

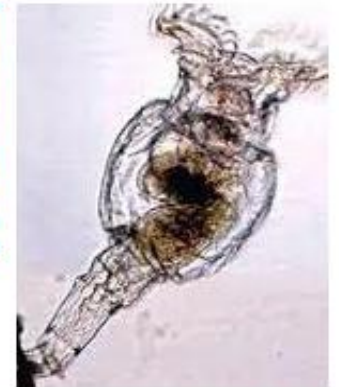
Kingdom Animalia

Kingdom Animalia

• Classification based on:

- **Body organization:**
 - tissues, organs, organ systems?
- **Germ layers:**
 - 2 or 3 layers during development?
- **Symmetry:**
 - radial or bilateral?
- **Digestive tract:**
 - separate openings for mouth and anus?
- **Body cavity:**
 - true, partial, or absent?

- Eukaryotic
- Multi-cellular
- Lack cell walls
- Heterotrophic



Germ Layers

Germ Layers are the layers of cells in a developing embryo.



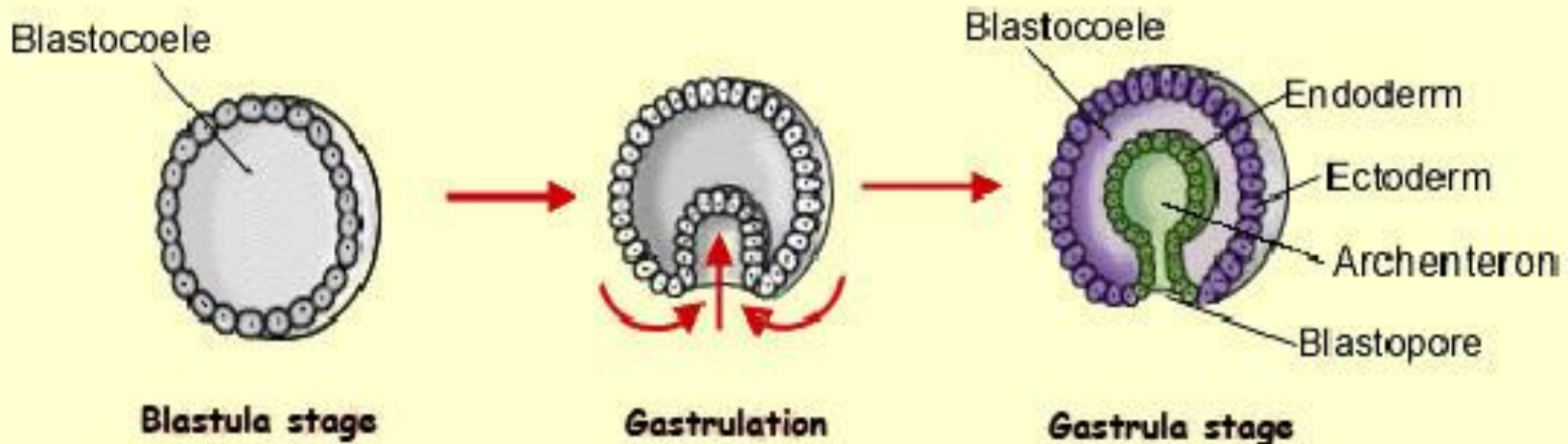
Ectoderm (outer layer) → produces the skin, nerve tissue, and some sensory organs

