

Animal Characteristics

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CHAPTER 1

Animal Characteristics

- Draw an animal cell and label significant structures.
- Identify characteristics common to all animals.
- Describe the basic animal life cycle.



Is an insect an animal?

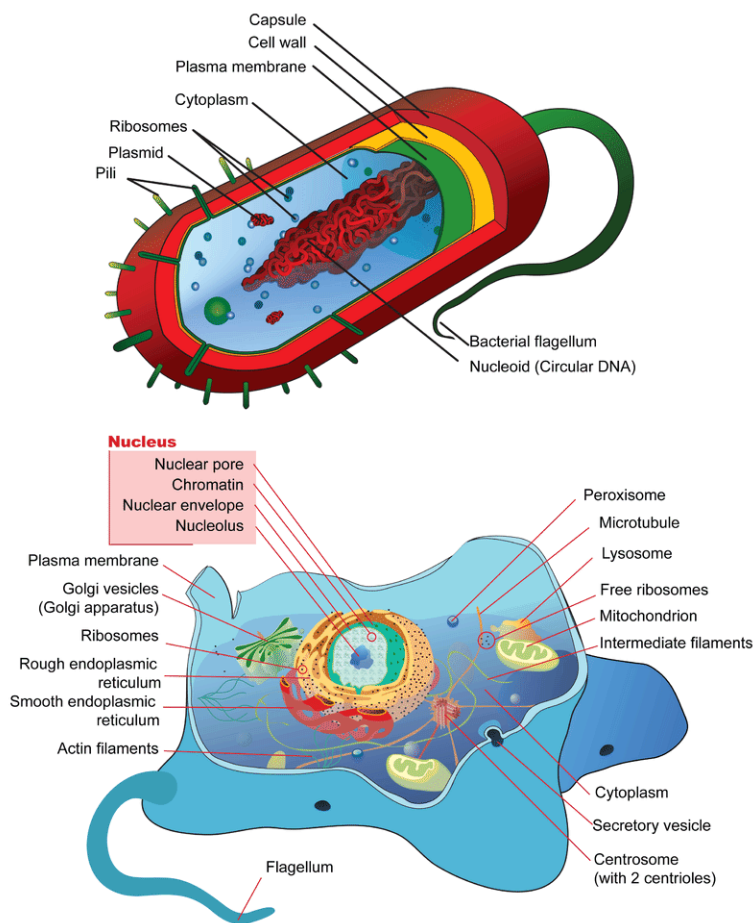
Of course it is. Is a snail an insect? No, snails are mollusks. Notice the large "foot" that allows movement, and the antennas are obvious. Actually, a snail's eyes are on the two long projections on its head, and the projections are called eyestalks. These are characteristics of this animal.

Characteristics of Animals

Animals are a kingdom of multicellular eukaryotes. They cannot make their own food. Instead, they get nutrients by eating other living things. Therefore, animals are **heterotrophs**.

Animal Cells

Like the cells of all eukaryotes, animal cells have a nucleus and other membrane-bound organelles (see **Figure 1.1**). Unlike the cells of plants and fungi, animal cells lack a cell wall. This gives animal cells flexibility. It lets them take on different shapes so they can become specialized to do particular jobs. The human nerve cell shown in **Figure 1.2** is a good example. Its shape suits its function of transmitting nerve impulses over long distances. A nerve cell would be unable to take this shape if it were surrounded by a rigid cell wall.

**FIGURE 1.1**

Animal Cell. The shape of an animal cell is not constrained by a rigid cell wall. A bacterial cell is shown above for comparison.

Animal Structure and Function

Animals not only have specialized cells. Most animals also have tissues and organs. In many animals, organs form organ systems, such as a nervous system. Higher levels of organization allow animals to perform many complex functions. What can animals do that most other living things cannot? Most animals share these characteristics: **sensory organs**, **movement**, and **internal digestion**. All of them are illustrated in **Figure 1.3**.

- Animals can detect environmental stimuli, such as light, sound, and touch. Stimuli are detected by sensory nerve cells. The information is transmitted and processed by the nervous system. The nervous system, in turn, may direct the body to respond.
- All animals can move, at least during some stage of their life cycle. Muscles and nerves work together to allow movement. Being able to move lets animals actively search for food and mates. It also helps them escape from predators.
- Virtually all animals have internal digestion of food. Animals consume other organisms and may use special tissues and organs to digest them. (Many other organisms absorb nutrients directly from the environment.)

Animal Life Cycle and Reproduction

Many animals have a relatively simple life cycle. A general animal life cycle is shown in **Figure 1.4**. Most animals spend the majority of their life as diploid organisms. Just about all animals reproduce sexually. Diploid adults

