



# CHAPTER 9

## Sponges, Cnidarians, and Worms



# Section 1: What is an animal?

- Multicellular that feed on other organisms
- STRUCTURE- levels of organization of cells
  1. **Cells**- basic unit of animal structure
  2. **Tissues**- many cells make up a particular tissue  
Example- bone, muscle, nerve
  3. **Organ**- group of different tissues  
Thigh bone contains bone, nerve, and blood tissue
  4. **Organ Systems**- group of organs working together  
Humans have 11 body systems

- FUNCTIONS of ALL animals:

1. Obtain food and oxygen
2. Keep internal conditions stable
3. Move
4. Reproduce

- Animals are able to perform these functions because of particular **ADAPTATIONS**

- Behavior or physical characteristic that allows organism to survive

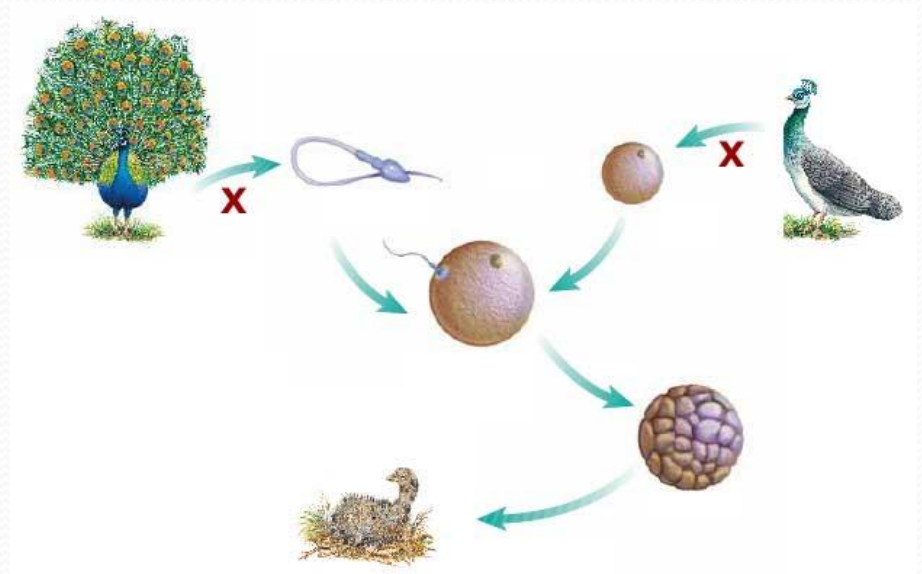


Special Adaptations

- The lion's archetypal roar is used to communicate with other group members and warn intruders of territorial boundaries.
- Long, retractable claws help the lion to grab and hold prey.
- The species' rough tongue helps it to peel the skin of prey animals away from flesh and flesh away from bone.
- Loose belly skin allows the African lion to be kicked by prey with little chance of injury.