Endoderm (inner layer) → lungs, liver, pancreas, bladder, and lining of the gut

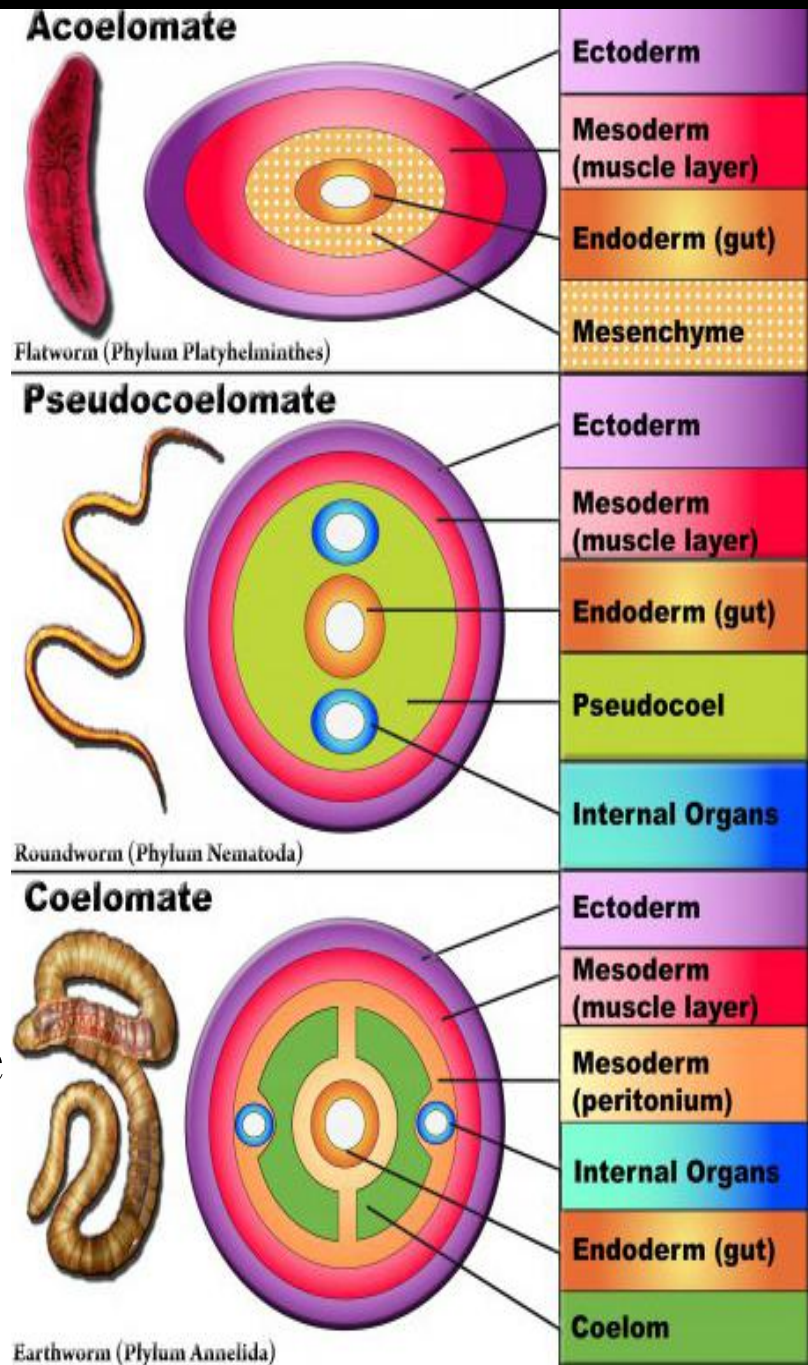
• **Mesoderm** (middle layer) → muscles, blood, kidneys and reproductive organs

Three germ layers: deuterostomes

Two germ layers: protostomes



- The three germ layers (endoderm, mesoderm and ectoderm) encompass the precursors of all structures and organs of the entire body, and are generated by a process called gastrulation (occurs at the early stage of the embryonic development).
- Coelom: is a body cavity that is present in some animals, contains internal organs
- Body cavities of animals become increasingly more complex as one ascends the evolutionary tree