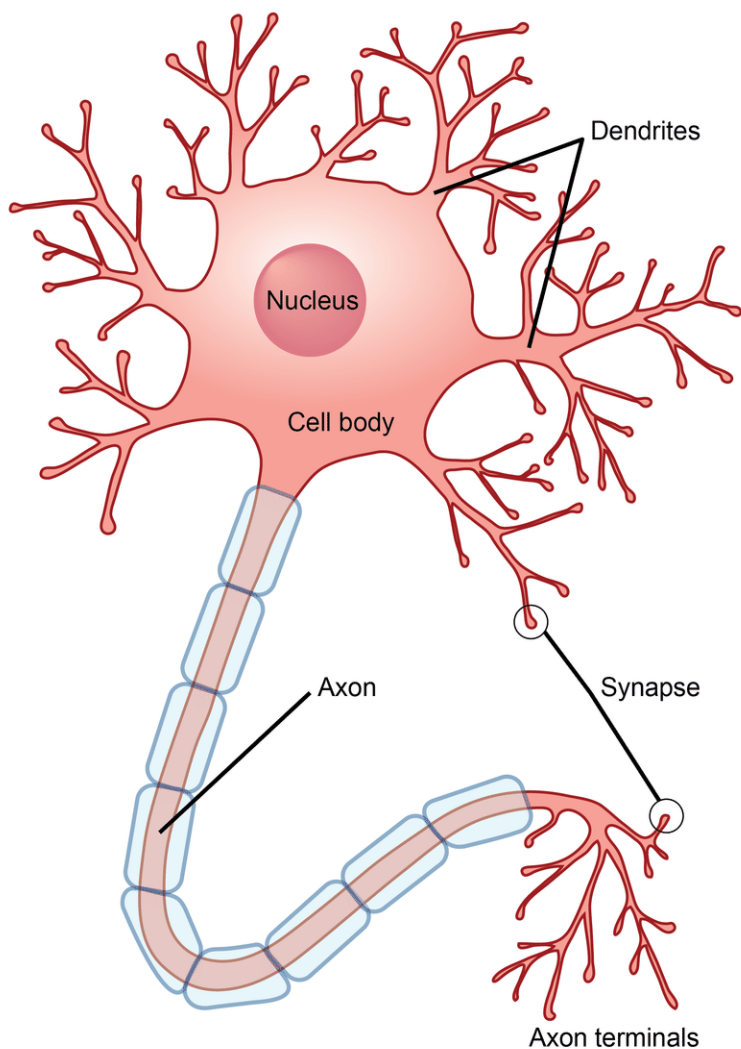


FIGURE 1.2

Human Nerve Cell. A human nerve cell is specialized to transmit nerve impulses. How do you think the cell's shape helps it perform this function?

undergo meiosis to produce sperm or eggs. Fertilization occurs when a sperm and an egg fuse. The zygote that forms develops into an embryo. The embryo eventually develops into an adult.

Body Support

- Invertebrates = exoskeletons
 - Hard/tough outer coverings that provide a framework of support
- Vertebrates = endoskeletons
 - Support for the body
 - Internal brace for muscles to pull against




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Summary

- Animals are multicellular eukaryotes that lack cell walls.

Characteristics of Animals



Sensory Organs

Spiders have four pairs of eyes encircling their head. Some of the eyes form images. Some just detect the the direction of light. Certain spiders can even swivel their eyes to see in different directions.



Movement

Sea stars have hundreds of sucker-like tube feet for movement. Other animals move in a diversity of ways



Internal Digestion

Snakes swallow other animals whole and digest them internally. Notice how wide the snake must open its mouth.

FIGURE 1.3

Most animals share these characteristics: sensory organs, movement, and internal digestion.

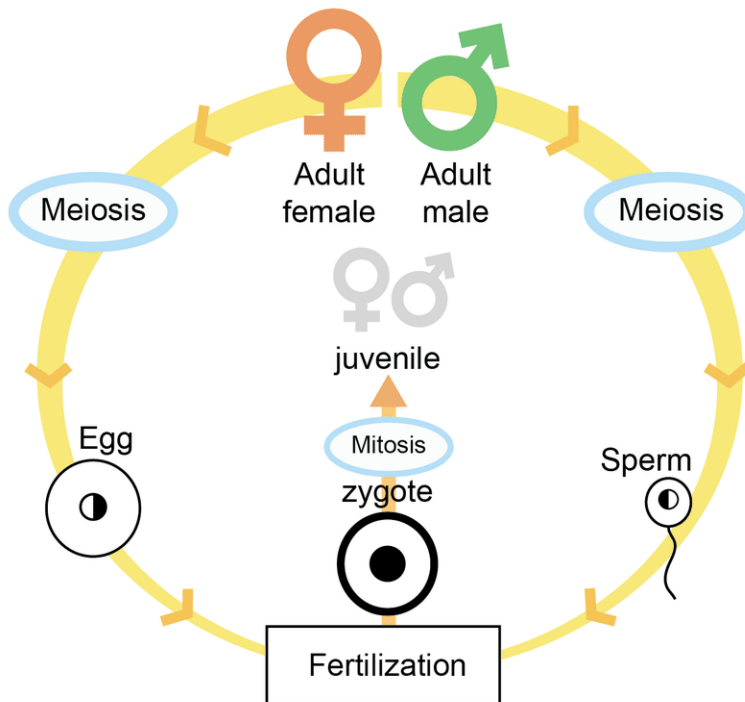


FIGURE 1.4

Animal Life Cycle. An animal life cycle that includes only sexual reproduction is shown here. Some animals also reproduce asexually. How does the animal life cycle compare with the life cycle of a plant?

- All animals are heterotrophs.
- Animals have sensory organs, the ability to move, and internal digestion. They also have sexual reproduction.

Review

1. Identify traits that characterize all animals.
2. State one way that animal cells differ from the cells of plants and fungi. What is the significance of this difference?
3. Describe animal digestion.
4. Describe a general animal life cycle.

References

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2. . . CC-BY-NC-SA 3.0
3. Top to bottom: Bryce McQuillan; Dr. James P. McVey, NOAA Sea Grant Program; Scott Oves. [Animal characteristics](#) . Top to bottom: CC BY 2.0; Public Domain; CC BY 2.0
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