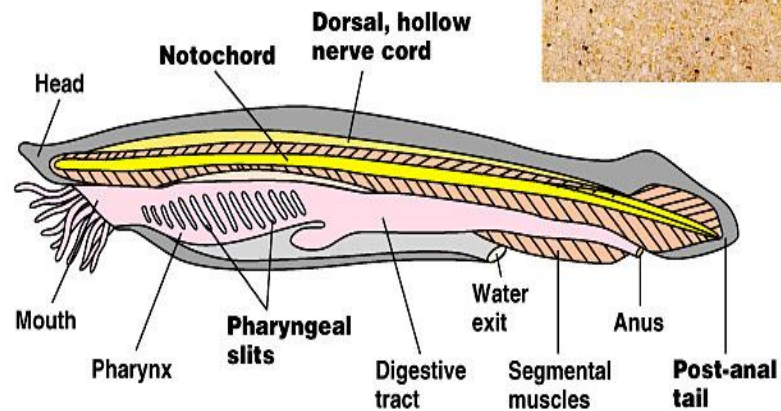
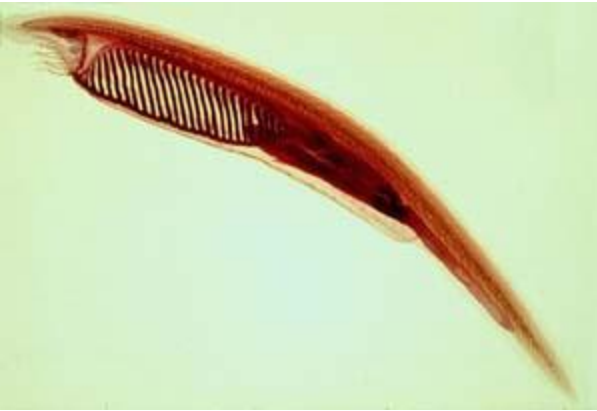


Phylum: Chordata

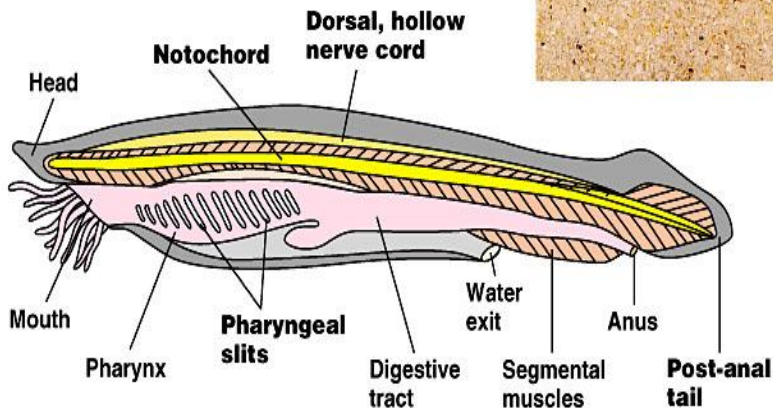
- **Organisms with a dorsal nerve cord**
- **Bilateral symmetrical**
- **Can be vertebrates or invertebrates**



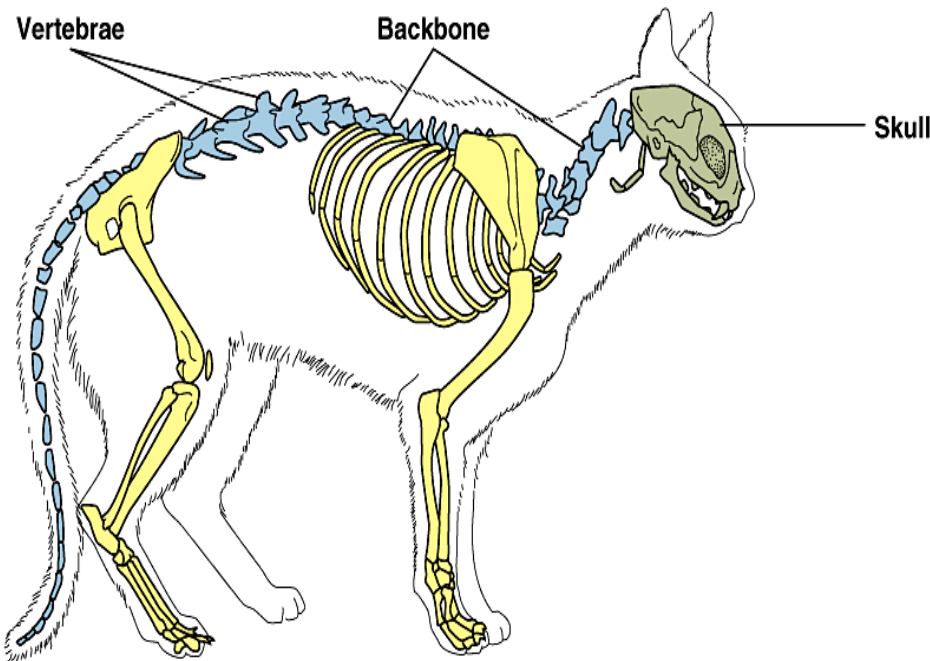
Invertebrate chordates - tunicates and lancelets



- Small chordates that live in marine sand
- Have chordate features and segmental muscles which allow them to swim slowly



Vertebrates – animals with a segmented backbone



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- Distinguishing features are a skull and a backbone composed of a series of segmented units called vertebrae which enclose the main parts of the nervous system
- Most also have skeletal parts supporting their body appendages
- The skeleton is made of either flexible cartilage or a combination of hard bone and cartilage

Most vertebrates have hinged jaws



- Sea lampreys are some of the few vertebrates without hinged jaws (two skeletal parts held together by a hinge)
- Lampreys have an unhinged toothed, sucking disk that bores a hole in the side of a fish and sucks its blood

Fishes – Jawed vertebrates with gills and paired fins

Rainbow trout,
a ray-fin



Coelacanth,
a lobe-fin



- Gills extract oxygen from water
- Paired fins help maneuver the body when swimming.
- Nearly all fishes are carnivorous
- Most fish lay eggs
- Sharks and rays have skeletons made of cartilage
- all other fish have bony skeletons

Amphibians – living a double life



- Most are tied to water because their eggs and bodies dry out in the air
- Many go through a metamorphosis
- Examples are frogs and salamanders

Reptiles – lizards, snakes, turtles, crocodiles and alligators



- Covered with waterproofed scales
- Eggs have shells that retain water
- “cold blooded” – do not use metabolism to control body temperature

Birds



- Many features help reduce weight for flight: lack teeth, tail has only a few vertebrae, feathers have hollow shafts, bones have a honeycombed structure
- High rate of metabolism
- Excellent vision and relatively large brains

Mammals



- Hair and mammary glands that produce milk to nourish young are the hallmarks
- Three groups:
 - MONOTREMES are egg-laying (platypus)
 - MARSUPIALS have embryonic young that they then nurse in a pouch
 - PLACENTALS have a longer lasting association between mother and the developing young in utero