

The phase of the cell cycle

Prophase: Nuclear envelope breaks down & chromosomes condense

Metaphase: Chromosomes line up in the middle of the cell

Anaphase: The sister chromatids separate from each other and are pulled towards opposite ends of the cell

Telophase: Two nuclei form

Cytokinesis: The cytoplasm separates & two new daughter cells form

The musculoskeletal system

| Bones | Ligaments |
|---|------------------------------------|
| Hard & dense | tough, elastic connective tissue |
| Consists of bone cells within a matrix of minerals | holds bones together at the joints |
| mainly made of calcium & phosphorus & collages fibres | made of long fibers of collagen |

The musculoskeletal system

What is the purpose of the musculoskeletal system?

- allows for movement & supports the body

What organs make up the musculoskeletal system?

- made up of bones and skeletal muscle

How do muscles make bones move?

- the nervous system sends a signal to the muscles to contract

- muscles commonly work in pairs. one muscle usually pulls while the other pushes

The nervous system

- The central nervous system contains the brain and spinal cord

- the peripheral nervous system which is a network of nerves and neural tissues branching out throughout the body
Brain

- sends electrical signals to the body
Neurons

- neurons are nerve cells

- neurons conduct electrical impulses so that the body can send and receive messages

Neurons have 3 parts

1) cell body: contains the nucleus and organelles

2) Dendrites: branches that receive electrical impulses

3) Axon: extension that carries impulses away from the cell body

Specialized & cancer cells

- special shapes and structures that allow them to do special functions

- A cell that comes from a non-specialized cell (stem cell) look different

- is different internally

Stem cells can differentiate into all the different cell types that make up your body

- Nerve cells

- Skin cells

- liver cells

- Pancreatic cells

- Red blood cells

- Heart muscle cells

Specialized cells carry out a specific job

- Muscle cells burn more calories

- Muscle cells: for movement

- Fat cells tend to store calories

- Fat cells: to store fat

- Red blood cells: to deliver oxygen and remove carbon dioxide

Muscle cells: a lot of mitochondria

Cells in intestine: lots of golgi bodies

Fat cells: large vacuole

Adult stem cell transplant

Umbilical cord blood has a high concentration of the adult stem cells (cancer in bone marrow)

Bone marrow transplant: a procedure to replace damaged or destroyed bone marrow with healthy bone marrow stem cells; to replace replenish bone marrow that has been destroyed by drugs or radiation therapy for cancer such as leukemia

Causes of cancer

DNA mutation

-DNA mutation is the changes to a cell's DNA

- It can be caused by carcinogens or inherited

Comparing normal cells and cancer cells

| Normal cells | Cancer cells |
|---|---|
| Make exact copies of themselves through mitosis | Make exact copies of themselves through mitosis |
| Reproduce for about 20-30 rounds | Do not stop reproducing |
| Stick together to form masses of cells | Do not stick to other cells |
| Self-destruct when too old or too damaged | Behave independently |
| | May move to another location of the body |

The digestive system

Functions of the digestive system

1) takes in food

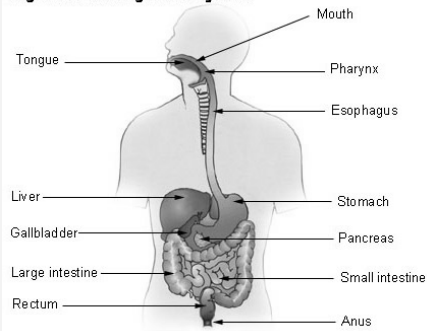
2) digest food

3) eliminates remaining waste from your body



The digestive system

Organs of the Digestive System



Parts & accessory organs of the digestive tract

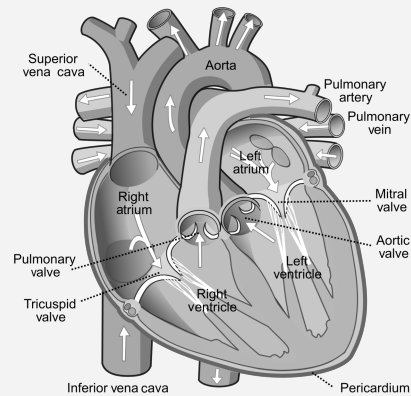
- Mouth:** Digestion begins here. Food is broken down by grinding teeth and saliva
- Esophagus:** long tube that runs from mouth to the stomach
- Stomach:** large, sac like organ that churns food and bathes it in a strong acid
- Small intestine:** food is further broken down by chemicals from liver, pancreas, and intestine. Nutrients are absorbed
- Large intestine:** Absorbs water
- Anus:** where waste exits the body
- Liver:** Makes bile which breaks down lipids
- Gallbladder:** Stores chemicals and bile. Releases them into digestive tract when there is food to be digested
- Pancreas:** Makes insulin which controls how sugar goes from blood to cells

The circulatory system

organ system responsible for transporting substance throughout the body. it consist of the heart, blood and blood vessels.

Human heart has 4 chambers: right atrium, left atrium, right ventricle and left ventricle

Human heart



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By **ramenzo**
cheatography.com/ramenzo/

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