

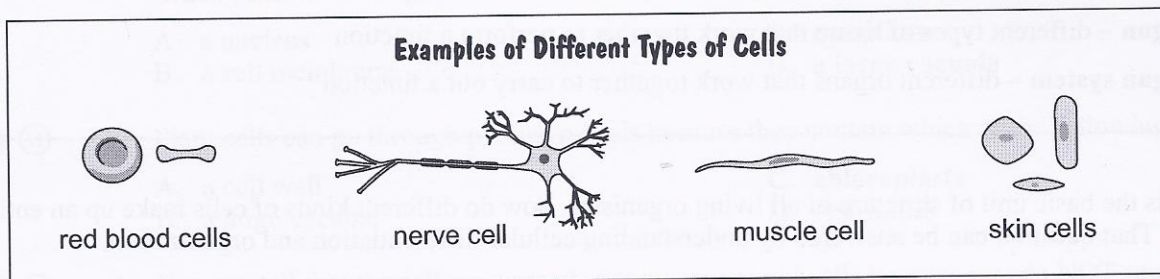
Section 6.4, continued

Cellular Organization

Cellular Organization

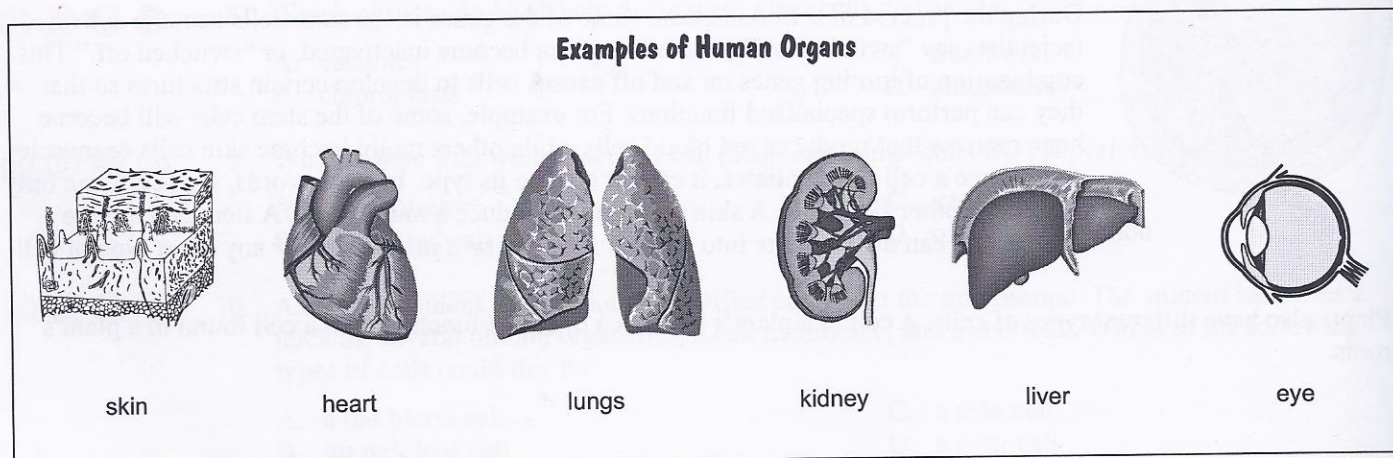
Now, how are all of these cells put together to form something as complex as a human being? They are organized into different levels. Cells make up tissues, tissues make up organs, organs make up organ systems, and organ systems make up an organism. Let's take a closer look.

Cells: So far, you've seen a diagram of a generic animal cell and a generic plant cell, but many cells have unique shapes and properties to perform specific functions. Look at some examples of different types of cells below that can be found in the human body. These, of course, are not the only types of cells, but they are common ones.



Cells make up tissues. Groups of similar cells that work together to perform a certain function form a **tissue**. Humans and most animals have four basic types of tissue: epithelial, connective, muscular, and nervous. Each of these basic types can be further divided. **Epithelial tissue** acts as a lining, so it helps to make up the skin and the linings of internal organs. **Connective tissue** includes cartilage, bone, and even blood. **Muscular tissue** is broken down into three types: skeletal muscle, like the biceps in your arm; cardiac muscle found only in the heart; and smooth muscle found in internal organs such as the stomach. **Nervous tissue** sends and receives electrical impulses. It is found in peripheral nerves, in the spinal cord, and in the brain. Plants have tissues also. For example, plant cells that work together to carry water and minerals throughout a plant make up a plant tissue called xylem.

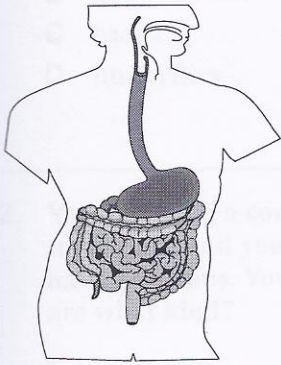
Tissues make up organs. When several different types of tissues work together to carry out a certain function, they form an **organ**. In your eyes, you have muscles, the optic nerve, the retina, and other specialized tissues that work together to help you see. Your eye is an example of an organ. Other common organs include the stomach, the heart, the lungs, the kidneys, and the liver, to name a few. Believe it or not, plants also have organs. Plant organs include the roots, the stems, and the leaves. Review some common human organs shown below.



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Organs make up organ systems. Organ systems are made of organs that work together. Your eyes are part of your nervous system, along with your brain, your spinal cord, and other tissues and specialized cells. Other human organ systems would include the digestive system made up of organs like the tongue, the esophagus, the stomach, and the small intestines. Organ systems are found in many living organisms. Plants have two organ systems: the shoot system above the ground and the root system below the ground. Review some of the common human organ systems pictured below. The common organs that make up each system are also listed although the lists are not necessarily complete.

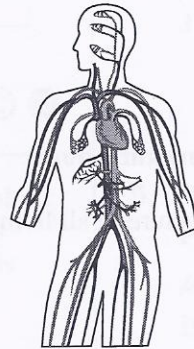
Examples of Human Organ Systems



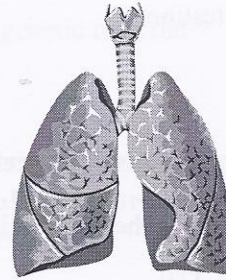
Digestive System:
 esophagus, stomach,
 small intestines,
 large intestines



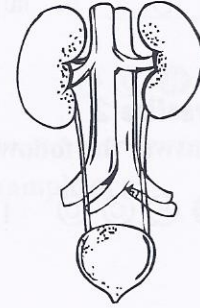
Skeletal System:
 skull, ribs, vertebra,
 pelvis, etc.



Circulatory System:
 heart, blood vessels



Respiratory System:
 nose, larynx, trachea,
 bronchi, lungs



Urinary System:
 kidneys, ureter,
 bladder

All the organ systems work together to form an organism. Examples of organisms would be a human being, a lady bug, a cat, a fish, or an oak tree.

Summary of Cellular Organization