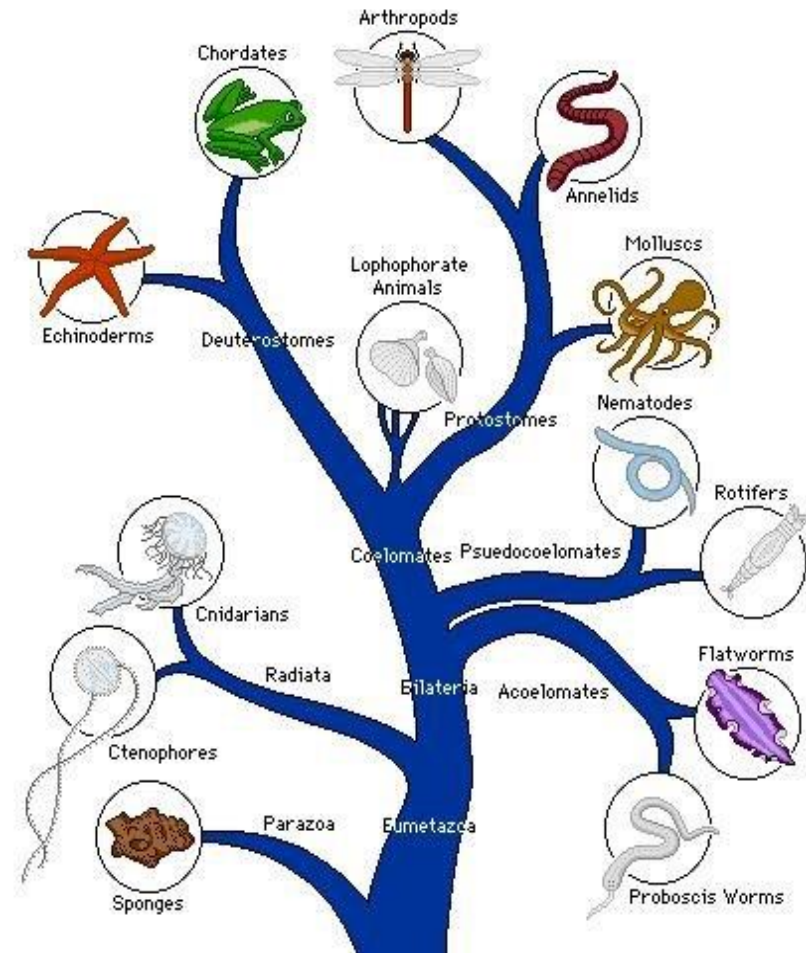
# Reproduction

- Sexual Reproduction
  - two sex cells- sperm and egg
  - Fertilization- joining of the two cells
- Asexual Reproduction
  - Single organism produces identical offspring
  - EX: Sea Anemones



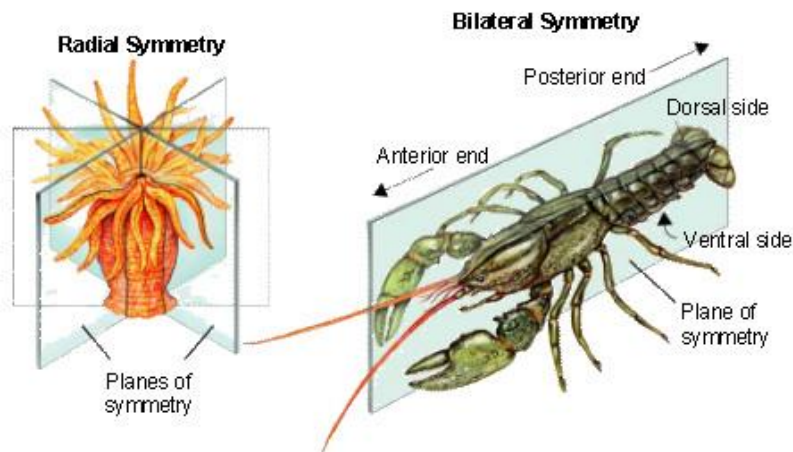
# Classification of Animals

- 1.5 million species
- 35 major phyla
- Classified according to THREE criteria:
  - Body structure
    - **Vertebrate**- with backbone
      - 1 phylum
    - **Invertebrate**- *without* backbone
      - 97% of animal kingdom
  - Development throughout the life cycle
  - DNA



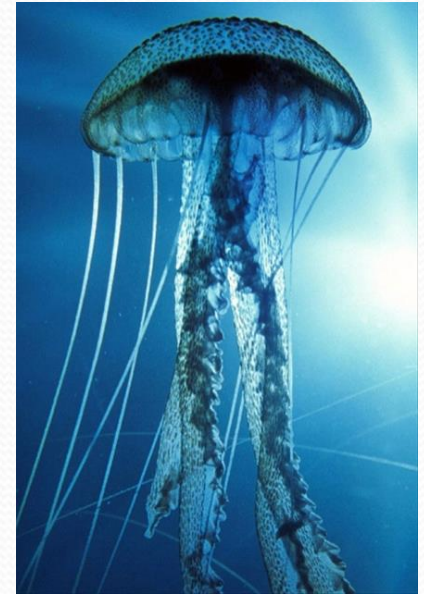
# Section 2: Animal Symmetry

- Symmetry- balanced arrangement of parts
- Types of symmetry:
  - Bilateral symmetry
    - One line that divides an object into mirror-like halves
  - Radial symmetry
    - Have many lines that all go through one central point



