

Human Body Systems

Heredity

Parents and offspring are alike because they share genetic material.

Inherited characteristics are determined before birth and *cannot* be permanently changed. Eye color, hair color, skin color, freckles, and dimples are examples of inherited characteristics of humans.

Learned characteristics are features that result from experience and the influence of the environment. Favorite hobbies, dislikes of certain foods, and speaking a certain language are *learned* characteristics because they are *not* inherited.

Offspring is not identical to one parent because it receives traits from a second parent.

Cells

All living things, such as plants and animals, are made up of at least one cell.

Unicellular – single celled organisms. These organisms perform *all* life processes within a single cell. Small organisms, such as bacteria and protists, are made up of one cell each. This single cell must be able to perform all the life processes the organism needs to survive. There are more single-celled organisms than multi-celled organisms in the world. They are just so small that they cannot be seen without a microscope.

Multi-cellular – Multi-celled organisms or organisms made up of many different kinds of cells. Large, complex organisms, such as plants and animals, are made up of many cells. Within these complex organisms, there are many different kinds of cells that have different jobs. These cells are different sizes and shapes. Cells from multi-celled organisms cannot survive on their own for very long. The cells must work together in order to get food, air, and other resources, and to help the organism as a whole to move, grow, and reproduce.

In multi-celled organisms, most cells within the organism are too far away from the external environment for direct exchange. This is the reason multi-cellular organisms have developed **transport systems** made up of many similar cells working together. These transport systems include the circulatory and digestive systems in humans. Formation of specialized cells for transport is what allows organisms to become multi-cellular.

Multi-cellular organisms are able to perform many jobs that unicellular organisms cannot. However, both multi-cellular *and* unicellular organisms can take in nutrients (eat), grow, and reproduce.

Cells, tissues, and organs group together to form organ systems in most animals and humans. These systems perform different functions that help meet the basic needs of the animals.

Human Body Systems

Skeletal System

The skeletal system is made up of over 200 **bones**.

The three main jobs of the skeletal system are to protect organs, provide support for the frame of the body, and allow movement.

The skeletal system works with the muscular system to provide movement.

Muscular System

Muscles attach to the bones of the skeletal system and allow the body to move.

The **pull** of a muscle occurs when the muscle **contracts** and become shorter and tighter. Often muscles work in pairs so that one *relaxes* while the other *tightens*.

Nervous System

The nervous system controls all of the other systems in the body. The nervous system consists of the **brain**, spinal cord, and nerve cells.

When humans use their senses (sight, smell, touch, taste, hearing), the sense organs (eyes, nose, skin, mouth, and ears) send information to the brain using the nervous system's pathways.

The nervous system controls all bodily function and movement.

Respiratory System

The **lungs** are the main structure of the respiratory system.

The respiratory system provides oxygen for all of the body's cells and removes the carbon dioxide waste from the cells.

When you inhale, or breathe air into the lungs, you breathe in oxygen. When you exhale, or breathe air out of the lungs, you release carbon dioxide.

Circulatory System

The circulatory system is made of the **heart**, blood, and blood vessels. Types of blood vessels include arteries, veins, and capillaries.

The heart has four chambers and pumps blood directly into arteries. The circulatory system's main job is to move blood through the body.

Veins transport blood **to** the heart. Arteries transport blood **away** from the heart. Veins also carry blood to and from cells, which allow nutrients to get to the cells in the body.

The circulatory system works closely with the respiratory system to get oxygen from the lungs to all of the cells in the body.

Digestive System

The digestive system is responsible for getting food in and out of the body.

The organs in the digestive system include the mouth, esophagus, **stomach**, small intestine, and large intestine.

Food goes down your esophagus into your stomach. In the stomach, a strong acid breaks down the food. It then moves to the small intestine. Nutrients are then absorbed into the bloodstream. The solids that are left in the bloodstream are digested in the large intestine. The body absorbs the water from these solids and eliminates the compacted solids as waste.

Bile helps to digest fats.

Kidneys remove waste from the blood.