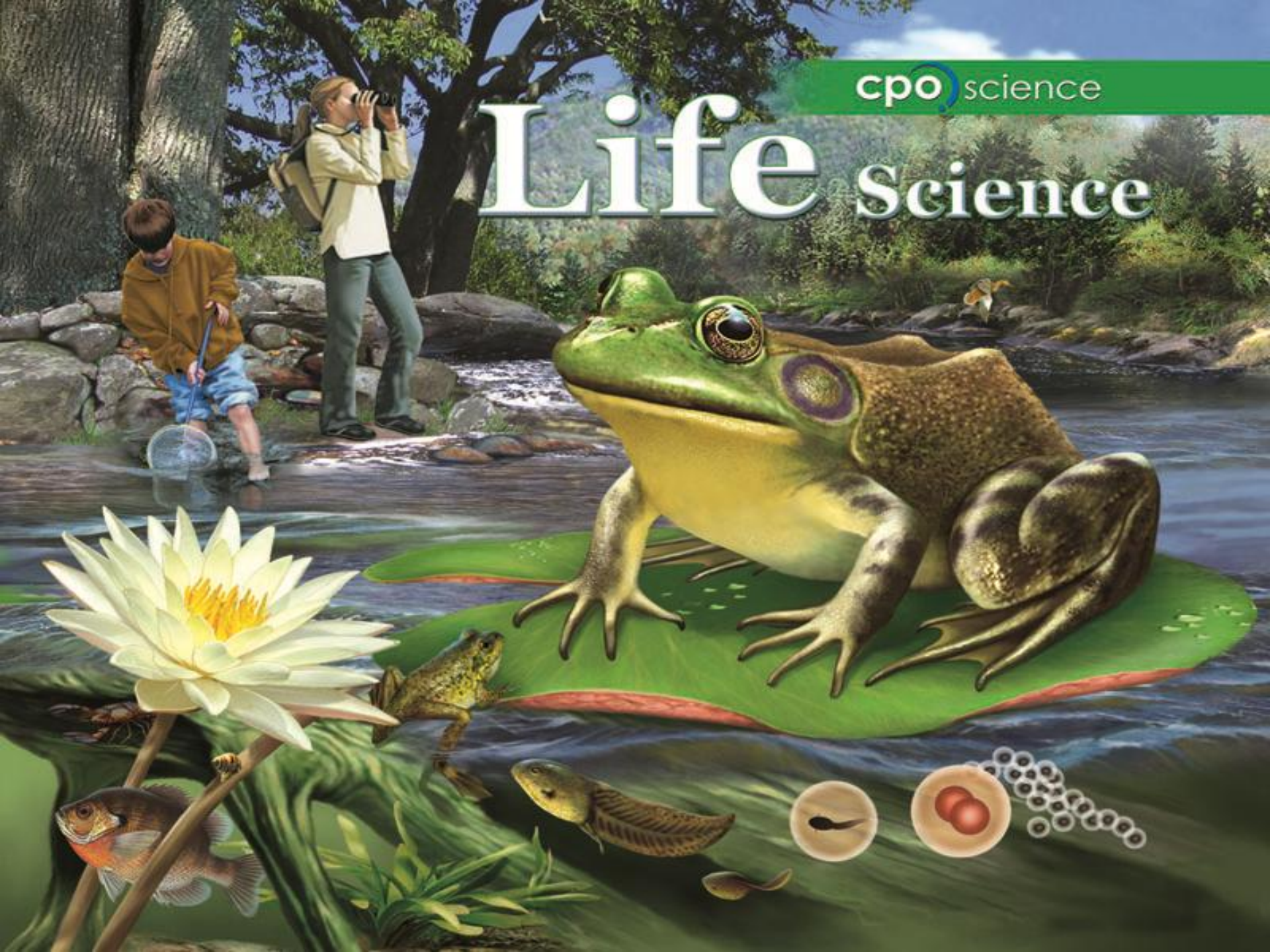

cpo science
Life science

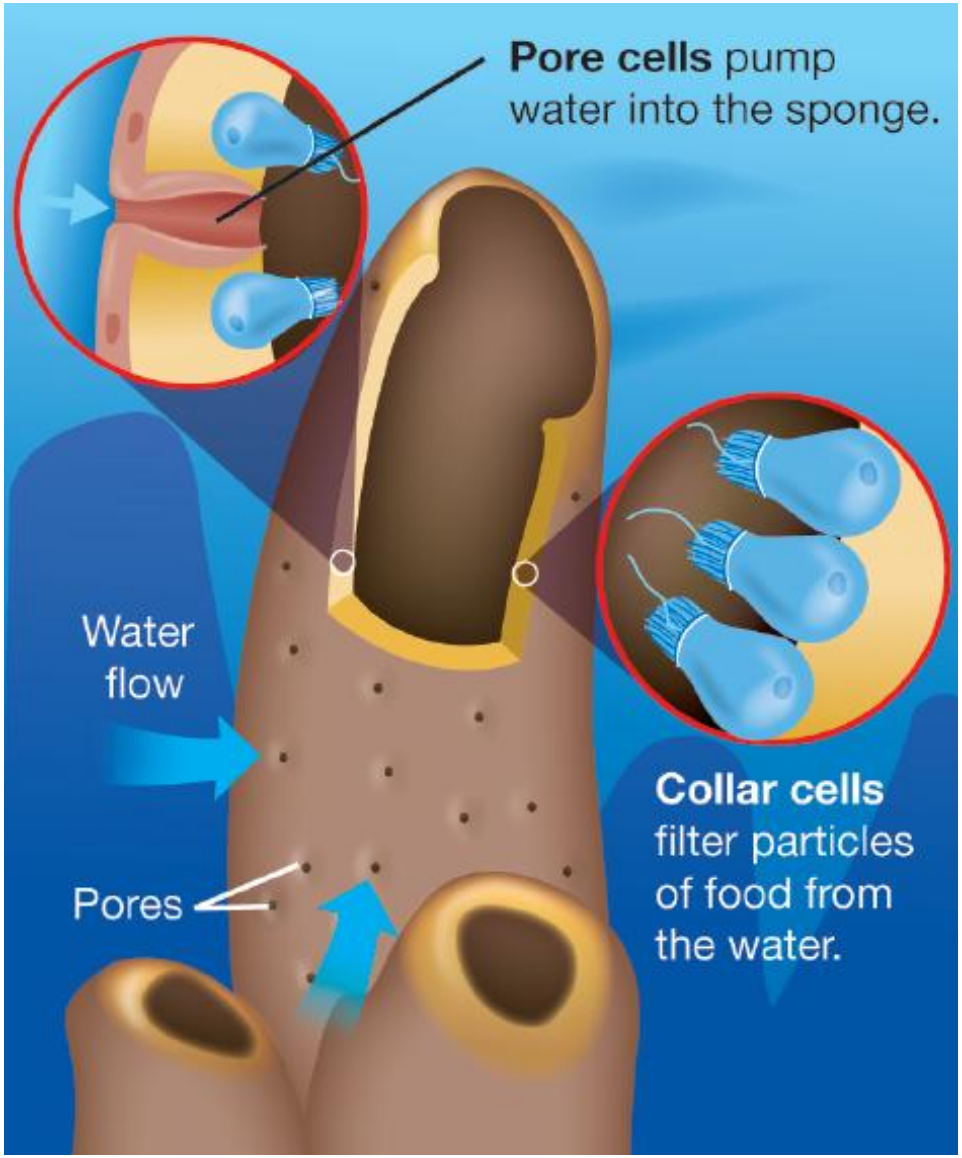
Structure and Function in Living Things

Chapter Seventeen: Animals

- **17.1 What is an Animal?**
- **17.2 Invertebrate Structure and Function**
- **17.3 Vertebrate Structure and Function**

17.2 Sponges

- Sponges belong to the *Phylum Porifera* (“pore bearing.”)
- They are asymmetrical and do not have a body cavity.



17.2 Sponges

- Adult sponges do not move around.
- They feed by pulling water into the pores of their bodies and filtering out food particles.
- They have specialized collar cells that move water and collect and digest food.

17.2 Cnidarians

- The *Phylum Cnidaria* includes jellyfish, coral, sea anemones, and hydra.
- They have radial symmetry and do not have a body cavity.