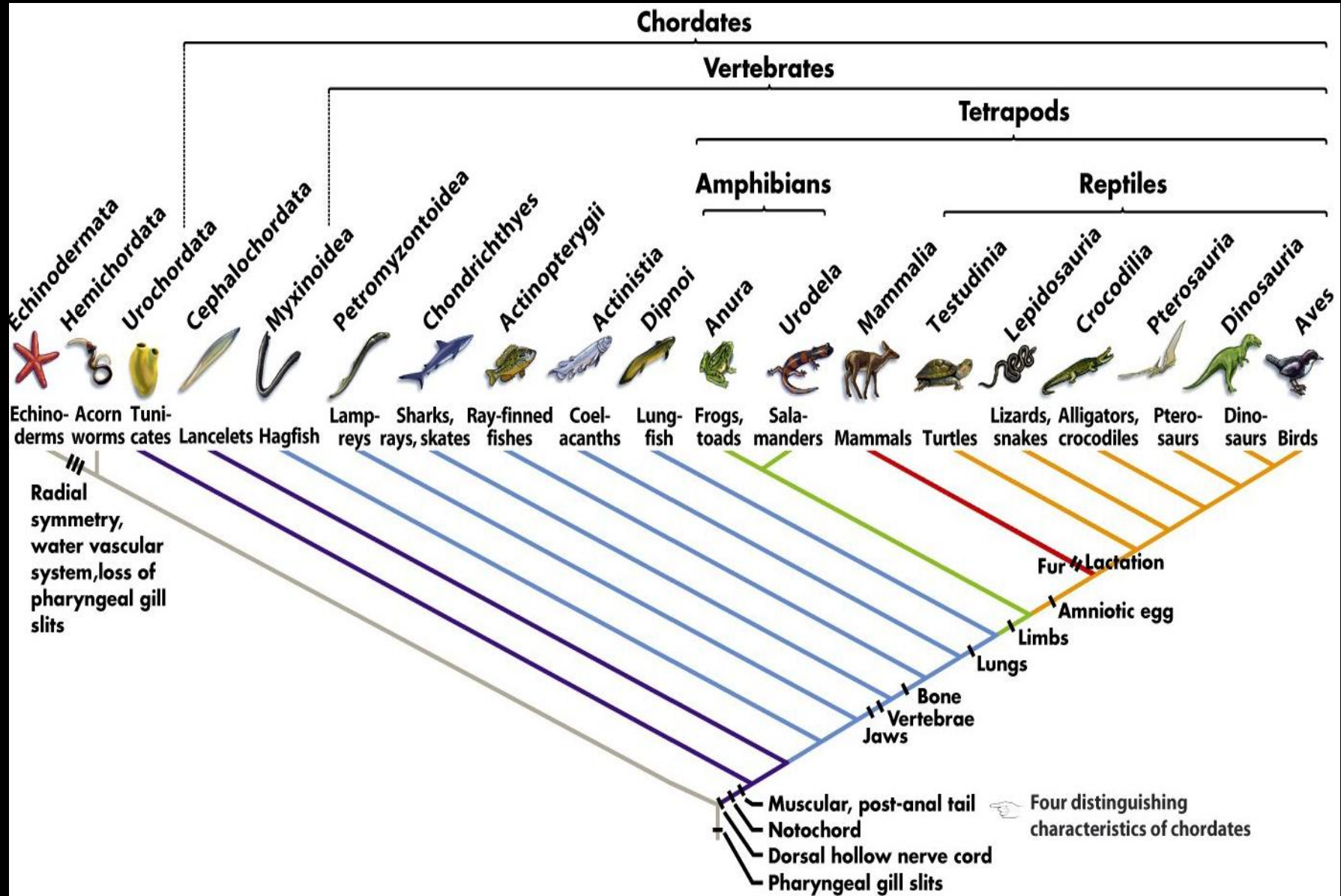
