

CHAPTER 14 Introduction to Animals

SECTION 1 **What Is an Animal?**



California Science Standards

7.1.f, 7.2.a, 7.5.a, 7.5.b, 7.5.c

BEFORE YOU READ

After you read this section, you should be able to answer these questions:

- What is an animal?
- What are the seven basic characteristics of animals?

STUDY TIP

List As you read, make a list of the characteristics of animals.

What Is an Animal?

What do you think of when you think of an animal? You may think of a cat or dog, or even a giraffe or bear. Would you think of a sponge?

Animals come in many shapes and sizes, but they all share certain characteristics. An *animal* is an organism that is made up of many cells and must eat food to get energy. Animals cannot make their own food as plants do.

What Are the Basic Characteristics of Animals?

1. ENERGY CONSUMPTION

All organisms need energy to survive. Unlike plants, animals must get energy from other organisms. They are consumers. A **consumer** is an organism that feeds on other organisms or parts of other organisms. Some animals, such as lions, eat other animals. Some, such as pandas, eat plants. Other animals, such as black bears, can eat both plants and animals. ✓



READING CHECK

1. Define What is a consumer?

Say It

Discuss With a partner, choose 10 different kinds of animals, and describe what they eat. Make a list to share with your classmates.

2. MOVEMENT

Nearly all animals move during some part of their lives, often in order to find food or shelter. Muscle cells help animals move. Groups of muscle cells work together. They contract and relax to help the animal move.

SECTION 1 What Is an Animal? *continued*

3. MULTICELLULAR MAKEUP

Like all organisms, animals are made of cells. Unlike plant cells, animal cells do not have cell walls. Animal cells are surrounded only by cell membranes.

All animals are *multicellular*. That means they are made of many cells. All of an animal's cells work together to perform important functions, such as breathing, digesting food, and reproducing. ✓

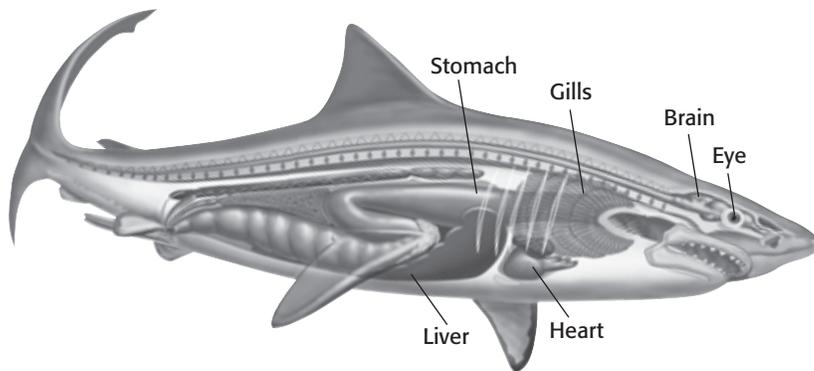
4. LEVELS OF ORGANIZATION

Animals have different levels of organization in their bodies. This means their bodies are organized into structures made of smaller structures. Cells are the first, or smallest, level of organization in an animal. ✓

Cells specialize to do specific jobs. Groups of cells that are of the same kind and that work together form tissues. For example, muscle cells form muscle tissue. Tissues are the second level of organization in animals.

Tissues work together to form an organ. The heart, lungs, and kidneys are all organs. Organs are the third level of organization.

Organs work together to form an organ system. An organ system is the fourth level of organization. The organism may die if any part of an organ system stops working.



Like most other animals, sharks have organs for digestion, circulation, and sensing the environment.

✓ **READING CHECK**

2. Define What does multicellular mean?

✓ **READING CHECK**

3. Identify What is the first level of organization in animals?

TAKE A LOOK

4. List Name four organ systems you can see in this picture.

SECTION 1 What Is an Animal? *continued*

Critical Thinking

5. Apply Concepts What kind of symmetry do you have?

5. BODY PLAN

A body plan is the general shape of an organism. One characteristic of a body plan is its symmetry. Animals can have three types of symmetry.



This tortoise has **bilateral symmetry**. The two sides of its body mirror each other. On each side of its body, the tortoise has one nostril, one eye, and two legs.



