Biology 10

Ch 26-2 Part 1: p757-761

Phylum Chordata:

- General Characteristics
  - **notochord**: a _____
  - **dorsal hollow nerve tube**: most other organisms have two nerve tubes, which are solid
  - **pharyngeal gill slits**: gill slits generally persist in aquatic chordates, but are reabsorbed in terrestrial chordates
  - Deuterostomes: similar to _____ (indicates possible common ancestor)

Phylum Chordata: Classification

- Three subphyla
- **subphylum Urochordata:** the _____, invertebrate
- **subphylum Cephalochordata**: *Amphioxus*, or "_____", invertebrate
- **subphylum Vertebrata**: _____

The Urochordatans

- tunicates: have the following characterstic
  - adults: _____ (see DOL: 46-47)
  - develop a protective outer layer ("tunic") made of _____ (normally, a plant polysaccharide!)
  - only the gill slits remain, which suggest the animal is a chordate
  - reproduce asexually through budding, sexually (hermaphroditic)
  - larvae: have all chordate characteristics, and _____

Subphylum Cephalochordata

- (lancelet, *Amphioxus*) (see DOL: 47)
  - 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

Subphylum Vertebrata

- Largest of the chordate subphyla
- Distinguished by the presence of **_____**: bones which replace the notochord during development and surround the nerve tube
- Includes 7 classes
  - Class Agnatha: the _____ (lamprey)
  - Class Chondrichthyes: the _____ (shark, skate, ray)
  - Class Osteichthyes: the _____
  - Class Amphibia: the_____
  - Class Reptilia: the _____
  - Class Aves: the _____
  - Class Mammalia: the _____

Adaptations of Fishes

- Living in water affects the structure of fishes
  - Encourages _____ to deal with water resistance to motion
  - Encourages development of structures which make fish boyant (eg: swim bladders)
  - Gills used to trap oxygen dissolved in the water
  - **lateral line system**: _____
    _____

Evolution of Fishes

- First known vertebrates were small jawless fish called **ostracoderms** (Class Ostracodermi)
- Ostracoderms evolved to form two fish groups, the **agnathans**, and the **placoderms**
  - Class Agnatha: includes lamprey and hagfish
- The placoderms evolved to form two other classes
  - Class Chondrichthyes: includes sharks, skates, rays
  - Class Osteichthyes: includes bony fish

Class Agnatha

- Contains about 45 species of _____ (see DOL: 49) and _____
- Known as “jawless fish”, or “cyclostomes”, which means “round mouths”
- Lack scales and paired fins
- Most lampreys are _____, hagfish is a deep water _____
  - Some lampreys can live in freshwater, and are threatening the freshwater fishing industry of the Great Lakes

Class Chondricthyes

- About 275 species of _____
- All have a skeleton made of _____
- Sharks:
  - Includes a wide variety of sizes and lifestyles
    - Whale shark: biggest fish, but is a filter feeder!
  - Sharks have nasty reputation, but only about 10 percent of species are known to attack humans
  - Sharks have extremely keen sense of smell
  - Teeth of sharks are constantly being replaced
  - Sharks are “living fossils”, they have been around for a very long time with little change

Class Chondricthyes

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

Class Osteicthyes

- Largest class of vertebrates (25,000 species)
  - Includes three main groups
  - **Ray finned fishes**: possess fins supported by long bones (**rays**)

- most common group, includes common fish

- **Lobe finned fishes**: includes the _____
  - Lobe finned fishes are probably ancestral to the amphibians

- **Lungfishes**: two species exist, both have functional lungs, used to survive harsh conditions

Amphibian Evolution

- Most likely developed as a result of selective pressures (lack of space, food in oceans)
- Likely have evolved from lobe-finned fishes
  - **crossopterygians**- _____ (345 mya)

Characteristics of Amphibians

- Ectothermic (cold blooded)- _____ to raise metabolic rate
  - may become dormant under severe temperatures (**hibernation** under cold, **estivation** under hot)
- Larval stage is _____
  - gills, fins present

Characteristics of Amphibians

- Adult stage is _____
  - may have gills or lungs, legs instead of fins
  - change from young to adult = **metamorphisis**
- smooth moist skin (_____)

Characteristics of Amphibians

- webbed feet (when present)
- Two chambered hearts in larva, three chambered in adults
- _____. Must be kept moist to avoid drying out
- Well developed nervous, reproductive, circulatory, digestive systems

Classification

- Class Amphibia (2375 sp), contains 3 orders
  - Order Anura
    - includes _____ (wet environment) and _____ (drier environments)
    - usually external fertilization
    - Young called **tadpoles**

Classification

- Order Urodela
  - includes _____
  - elongated bodies, long tails

- usually live in moist environments
- external or internal fertilization

Classification

- Order Apoda
  - includes _____
  - lack limbs, reduced eyes (wormlike in appearance
  - internal fertilization
  - live in tropical regions, _____

Classification

- Order Trachystoma
  - includes _____
  - found in eastern U.S. and northern Mexico
  - _____