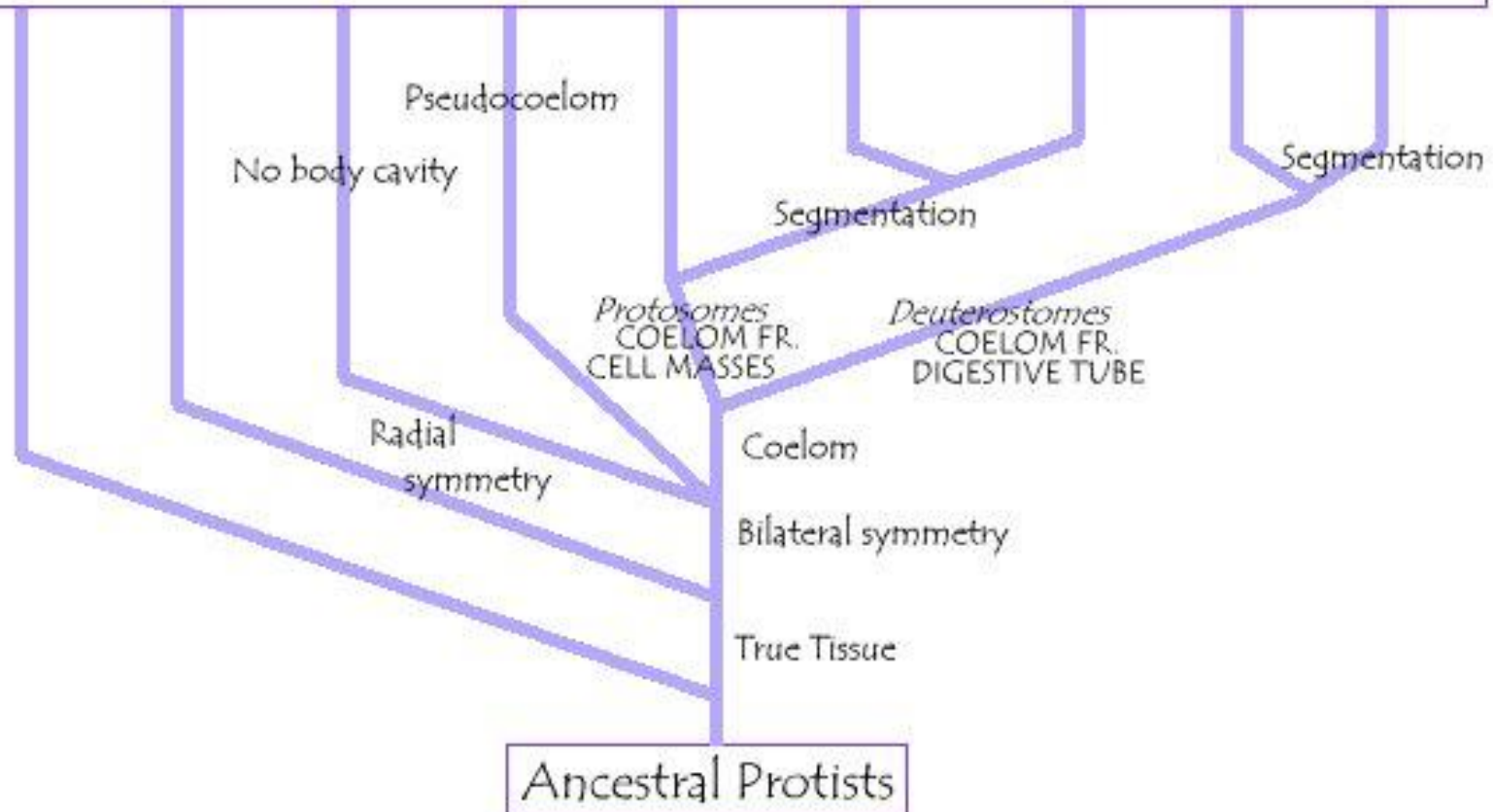


