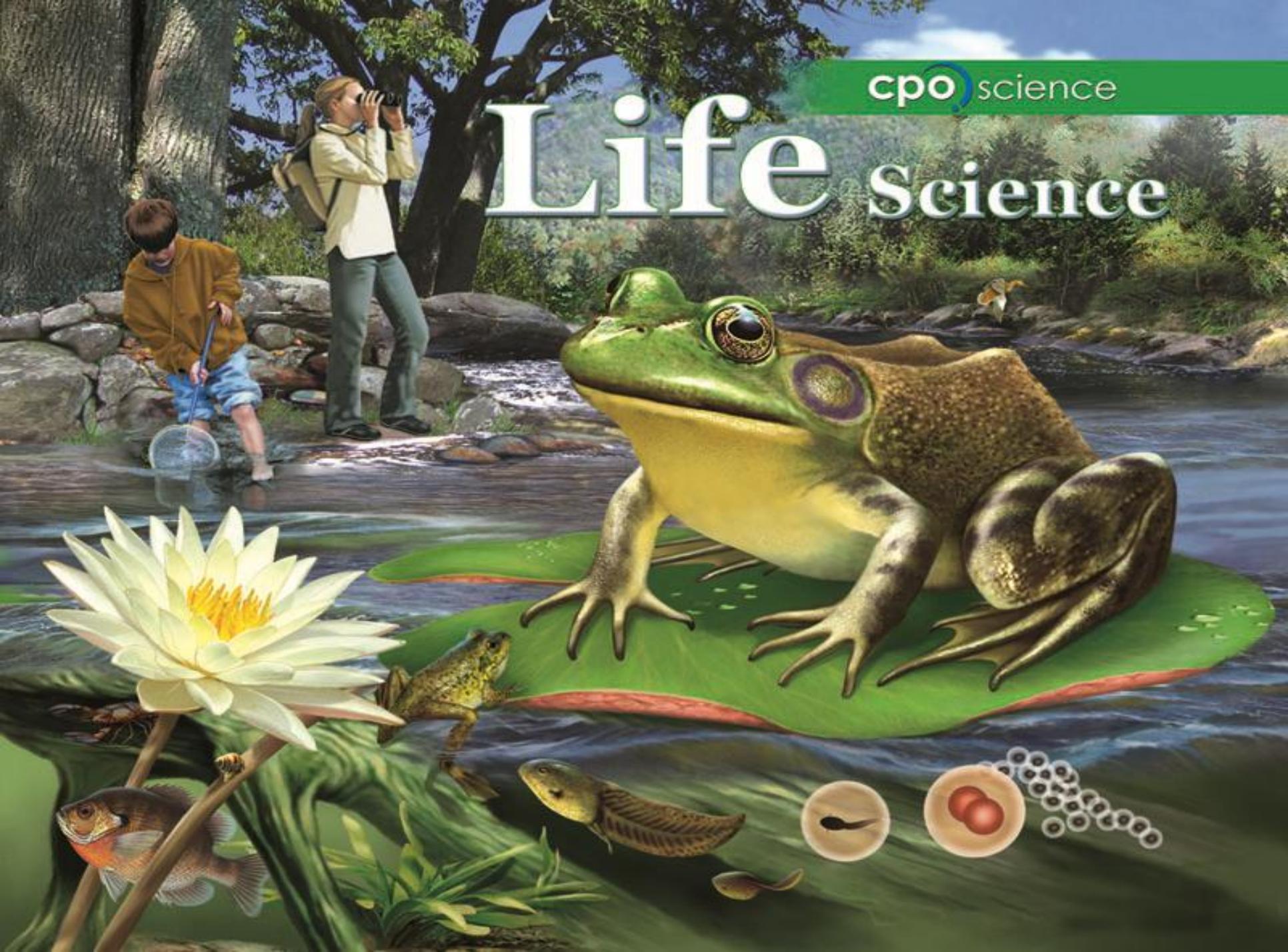


cpo science

Life Science





UNIT
6

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**

17.1 What is an animal?

- Scientists divide the **Kingdom Animalia** into two major groups:
 - invertebrates
 - vertebrates



**Which organisms
are invertebrates?**

17.1 What is an animal?

- An **invertebrate** is an animal without a backbone.
- About 98 percent of all animals are invertebrates.

Phylum	Estimated number of species	Phylum	Estimated number of species	Phylum	Estimated number of species	Phylum	Estimated number of species
Sponges 	10,000	Flatworms 	25,000	Mollusks 	110,000	Arthropods 	1,000,000
Cnidarians 	9,500	Roundworms 	80,000	Annelids 	9,000	Echinoderms 	6,000

17.1 What is an animal?

- Only about two percent of all animals are **vertebrates** which belong to the *Phylum Chordata*.
- Vertebrates include fish, amphibians, reptiles, birds, and mammals.