# Animals with Radial Symmetry

- Sea stars, jellyfishes, sea urchins
- **No** distinct front or back ends
- *All live in water*
- Do not move very fast
  - Some stay in one spot
  - Others creep along the bottom
  - Some moved by water currents



# Animals with Bilateral Symmetry

- *True front and back ends*
- Larger and more complex than radial sym organisms
- Streamlined body for quicker movement
- Sense organs in front end
- Adaptations to obtain food and avoid enemies





# Section 3: Sponges and Cnidarians

- Sponges

- Found in oceans, freshwater lakes and rivers
- Adults are attached to hard surfaces underwater
- Water currents responsible for:
  - Carrying food and oxygen to sponge
  - Taking away waste products
  - Reproduction and offspring transport



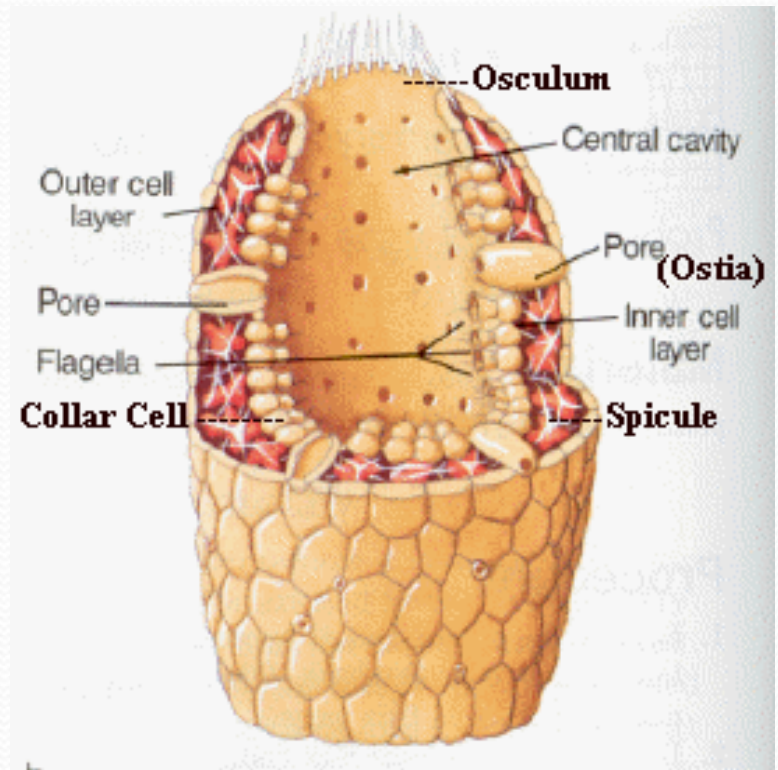
# Sponge- Body Structure

- Invertebrates with **no** body symmetry
- **No tissues or organs**
- Belong to phylum Porifera (“having pores”)
  - Pores for material transport
- Spikes to support soft body + defend against predators