Figure 33-7 Biological Science, 2/e

Present Day Phyla

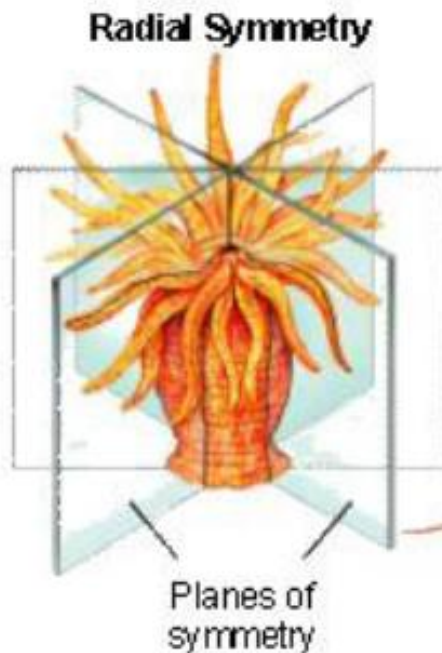


Phylogenetic Tree of *KINGDOM ANIMALIA*

Types of Symmetry

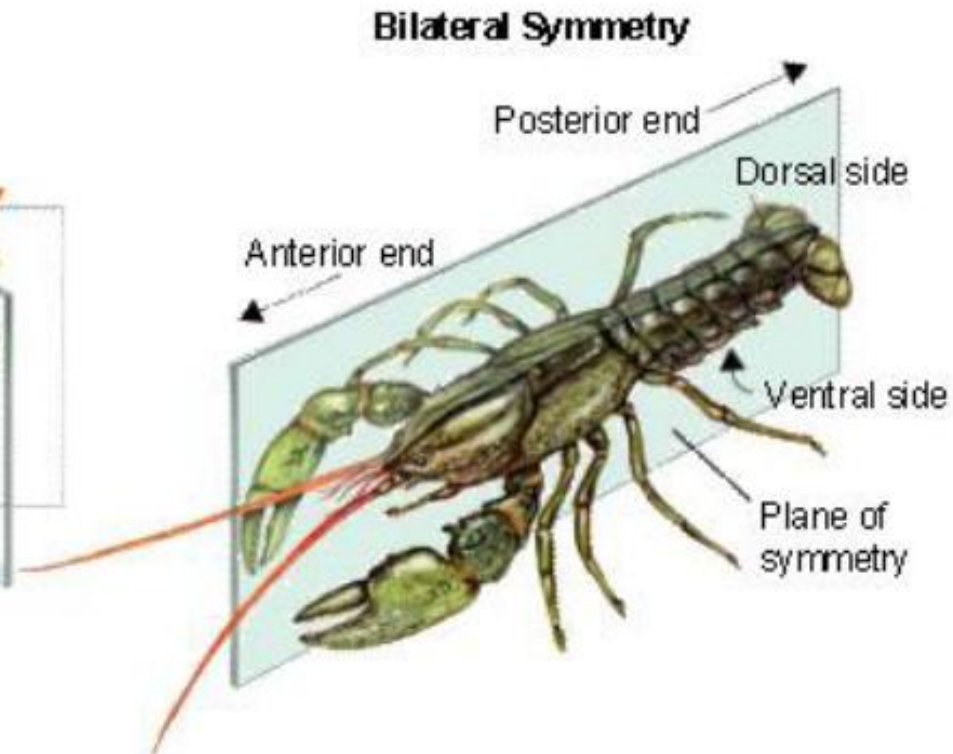
Radial Symmetry

- All divisions symmetrical



Bilateral Symmetry

- True "head" region



10 Phyla:

- **Porifera** (sponges)
- **Cnidaria** (jellyfish, hydra)
- **Platyhelminthes** (tapeworms, flatworms)
- **Nematoda** (hookworms, pinworms)
- **Rotifera** (rotifers)
- **Annelida** (earthworms)
- **Mollusca** (clams, squids, snails)
- **Arthropoda** (insects, crabs, spiders)
- **Echinodermata** (starfish, urchins)
- **Chordata** (fish, amphibians, birds, reptiles, mammals)

