

The Organization of Living Things

BEFORE YOU READ

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

- What are the benefits of being multicellular?
- What are the four levels of organization in living things?
- How are structure and function related in an organism?



California Science Standards

7.1.f, 7.5.a

What Is an Organism?

An **organism** is any living thing. An organism made of a single cell is called a *unicellular* organism. An organism made of many cells is a *multicellular* organism. The cells in a multicellular organism depend on each other to survive and to keep the organism alive.

STUDY TIP

Outline As you read, make an outline of this section. Use the heading questions from the section in your outline.

What Are the Benefits of Having Many Cells?

Three benefits of being multicellular are: larger size, longer life, and specialization of cells.

READING CHECK

1. Identify What is one benefit to an organism of being large?

LARGER SIZE

Most multicellular organisms are bigger than one-celled organisms. In general, a large organism, such as an elephant, has fewer predators than a small animal. ✓

LONGER LIFE

A multicellular organism usually lives longer than a one-celled organism. A one-celled organism is limited to the life span of its one cell. A multicellular organism, however, is not limited to the life span of any one of its cells. Multicellular organisms can replace most of their cells as the cells die off.

SPECIALIZATION

In a multicellular organism, each type of cell has a particular job. No cell has to do every job for the organism. Specialization makes the organism more efficient.

CALIFORNIA STANDARDS CHECK

7.1.f Students know that as multicellular organisms develop, their cells differentiate.

Word Help: differentiate to become specialized in structure and function

2. Explain Why is cell specialization important?

SECTION 3 The Organization of Living Things *continued*

CALIFORNIA STANDARDS CHECK

7.5.a Students know plants and animals have levels of organization for structure and function, including cells, tissues, organs, organ systems

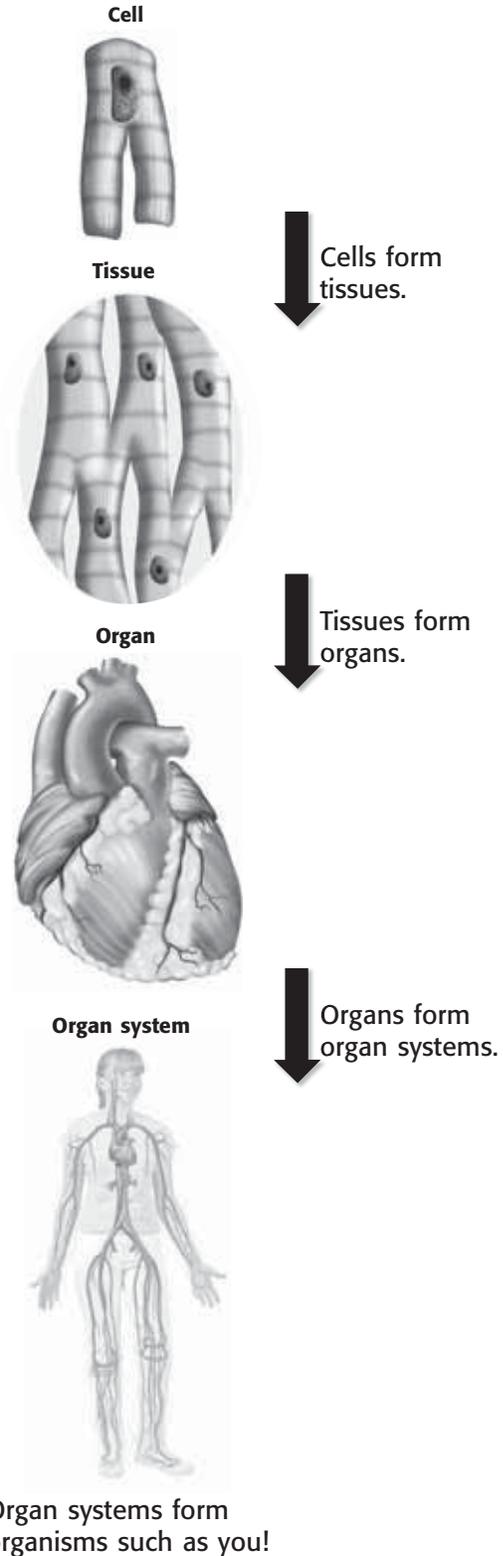
Word Help: structure
the arrangement of the parts of a whole

Word Help: function
use or purpose

3. List What are the four levels of organization for an organism?

What Are the Four Levels of Organization of Living Things?

Multicellular organisms have four levels of organization:



 **Say It**

Discuss With a partner, name some of the major organs in the human body. Talk about what organ systems they are part of.

SECTION 3 The Organization of Living Things *continued*

1. CELLS

Cells in a multicellular organism can be specialized. A specialized cell has a specific function. The **function** of a cell is the job it does. For example, a brain cell would not do the same job as a heart muscle cell.

The function of a cell is related to its structure.

Structure is the arrangement of parts in an organism.

The structure of a brain cell is different from the structure of a heart muscle cell. Structure includes shape and the material a part is made of.

2. TISSUES

A **tissue** is a group of cells that work together to do a specific job. Heart muscle tissue, for example, is made of many heart muscle cells. Animals have four basic kinds of tissue: nerve tissue, muscle tissue, connective tissue, and protective tissue. Plants have three kinds of tissue: transport tissue, protective tissue, and ground tissue.

3. ORGANS

A structure made of two or more tissues that work together to do a job is called an **organ**. Your heart, for example, is an organ made of different tissues. The heart has both muscle tissue and nerve tissue. ✓

Plants also have different tissues that act together as organs. Leaves, stems, and roots are all plant organs.

4. ORGAN SYSTEMS

A group of organs working together to do a job is called an **organ system**. An example of an organ system is your digestive system. Organ systems depend on each other to help the organism function. For example, the digestive system depends on the cardiovascular and respiratory systems for oxygen.

Plants also have organ systems. They include leaf systems, root systems, and stem systems.

 **READING CHECK**

4. Define What is an organ?

Section 3 Review

7.1.f, 7.5.a 

SECTION VOCABULARY

<p>function the special, normal, or proper activity on an organ or part</p> <p>organ a collection of tissues that carry out a specialized function of the body</p> <p>organ system a group of organs that work together to perform body functions</p>	<p>organism a living thing; anything that can carry out life processes independently</p> <p>structure the arrangement of parts in an organism</p> <p>tissue a group of similar cells that perform a common function</p>
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1. **List** What are three benefits of being multicellular?

2. **Contrast** Fill in the chart below to contrast the levels of organization in an organism.

Level of organization	Description	Example
	the smallest unit that can perform all life processes	
		heart muscle
	a collection of tissues that carry out a specialized function	
Organ system		circulatory system

3. **Compare** How are structure and function different?

4. **Explain** What does “specialization of cells” mean?