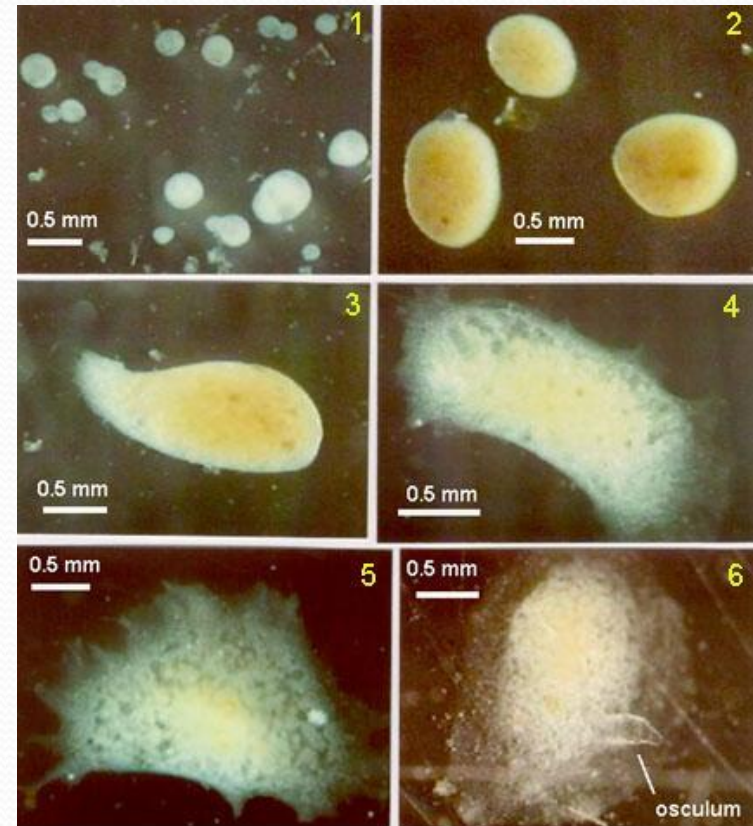
# Obtaining Food and Oxygen

- Eat single-celled organisms by filtering water that passes through them
- Collar cells line the central cavity and trap food
- Jelly-like cells digest the food



# Reproduction

- Able to reproduce both asexually and sexually
- Asexual by budding
- Sexual- no opposite sexes
  - One sponge can produce both sperm and egg cells
  - Sperm cells released into water and float into another sponge where the eggs are fertilized
  - Larva develops
    - Immature form of animal that looks very different from adult



Reaggregation of cells and tissue in a disintegrated freshwater sponge. Small reaggregated masses coalesce into large spheres (panels 1&2). By one week, spheres flatten out and attach to substrate (panels 4-6).

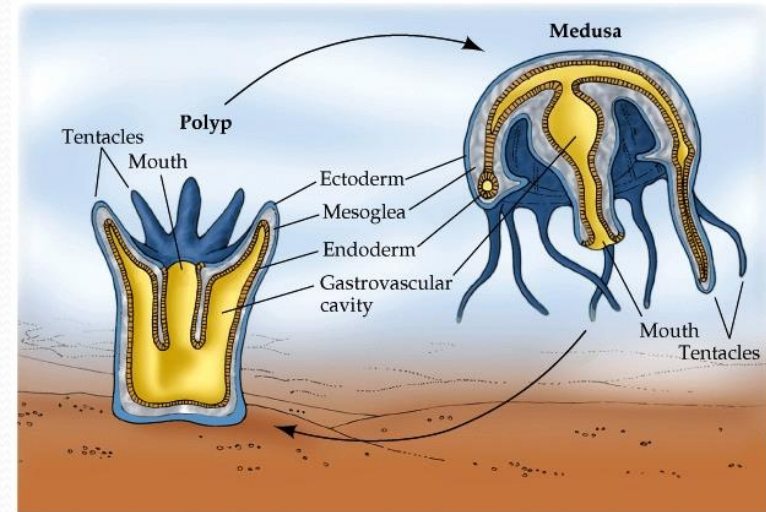
# Cnidarians

- Jellyfishes, corals, and sea anemones
- Invertebrates with stinging cells to:
  - Capture food and bring into central cavity
  - Defend themselves
- Obtaining Food
  - Use stinging cells to obtain food
  - Use tentacles to pull prey into its mouth



