to fish ancestor

The Vertebrates

- Largest of the chordate subphyla
- Distinguished by the presence of **vertebrae**: _____
- Includes 7 classes
 - Class Agnatha: the jawless fish (_____)
 - Class Chondrichthyes: the cartilaginous fish (_____)
 - Class Osteichthyes: the _____
 - Class Amphibia: the _____
 - Class Reptilia: the _____
 - Class Aves: the _____
 - Class Mammalia: the _____

Warm Blooded vs. Cold Blooded

- _____: “warm-blooded” *animals that keep their body temperature constant, in spite of external conditions*
 - use the heat generated from cellular respiration
 - includes _____
- _____: “cold-blooded” *animals in which the body temperature changes with their external conditions*
 - includes _____

Adaptations of Fishes

- Living in water affects the structure of fishes
 - Encourages streamlining to deal with water resistance to motion
 - _____: fan-like structures used by fish to steer and maneuver throughout the water
 - _____: cover the body of a fish, used to protect the fish and reduce friction
 - Encourages development of structures which make fish boyant (eg: _____)
 - _____ used to trap oxygen dissolved in the water
 - _____: line of sensory cells on the sides of fish used to detect vibrations in water

The Jawless Fish (Class Agnatha)

- Contains about 45 species of lampreys (see Figure 8, p379) and hagfish
- Known as “jawless fish”, or “cyclostomes”, which means “round mouths”
- Lack scales and paired fins
- Most lampreys are _____, hagfish is a _____

-
- Some lampreys can live in freshwater, and are threatening the freshwater fishing industry of the Great Lakes

Sharks (Class Chondrichthyes)

- About 275 species of sharks, skates and rays
- All have a skeleton made of cartilage
- Sharks:
 - Includes a wide variety of sizes and lifestyles
 - _____: biggest fish, but is a _____!
 - Sharks have nasty reputation, but only about _____ of species are known to attack humans
 - Sharks have extremely keen sense of _____
 - _____ of sharks are constantly being replaced
 - Sharks are “living fossils”, they have been around for a very long time with little change

Skates/Rays (Class Chondrichthyes)

- Skates and Rays

- _____ body shape, useful for laying along the bottom of ocean to wait for prey
- Some are _____ (manta ray) others feed on crustaceans
- Possess two openings (spiracles) on the top of the head to allow water to enter gills

Bony Fish (Class Osteichthyes)

- Largest class of vertebrates (25,000 species)

- Includes three main groups

- _____: possess fins supported by long bones (**rays**)
 - most common group, includes common fish
- _____: includes the coelocanth
 - Lobe finned fishes are probably ancestral to the amphibians
- _____: two species exist, both have functional lungs, used to survive harsh conditions