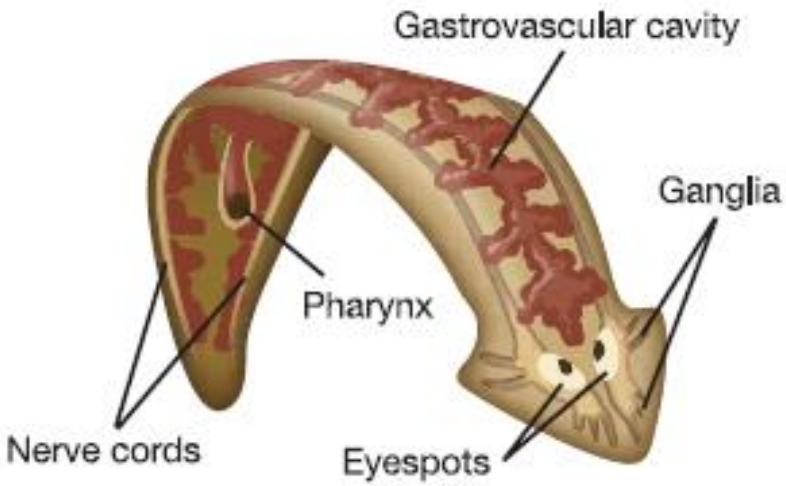
17.2 Cnidarians

- Cnidarians have differentiated cells that are organized into two layers of tissues and nerves that form a network.
- Many cnidarians have specialized stinging cells to capture food or defend themselves.

17.2 Flatworms

- Planarians belong to the *Phylum Platyhelminthes*—the flatworms.
- Flatworms are the simplest animals having bilateral symmetry.
- They have a sac-like gut but no body cavity.

17.2 Flatworms



What other organ system is shown?

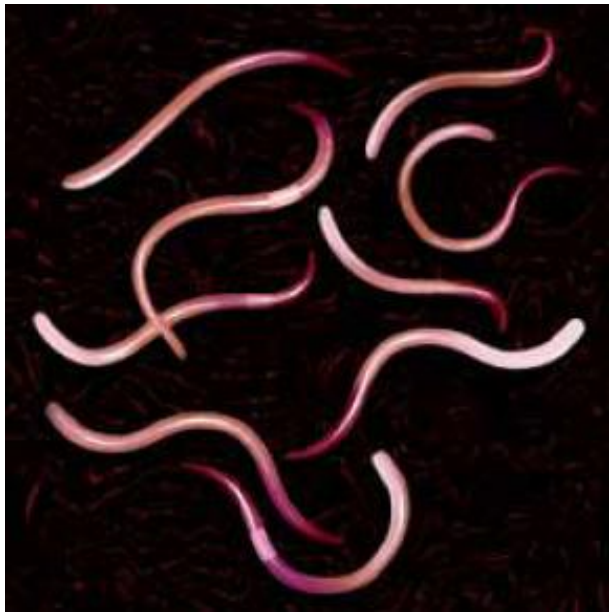
- Planarians secrete digestive enzymes onto their food and suck the food particles through an organ called a **pharynx**.
- They digest food in a *gastrovascular cavity*.

17.2 Roundworms

Roundworms are bilateral with a primitive body cavity.

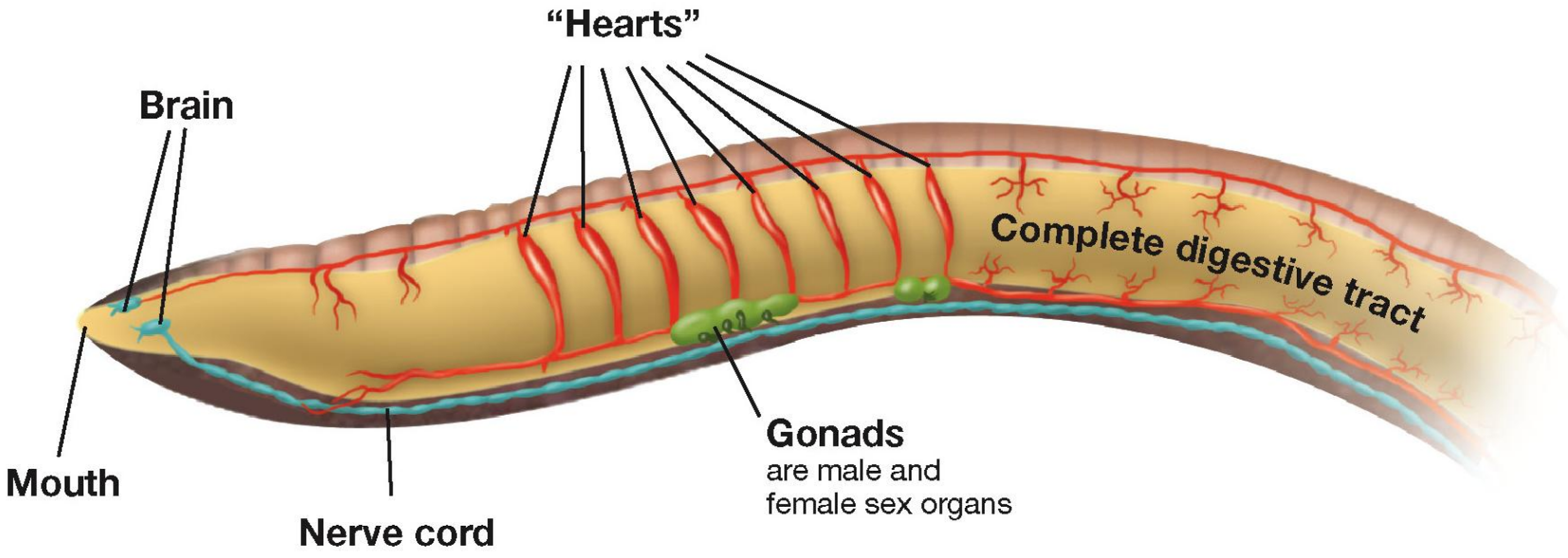
- Members of the *Phylum Nematoda* are called roundworms.
- Roundworms are the simplest animals with a complete gut that runs from mouth to anus.