Phylum Porifera

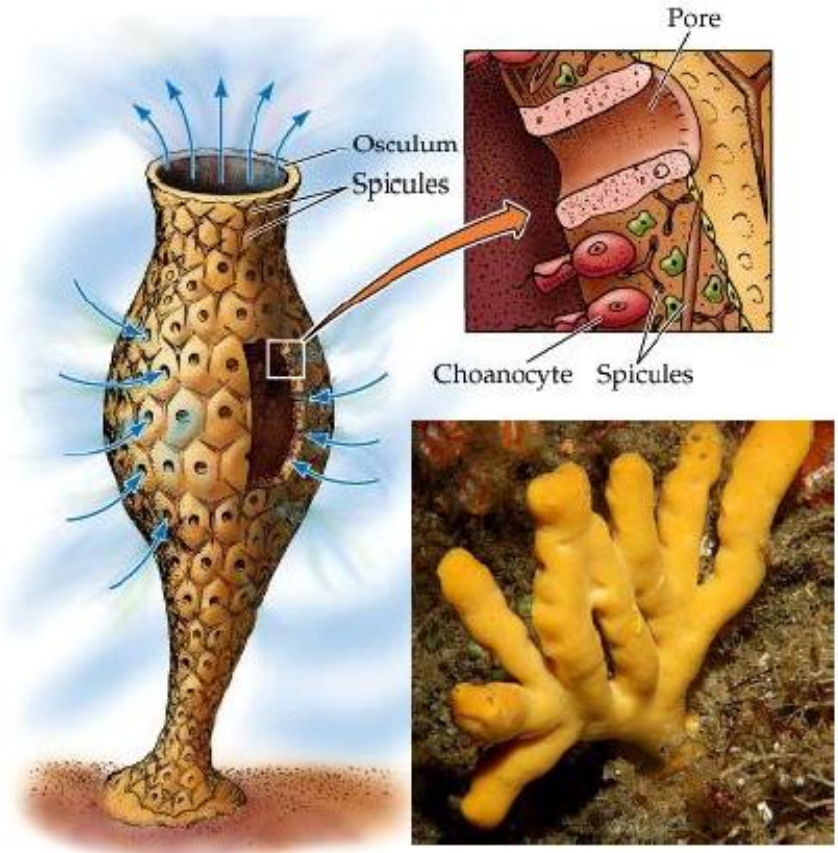
• Sponges

• Characteristics:

- Sessile
- Irregular shape
- No mouth or digestive cavity

1. How does a sponge feed?

2. What is the role of the choanocytes?



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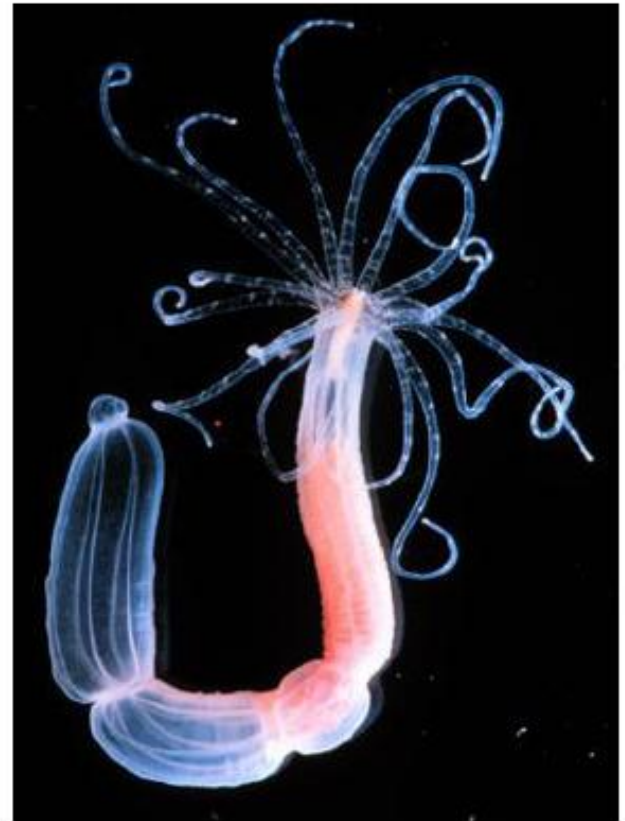
<http://www.youtube.com/watch?v=RmPTM965-1c&feature=related>

Phylum Cnidaria

- **Characterisitcs:**
 - Radial symmetry
 - Stinging cells
 - Mouth/anus share same opening