# Cnidarians- Body Structure

Characteristic	POLYP	MEDUSA
Radial symmetry	YES	YES
Central Hollow Cavity	YES	YES
Tentacles with stinging cells	YES	YES
Body plan	Vase-shaped	Bowl-shaped
Structure location	Mouth open at top	Mouth opens downward
Example	Sea anemone	jellyfish



# Movement and Reproduction

- Cnidarians can move to escape danger and get food
  - Jellyfishes swim
  - Hydras turn slow somersaults
  - Sea anemones stretch out, shrink down and bend slowly
- Movement directed by nerve cells
- Reproduce both asexually and sexually
  - Asexual by budding
  - Two ways of sexual:
    - One organism with two sexes
    - Individuals of each sex

# Life in a Colony

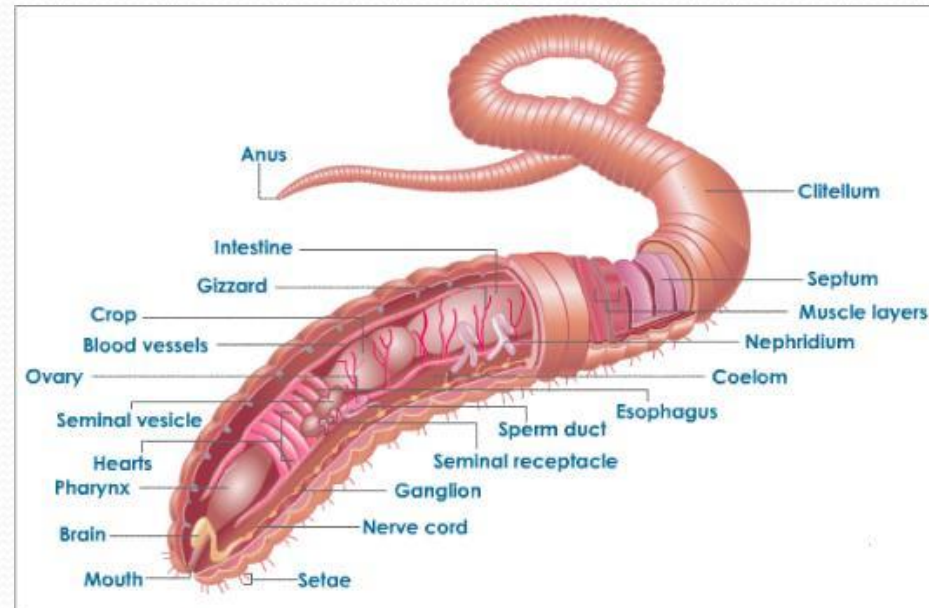
- Colony
  - group of many individual animals living together
- Examples:
  - Stony Corals form a coral reef
  - Portuguese Man-of-War
    - Contain as many as 1,000 individuals functioning as one unit





# Section 4: Worms

- Invertebrates with long bodies and no legs
- Bilaterally symmetrical
- Have brains- knot of nerve tissue at head end
- Can reproduce either asexually or sexually
  - Asexual by:
    - Having both sex organs
    - Breaking into pieces
  - Sexual by fertilizing eggs



# Classification of Worms

- Divided into 3 major phyla:
  - Flatworms (Platyhelminthes)
  - Roundworms (Nematoda)
  - Segmented worms (Annelida)



# Platyhelminthes- Flatworms

- Flat and soft as jelly
- Tapeworms, planarians, flukes
- Size- microscopic up to 10-12 meters long
- Some act like parasites living off of host organisms
- Rarely kill hosts
- Some are free-living organisms (planarians)
  - Does not live in a host
  - Slide and glide in water or over rocks in ponds