Phylum	Estimated number of species
Vertebrates (Phylum chordata)	50,000



The illustration shows a man in a red jacket and black shorts standing next to a large yellow and blue parrot, a green tree frog, and a grey rabbit, all of which are vertebrates.



17.1 Characteristics of animals

- Animals share the following characteristics:
 1. **Animals are multicellular and have eukaryotic cells.**
 2. **Animal cells lack cell walls.**
 3. **Animals have a period of embryonic development.**
 4. **Animals are consumers.**
 5. **Animals can move.**
 6. **Most animals have muscle and nervous tissue.**
 7. **Animals are diploid.**

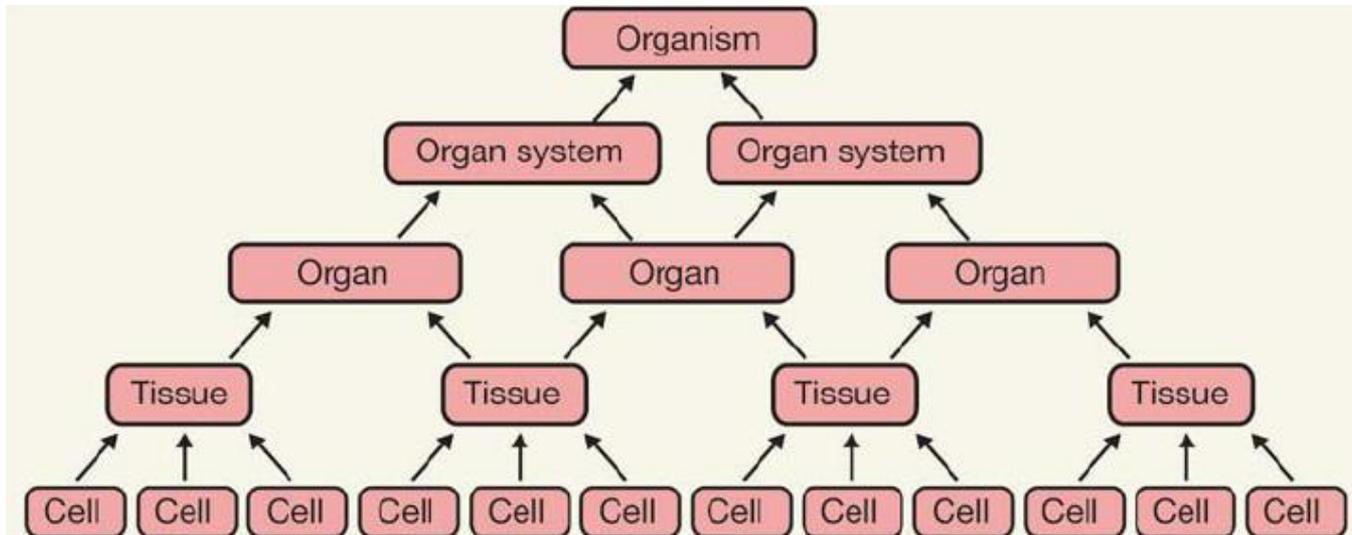
Animal Phyla

Phylum	Estimated number of species	Phylum	Estimated number of species	Phylum	Estimated number of species
Sponges 	10,000	Flatworms 	25,000	Mollusks 	110,000
Cnidarians 	9,500	Roundworms 	80,000	Annelids 	9,000

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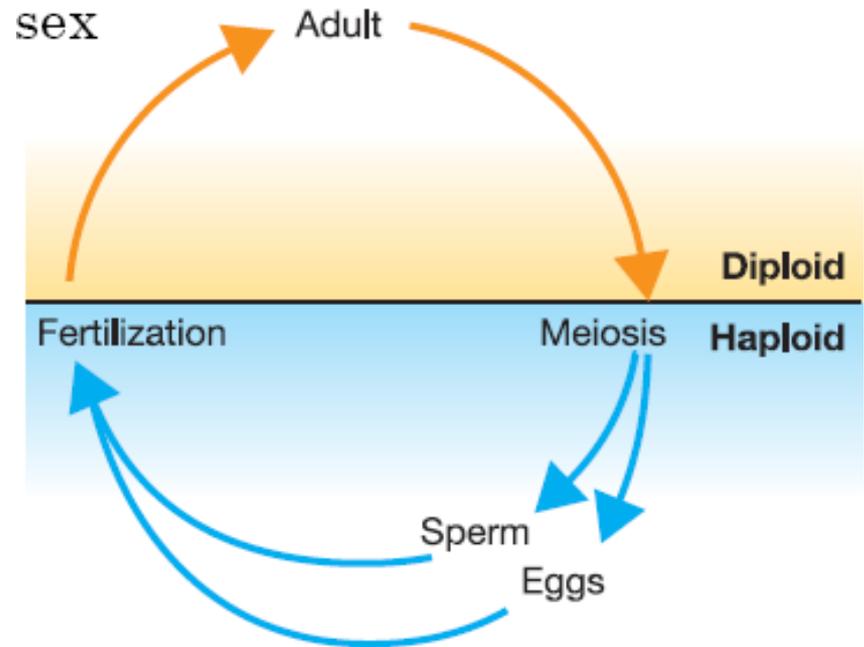
17.1 Characteristics of animals