- Hydra
- Jellyfish

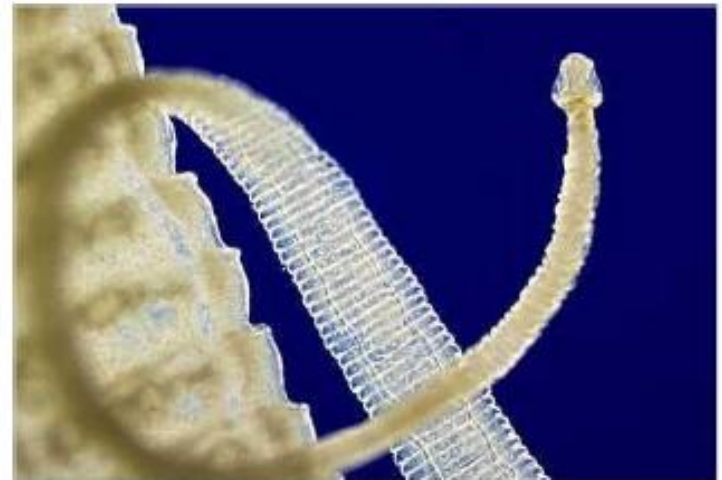
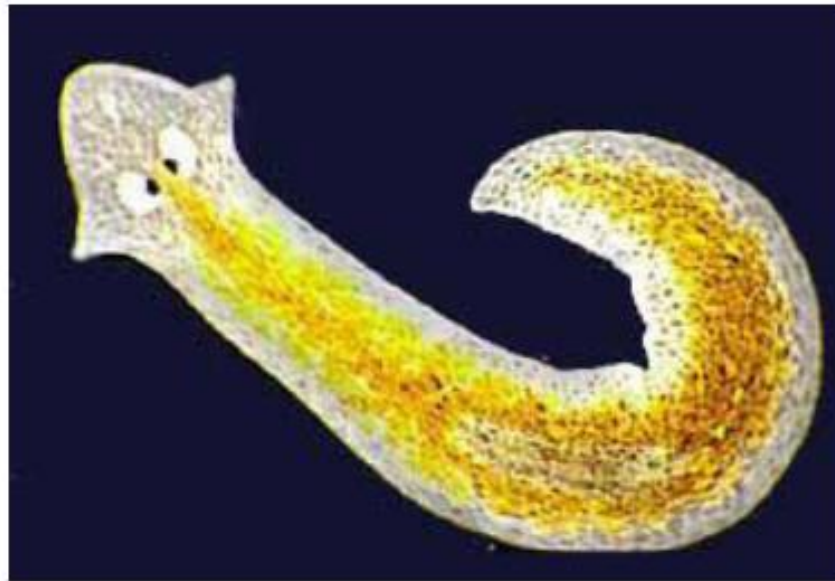