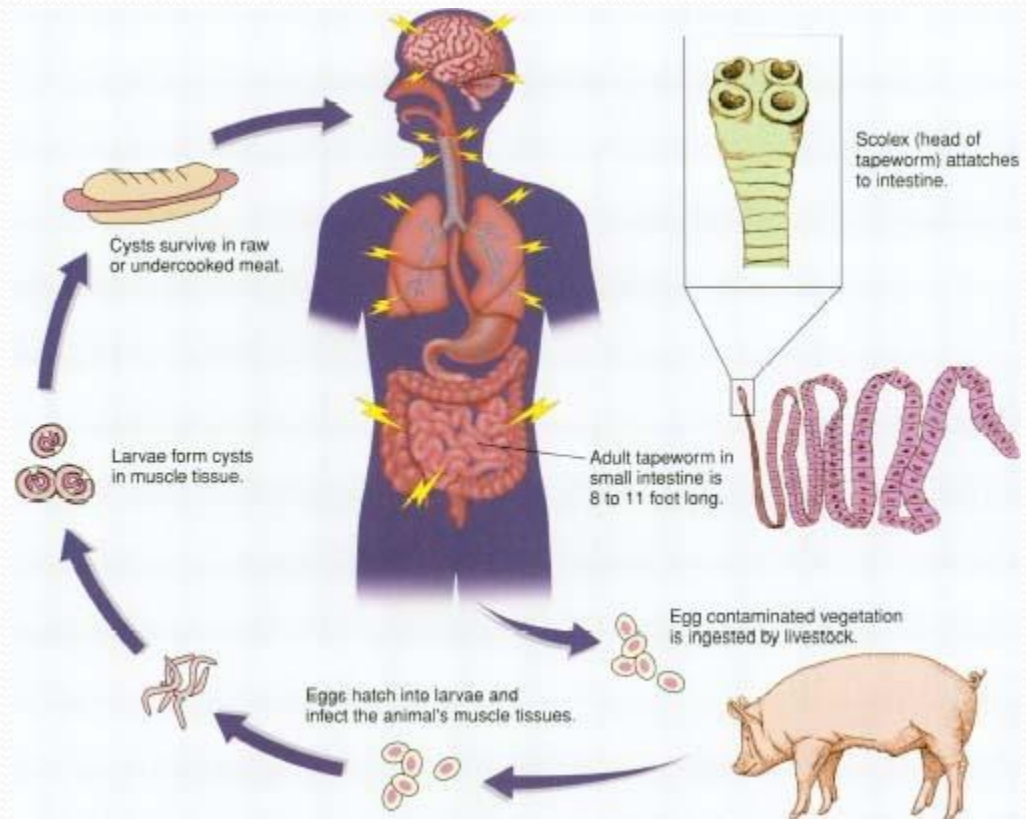
# Planarian



- Free-living flatworm
- Obtaining Food
  - Scavengers- feed on dead or decaying material
  - Will also attack smaller organisms
- Eat like vacuum cleaners
  - Glides onto food and slides a feeding tube into organism
  - Digestive juices release via tube and into organism
  - Break down food and then is sucked up into planarian
- Have eyespots to detect light and cells to pick up odors

# Tapeworms

- Parasitic flatworm
- Some able to live inside a human host
- Able to live in multiple hosts in a lifetime