This sea star has **radial symmetry**. Its body is organized around the center, like spokes on a wheel.

TAKE A LOOK

6. Demonstrate Draw a line or lines on two of the pictures to show how you can divide each body into like parts.



This sponge is **asymmetrical**. You cannot draw a straight line to divide its body into two or more equal parts. You also cannot find a center point that its body is organized around.

Another characteristic of a body plan is whether or not it has a coelom. A **coelom** is a body cavity, or space, that surrounds and protects many organs, such as the heart. Many animals have coeloms. ✓

READING CHECK

7. Define What is a coelom?

6. CONTROLLED BODY TEMPERATURE

All animals need to keep their bodies within a range of temperatures. Birds and mammals do this by using the energy released by chemical reactions. These kinds of animals are called *endotherms*. Their body temperatures stay almost the same, even when the temperature of the environment changes.

The body temperatures of other animals change with the temperature of the environment. These kinds of animals are called *ectotherms*. Some of these animals have behaviors that help control their body temperatures. For example, some lizards sit in the sun to warm up.

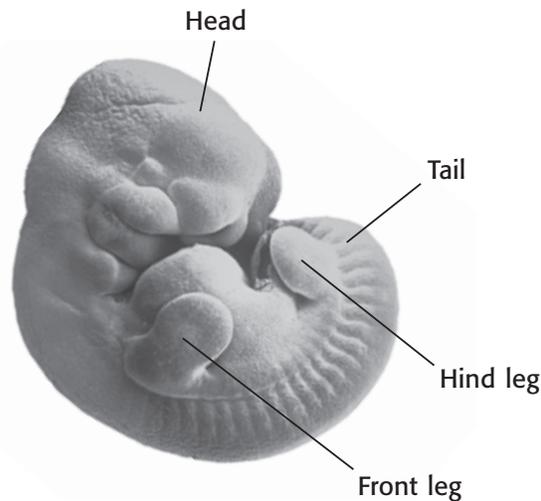
SECTION 1 What Is an Animal? *continued*

7. REPRODUCTION AND DEVELOPMENT

Animals make more animals through reproduction. In **asexual reproduction**, there is only one parent. All the offspring have the same genes as the parent. Some animals, such as the hydra, reproduce asexually by budding. In *budding*, part of an organism develops into a new organism. The new organism then breaks off from the parent. In *fragmentation*, parts of an organism break off and then develop into new organisms. ✓

In **sexual reproduction**, offspring form when genetic information from two parents combines. The female parent produces sex cells called *eggs*. The male parent produces sex cells called *sperm*. The first cell of a new organism forms when an egg's nucleus and a sperm's nucleus join. This process is called *fertilization*.

A fertilized cell divides into many cells to form an *embryo*. An embryo is an organism at an early stage of development, such as the mouse embryo below. As an animal develops, its cells become specialized through **differentiation**. In **differentiation**, cells develop different structures to do specific jobs. ✓



Cells in the mouse embryo will differentiate as the mouse develops. These cells will produce skin, muscles, nerves, and all the other parts of the mouse's body.

✓ **READING CHECK**

8. Identify What are two ways some animals can reproduce asexually?

✓ **READING CHECK**

9. Explain What happens to the cells in an embryo as the embryo develops?

Section 1 Review

7.1.f, 7.2.a, 7.5.a, 7.5.b, 7.5.c 

SECTION VOCABULARY

<p>asexual reproduction reproduction that does not involve the union of sex cells and in which one parent produces offspring that are genetically identical to the parent</p> <p><u>Wordwise</u> The prefix <i>a-</i> means “not.”</p> <p>coelom a body cavity that contains the internal organs</p> <p>consumer an organism that eats other organisms or organic matter</p>	<p>differentiation the process in which the structure and function of the parts of an organism change to enable specialization of those parts</p> <p>sexual reproduction reproduction in which the sex cells from two parents unite to produce offspring that share traits from both parents</p>
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1. **Predict** What would happen to an animal such as a shark if its heart failed?

2. **Compare** What is the difference between an endotherm and an ectotherm?

3. **Explain** Why is differentiation important to multicellular organisms?

4. **Explain** Does fertilization happen in asexual reproduction?

5. **Compare** How is fragmentation different from budding?