Phylum Platyhelminthes

- **Characterisitcs:**

- Bilateral symmetry
- Flattened body
- Freelifving or parasitic

- Flatworms
- Tapeworms



Phylum Nematoda

- **Characterisitcs:**
 - Bilateral symmetry
 - Freelifving or parasitic

- Hookworm
- Pinworm

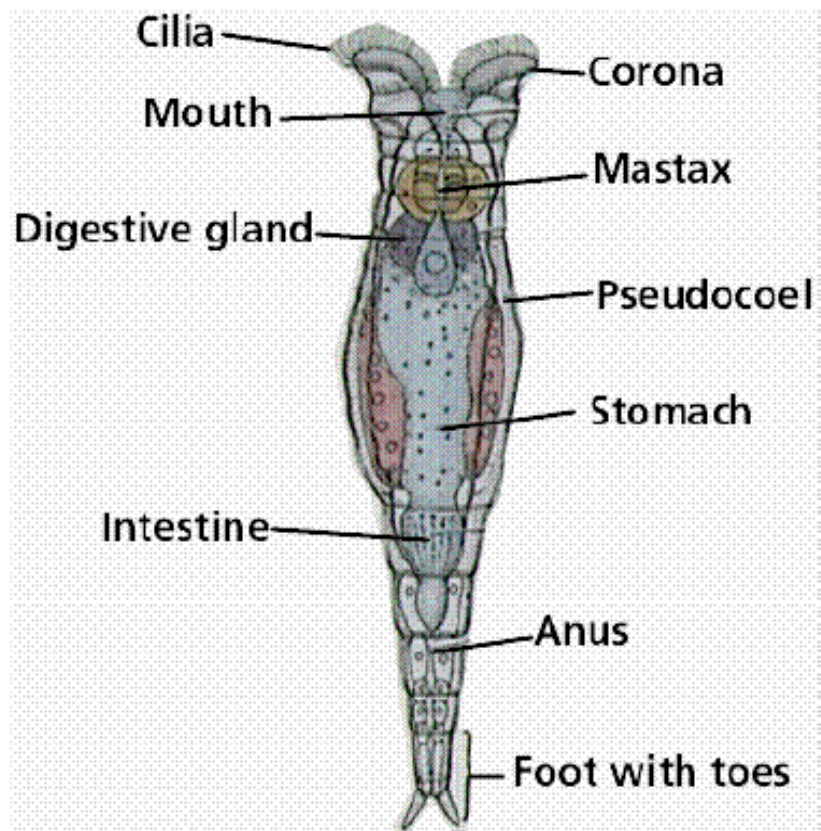


Phylum Rotifera

- **Characterisitcs:**
 - Cilia sweep food into “mouth”
 - Anchored by “foot”



- Rotifers
“wheel animals”



Phylum Annelida

- **Characterisitcs:**
 - Segmented body cavity
 - Mouth and anus

- Earthworms
- Leeches
- Polychaetes



Phylum Mollusca

- **Characterisitcs:**
 - Shell present in many forms
 - Muscular foot



- Snails
- Clams, mussels
- Octopi, squids



Phylum Arthropoda

- **Characteristics:**
 - Segmented body
 - Jointed legs/ appendages
 - External Skeleton



- Insects
- Spiders
- Crabs, Lobster



Over 1 MILLION species!!!

Phylum Echinodermata

- **Characterisitcs:**
 - Larval form: bilateral symmetry
 - Adult form: radial symmetry

- Starfish

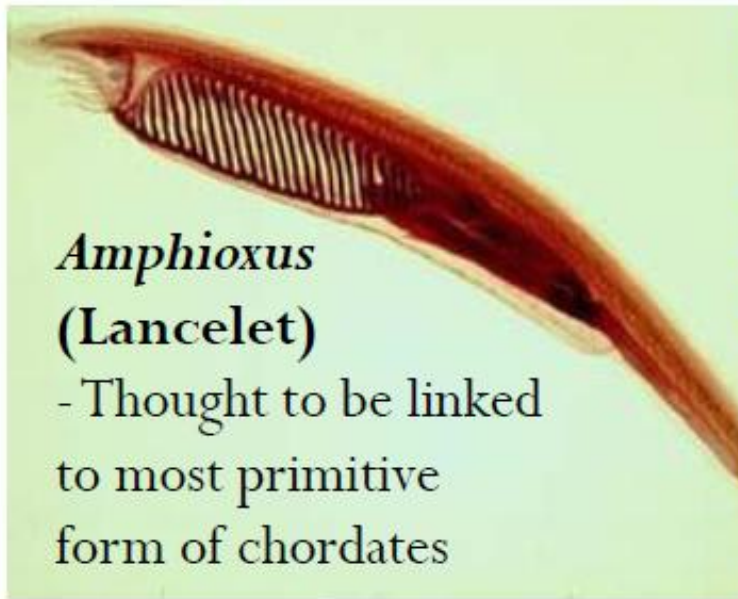
- Sea urchins



Phylum Chordata

- **Characterisitcs:**
 - Notochord (primitive spinal cord)

- Fish
- Amphibians
- Reptiles
- Birds
- Mammals



Amphioxus
(Lancelet)

- Thought to be linked to most primitive form of chordates



Questions

1. Animals, plants and fungi are all multicellular eukaryotes. What unifying characteristics distinguish animals from these two other kingdoms?
2. Use the following chart to organize each phyla according to: Body plan, germ layers, special characteristics and give 2 examples of each phyla

Annelids	Chordates	Rotifers	Arthropoda	Porifera	nematoda

3. Define the term “germ layer”. Describe the specialized tissue that arise from each of the germ layers.
4. How did the development of internal supporting skeleton help chordates conquer land?
5. Humans are just one of many species of animals. A) identify two characteristics that humans share with sponges b) identify 6 characteristics humans share with reptiles. D) identify two characteristics found only in humans and other mammals