# Nematoda- Roundworms

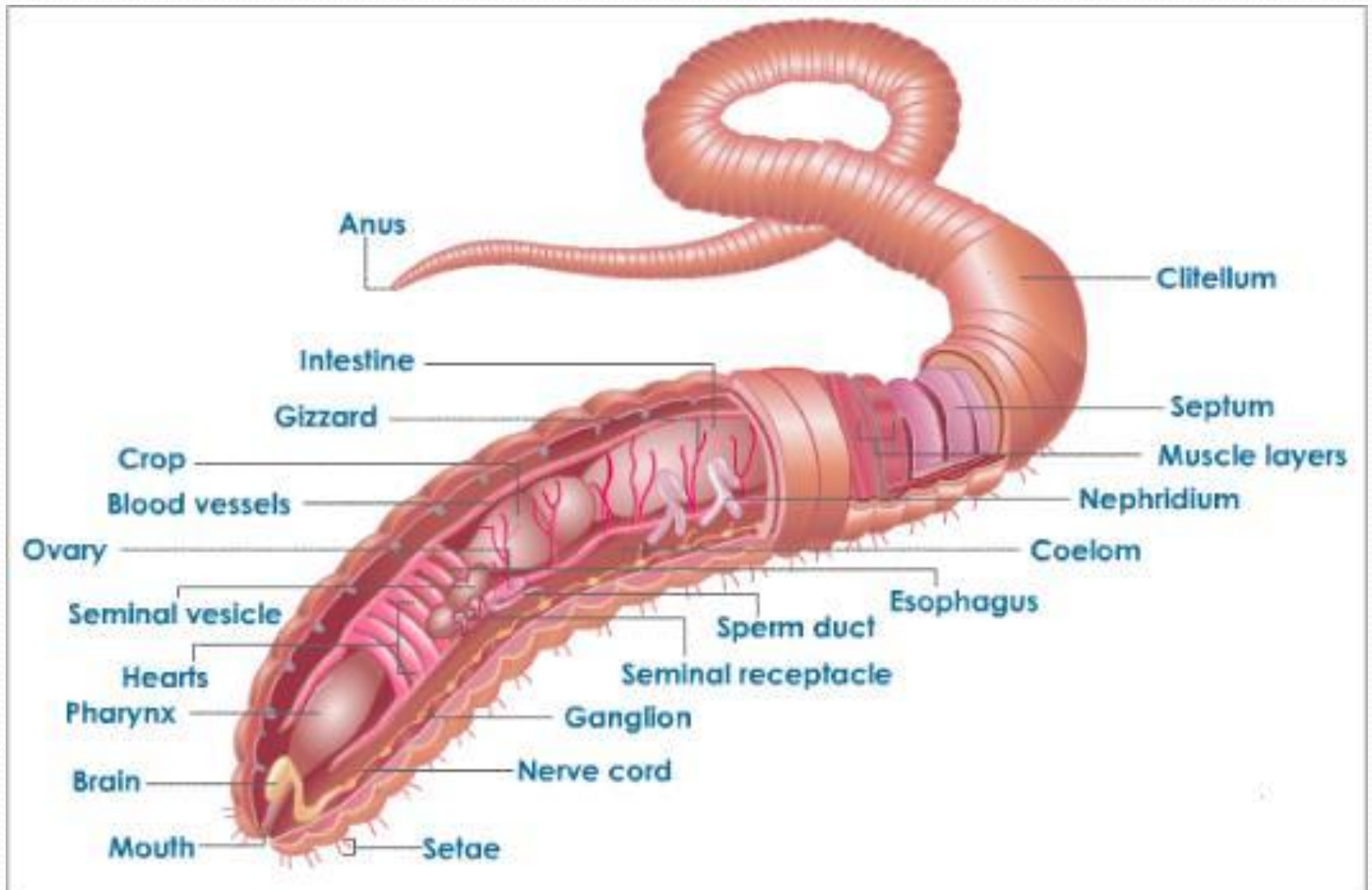
- Some free-living and some parasites
- Cylindrical bodies
- Efficient one-way Digestive system
  - a tube that opens at both ends
  - Food enters through mouth + exits through the anus
  - Process occurs in 3 orderly steps
    - Food broken down by digestive juices
    - Digested food is absorbed into animal's body
    - Wastes are eliminated



# Annelida- Segmented Worms

- Bodies are made up of linked sections called segments
- Contain nerve cord and digestive tube
- One-way digestive system with 2 openings
- Contain closed circulatory system
  - Blood moves only inside of blood vessels
  - Blood moves more quickly in this system

# Worm anatomy





# Earthworms

- Must live in a moist environment
  - Keeps the skin moist
  - Obtain oxygen from the moisture on the skin