17.2 Annelids



- Earthworms belong to the *Phylum Annelida.*
- All annelids have bodies that are divided into individual segments.
- Annelids have bilateral symmetry and a true body cavity.

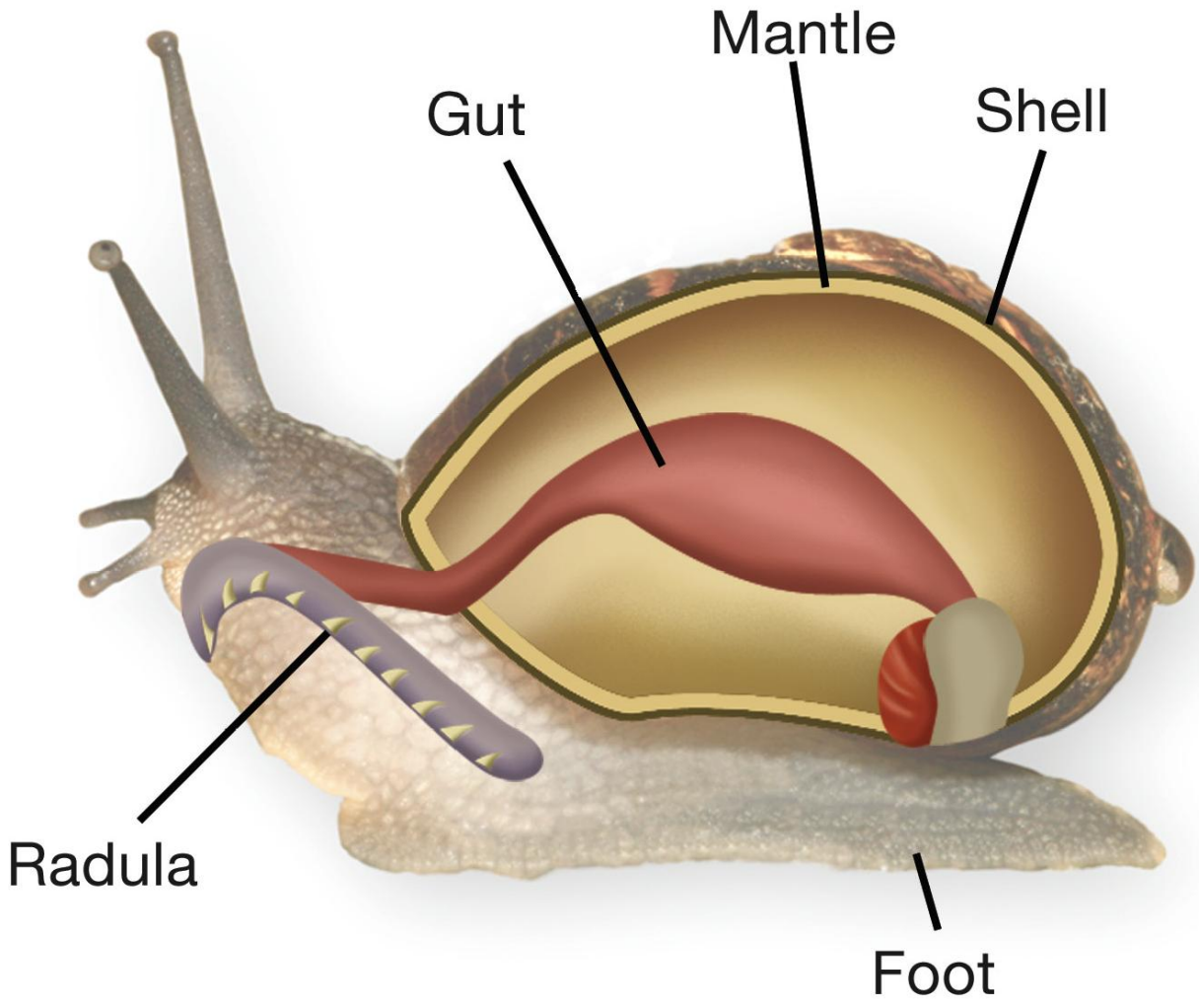
Earthworm Anatomy



17.2 Mollusks

- Snails, clams, and squids are all members of the *Phylum Mollusca*.
- Mollusks have bilateral symmetry and a true body cavity.
- The body of a mollusk typically has a *foot*, *gut*, **mantle**, and *shell.*

