

Ch. A1

From Single Cells to Body Systems

## Cells

### The Discovery of Cells

- One scientist who built and used an early microscope was \_\_\_\_\_.
- The tiny walled spaces he saw in the cork reminded him of tiny rooms. So he called them \_\_\_\_\_.
- The \_\_\_\_\_ is the basic unit of structure and function of all living things.

### Kinds of Cells

- Scientists have classified about a million kinds of \_\_\_\_\_ and \_\_\_\_\_.
- The simplest organisms, such as bacteria, are each a \_\_\_\_\_ cell.
- Each kind of cell has a particular \_\_\_\_\_.
- The \_\_\_\_\_ and \_\_\_\_\_ of a cell depend on its function.
- Cells work together to perform basic life processes that keep an organism alive. These processes include releasing energy from \_\_\_\_\_, getting rid of body \_\_\_\_\_, and making new cells for \_\_\_\_\_ and repair.

### Plant and Animal Cells

- \_\_\_\_\_ is the organelle that determines all of a plant cell's activities and the production of new cells.
- \_\_\_\_\_ is the threadlike structures that contain information about the characteristics of the plant
- \_\_\_\_\_ is a covering that holds the plant cell together and separates it from its surroundings
- \_\_\_\_\_ is a rigid layer that supports and protects the plant cell.
- \_\_\_\_\_ is a jellylike substance that contains many chemicals to keep the cell functioning.
- \_\_\_\_\_ is an organelle that makes food for the plant cell

- \_\_\_\_\_ is an organelle that stores food, water, or wastes
- \_\_\_\_\_ are organelles that release energy from food.

### **Materials Move into and out of Cells**

- In the process of \_\_\_\_\_, particles of a substance move from an area where there are a lot of particles of the substance to an area where there are fewer particles of the substance.
- The movement of water and dissolved materials through cell membranes is so important to living organisms that it is given a special name -- \_\_\_\_\_. Cells get most of their water through this.

### **Tissues, Organs, and Systems**

- Cells that work together to perform a specific function form a \_\_\_\_\_.
- Most of the mass of an animal is \_\_\_\_\_, which is made up of cells that contract when they receive signals from the brain.
- The signals that cause muscle tissue to contract travel through another type of tissue, \_\_\_\_\_.
- \_\_\_\_\_ is the third kind of tissue. It includes the tissue in bones, cartilage, and tendons. Blood is also this type of tissue.
- \_\_\_\_\_ tissue includes the body covering of an animal. It also lines most internal organs.
- Just as cells that work together form a tissue, tissues that work together form an \_\_\_\_\_.
- Organs that work together to perform a function form a \_\_\_\_\_.

## Human Body Systems

### From Cells to Systems

- Organs work together to form body \_\_\_\_\_.
- The \_\_\_\_\_ breaks down food into nutrients the body needs for energy.
- Without the \_\_\_\_\_, the nutrients couldn't travel to the parts of the body that need them.

### The Circulatory System

- The \_\_\_\_\_ transports oxygen, nutrients, and wastes through the body in the blood.
- Blood also contains \_\_\_\_\_ - tiny pieces of blood cells inside membranes. These cause blood to clot when a blood vessel is cut.
- The \_\_\_\_\_, an organ made of muscle tissue, pumps blood through blood vessels.
- Blood leaves the heart through blood vessels called \_\_\_\_\_.
- \_\_\_\_\_ are blood vessels so small that blood cells have to move through them in single file.

### The Respiratory System

- Warm, clean air then travels down your \_\_\_\_\_, or wind pipe.
- The trachea branches into two tubes called \_\_\_\_\_, each leading to a lung.
- At the end of the smallest tubes are tiny air sacs called \_\_\_\_\_.

### The Digestive System

- The digestive system provides the \_\_\_\_\_ your cells need to produce energy.
- The first function of the digestive system is to break food into \_\_\_\_\_.
- The second function of the digestive system is to get the nutrients to the \_\_\_\_\_.
- When you swallow, food passes through the \_\_\_\_\_, a long tube that leads to the stomach.

- Nutrients diffuse through the \_\_\_\_\_, projections sticking out of the walls of the small intestine, into the blood.

### **The Excretory System**

- The wastes must be removed from the blood, and this is the function of the \_\_\_\_\_.
- As blood flows through capillaries in the kidneys, urea and water enter tubes called \_\_\_\_\_.
- When the bladder is full, urine leaves the body through a channel called the urethra.

## Systems Working Together

### Bones and Joints

- \_\_\_\_\_ is a connective tissue that produces red blood cells and white blood cells.
- Bones meet at \_\_\_\_\_, where they are attached to each other and to muscles.

### The Skeletal System

- Bones are organized into a \_\_\_\_\_, which provides support for your body.
- On each side of a joint, muscles are attached to bones by \_\_\_\_\_, tough bands of connective tissue.
- Bones are attached to each other by \_\_\_\_\_, bands of connective tissue that hold the skeleton together.
- An adult human skeleton has \_\_\_\_\_ bones.
- Each hand has \_\_\_\_\_ bones, and each foot has \_\_\_\_\_ bones.

### The Muscular System

- There are three kinds of muscles, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.
- \_\_\_\_\_ move bones and hold your skeleton upright.
- \_\_\_\_\_ contract slowly and move substance through the organs they surround.
- \_\_\_\_\_ make up the walls of the heart.

### The Nervous System

- Your \_\_\_\_\_ allows you to experience things and to react to your environment.
- It connects all the \_\_\_\_\_ and \_\_\_\_\_ of your body to your brain.
- The central nervous system is made up of the \_\_\_\_\_ and the \_\_\_\_\_.

- A \_\_\_\_\_ is a specialized cell that can receive signals and transmit them to other neurons.
- \_\_\_\_\_ are nerve cells that detect conditions in the body's environment.
- Some muscle actions are automatic responses to situations. These are called \_\_\_\_\_ .