- Animals have different levels of organization.
- Some animals consist of cells with a few tissue layers.
- Others are complex with organ systems.



17.1 Characteristics of animals

- All animals have sex cells that are haploid and are produced by meiosis.
- All animal life cycles consist of haploid and diploid cell development.



17.1 Animal body plan and symmetry

- The arrangement of an animal's body parts is called its **symmetry**.
- Animals that do not have an orderly body plan, like sponges, are called **asymmetrical**.
- **Radial symmetry** means that the body parts are arranged in a circle around a central point.
- In **bilateral symmetry**, the body consists of two similar halves.

Symmetry

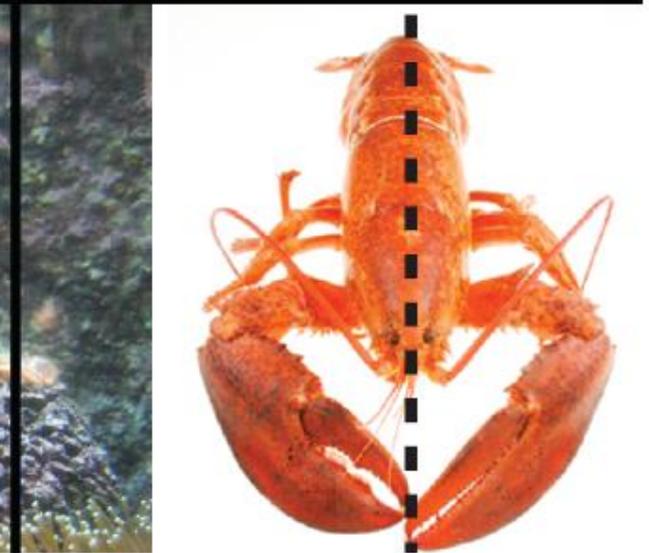
Types of symmetry



Asymmetrical



Radial



Bilateral

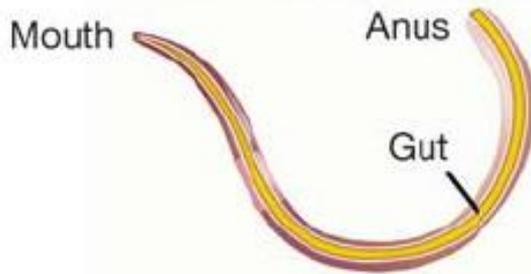
17.1 Animal body plan and symmetry

Planaria Sac-like gut



- The **gut** is the digestive tract.
- It enables an animal to digest food outside of its cells.

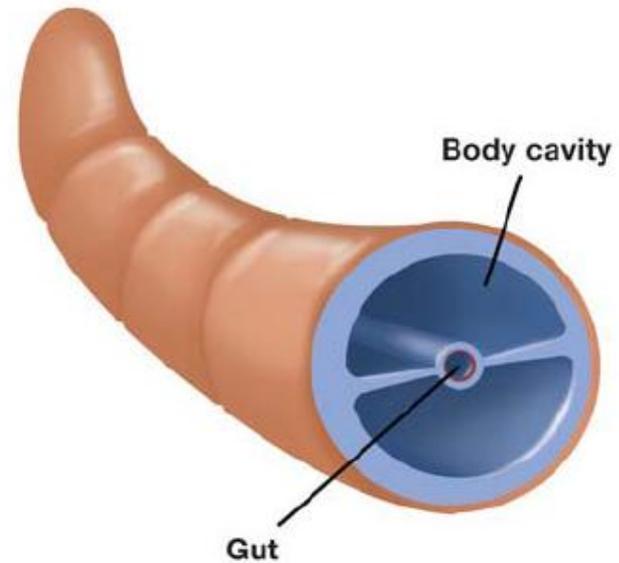
Earthworm Complete gut



- In animals without a gut (like sponges), food is digested inside of their cells.