Mollusk Body



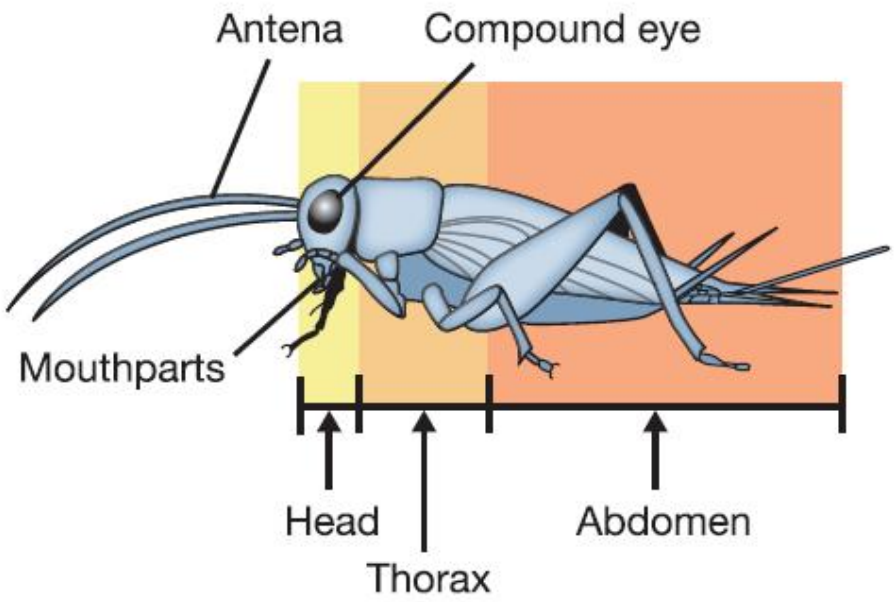
17.2 Mollusks

- Clams and their relatives have a simple nervous system with nerve cords and a few ganglia.
- Octopi and their relatives have a more advanced nervous system.
- An octopus has a well-developed brain and eyes.
- Most mollusks have a sense of touch and taste.

17.2 Arthropods

- The *Phylum Arthropoda* includes insects, spiders, and crustaceans such as lobsters and crabs.
- Arthropods have segmented bodies, jointed limbs, an **exoskeleton**, and well-developed organ systems.

17.2 Arthropods

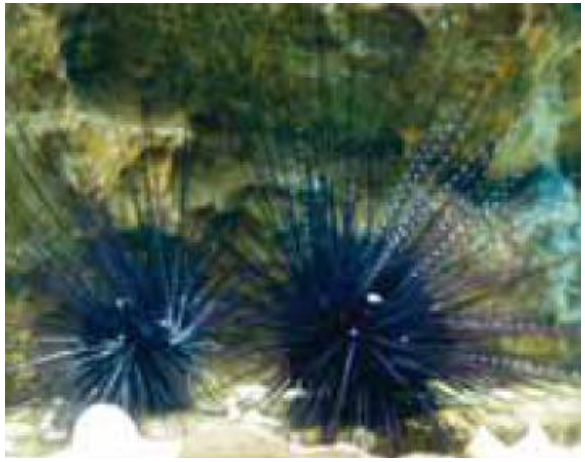


- Like annelids, arthropod bodies are segmented.
- Some segments form three distinct regions: a *head*, a *thorax*, and an *abdomen*.

17.2 Arthropods

- Arthropods are the most successful animals on Earth.
- The first arthropod was the **trilobite**.
- Trilobite fossils have been dated at about 400 million years old!

17.2 Echinoderms



- The *Phylum Echinodermata* (meaning “spiny skin”) includes starfish, sea urchins, and sea cucumbers.
- Echinoderms have radial symmetry, a body cavity, an internal skeleton, and spiny skin.

17.2 Echinoderms

- Echinoderms have a specialized **water vascular system**.
- The water vascular system is a network of fluid-filled canals connected to hundreds of tiny, tube-like feet.
- The water vascular system helps them move and capture food.

Evolution of Animal Phyla