

Biological Organization

Chapter 1

Look closely at your hand. What do you see? You see skin. Now squeeze your fingers and wrist with your other hand. You feel bones and some soft parts, too. Bones and skin are made up of even smaller parts called cells. A **cell** is the smallest unit of life. Cells are the basic unit of all living things.

Some tiny organisms consist of just one cell. These are called unicellular. These organisms are so small that you cannot see them without a microscope.

Many organisms, such as plants and animals, are made of many cells. They are called multicellular. Each type of cell has its own job. All the cells work together to help keep an organism alive.

Big Question

How are cells and tissues related in living things?

Vocabulary

cell, n. the smallest unit of life

Word Parts

The prefix *uni-* means one.

The prefix *multi-* means many.



Bacteria are organisms that consist of only one cell. An individual is called a bacterium.

Cells Are the Building Blocks of All Animal Life

Animals are made of many kinds of cells. Each type of cell has its own role. Skin cells, blood cells, nerve cells, and muscle cells are just a few of the kinds of animal cells.

Skin cells form a layer. This layer covers the whole body. In this way, it protects all the parts inside an animal's body. Special skin cells make fur, hair, and nails.

Blood carries oxygen throughout an animal's body. Blood also contains cells that help to keep the animal from getting sick.

Nerve cells help to send messages to and from an animal's brain. They deliver these signals to the rest of the animal's body. Some nerve cells connect to muscles. Their signals tell the muscles to move. In turn, muscle cells help an animal to move. Special muscle cells cause the heart to beat.

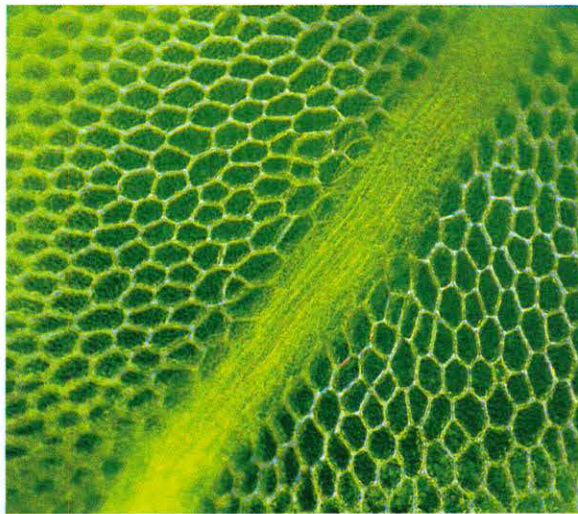


These are a type of cell found in blood. These cells fight infection throughout an animal's body.

Cells Are the Building Blocks of All Plant Life

Like animal cells, types of plant cells have their own jobs that help to keep plants alive. Leaves are made of cells. Some of these cells make or store food for the plant. Other leaf cells allow the plant to take in air that it needs. Another type of leaf cells form tubes that carry food from the leaves to the rest of the plant.

Stems and roots are made of cells, too. Bundles of cells make the stem stiff and strong. Tubes in the stem, which develop from cells, allow water to move. Root cells take in water from the soil. The water moves from roots through the stem to the leaves.



This photo taken through a microscope shows cells in the leaf of a plant.

Groups of Similar Cells Form Tissues

Groups of similar kinds of cells form **tissues**. In animals, groups of muscle cells that work together make up muscle tissue. Muscle tissue allows an animal to move.

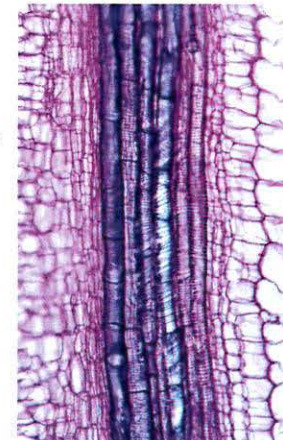
Vocabulary

tissue, n. a group of similar cells joined together

Bone tissues are made of bone cells. Bones protect soft parts inside an animal and help to add a rigid structure to give an animal shape. Connective tissues help hold different body parts together. Each of these types of tissues is made of a group of similar cells.

Plants have several tissues too. Some tissue forms the outside of a plant—its protective layer. Another kind of tissue transports water and nutrients to the plant's stems and leaves. Yet another type of tissue forms the growing parts of the plant at the tips of stems and roots. Each of these types of tissues is made of a group of similar cells.

In all living things, cells make up tissues. This pattern of structure is what scientists call *biological organization*.



Tissues inside plants form tube-like structures. This type of tissue carries water from the roots, through the stem, and to the leaves.