17.1 Animal body plan and symmetry

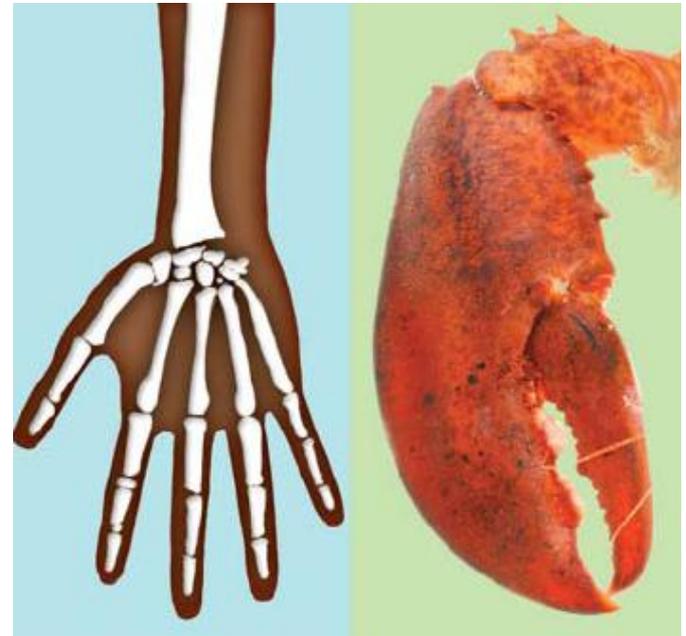
- Complex animals also have a **body cavity** that holds the gut and other organs.
- The body cavity provides an open space for organs to grow and function.



17.1 Organ Systems

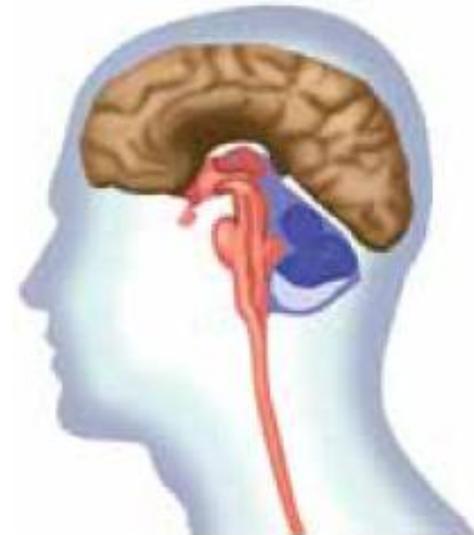
- As animals evolved and became more complex, they developed organ systems to perform basic functions.

Can you name some organ systems found in animals?



17.1 Organ Systems

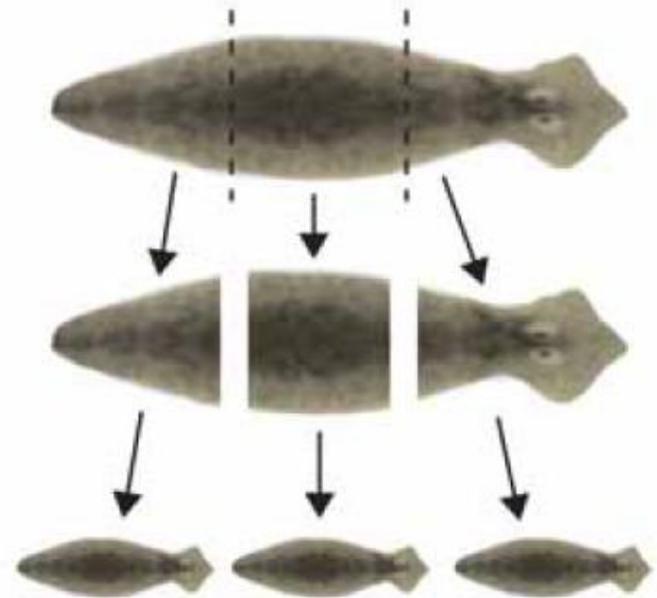
- Some important organ systems are:
 - skeletal
 - muscular
 - circulatory
 - digestive
 - nervous
 - reproductive



To what system do these organs belong?

17.1 Organ systems

- Planarians have the unique ability to **regenerate** or grow back parts that have been separated from the original worm.
- A single worm can be cut into several pieces, each of which grows into a complete worm.



Investigation 17A

Observing Planarians

- *What are the structures and behaviors of planarians?*

