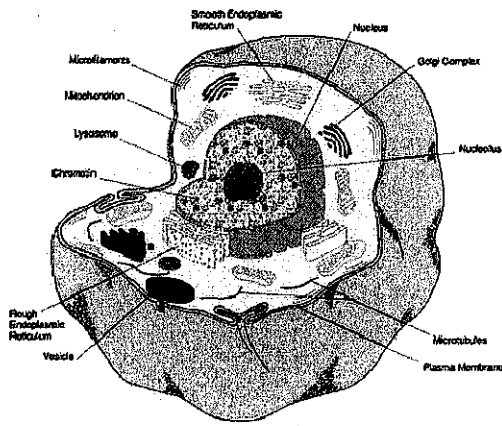


Cell Unit Review



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Main Ideas:

- Everything that is living is made of at least one cell.
- Cells are too small to see without a microscope.
- Every cell has parts—each of those parts has a special job that you need to know about.
- Your cells grow and divide all the time. The process is called the cell cycle.
- Your cells use respiration to change food into energy. They take oxygen and food and turn it into ATP, a molecule our cells use for energy.

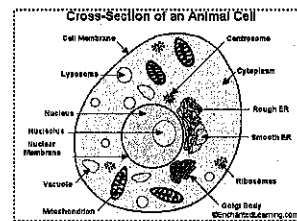
Parts of a Cell

Animal cells have ten different parts that you need to know about. Most animal cells are **eukaryotes**—this means that they have a nucleus. The **nucleus** is the control center of the cell. It is where our genetic information is stored. It also contains the **nucleolus**, which makes our ribosomes.

Eukaryotes also have other parts:

- **Ribosomes** are the parts of our cells that make proteins.
- **Endoplasmic reticulum** transports various materials throughout the cell.

- **Golgi bodies** package materials in the cell.
- The **mitochondria** are where respiration occurs. They change energy into a form that our body can use.
- The **cell membrane** is a phospholipid bilayer that protects the

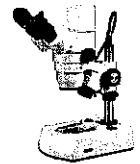


our cells. Materials are held there until our body needs them somewhere else.

- The **cytoplasm** is the fluid within our cell. Fermentation occurs in the cytoplasm.

Animal cells need all of their parts to be work-

ing together to function correctly. Remember, cells are the basic unit of all living things. When our cells die, we die!



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Cell Theory

Many scientists helped with the discovery of cells and to develop the cell theory. The cell theory has three parts.

1. All living things are made of one or more cells.
2. A cell is the basic unit of structure and function in living things.

3. All cells come from other living cells.

Robert Hooke was the first scientist to see cells, and he gave them their name. After Hooke made his discovery, **van Leeuwenhoek** saw blood cells and living organisms in pond water. Two

scientists (**Matthias Schleiden** and **Theodor Schwann**) stated that all plants and animals are made of cells. Finally, **Rudolf Virchow** stated that all cells can be produced only by living cells.

The Cell Cycle: Interphase, Mitosis, and Cytokinesis

Our cells **reproduce** by growing and dividing. One **parent cell** makes a copy of itself and forms two identical **daughter cells**.

The cell cycle, which is the phases of interphase, mitosis, and cytokinesis, is a process that is happening all the time. Our cells are always growing and dividing.

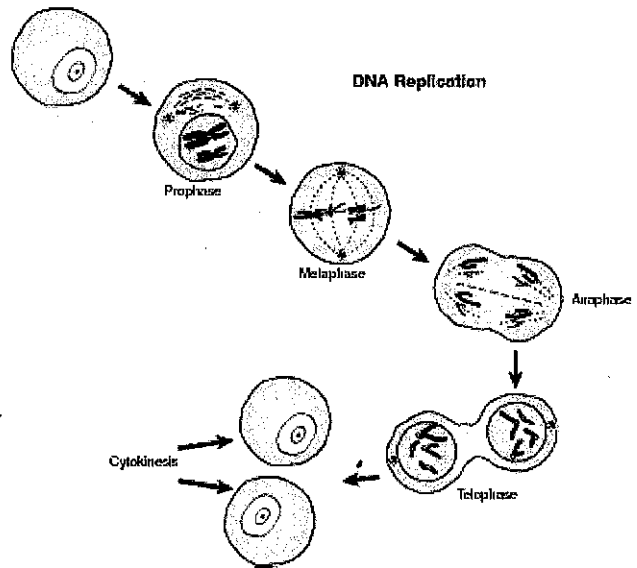
During **interphase**, which is the **longest** phase of the cell cycle, the cell grows and makes copies of its chromosomes. These copies are called **sister chromatids**.

During **mitosis**, the cell's nucleus divides. Mitosis has four phrases.

1. **Prophase:** The nuclear membrane breaks down and **spindle fibers** attach to the sister chromatids.
2. **Metaphase:** The sister chromatids **meet** in the middle of the cell.
3. **Anaphase:** The spindle fibers pull apart the sister chromatids. Each sister chromatid is an exact duplicate of the parent cell's DNA.

4. **Telophase:** The spindle fibers disappear and the new nuclei forms.

During **cytokinesis**, the cytoplasm divides, and we finally have two cells with a complete set of chromosomes.



Cellular Respiration

When we eat, our bodies have to change food into a form that they can use.

When our body has oxygen to use, it takes the oxygen and the food molecules we have eaten. A chemical reaction occurs in a cell's mitochondria. This chemical reaction converts these ingredients into **ATP**,

the molecule that our body uses for energy, and carbon dioxide.

However, our body doesn't always have enough oxygen. Sometimes we work out too hard, and our body has trouble getting all the oxygen that it needs. When this happens, our body has to undergo a

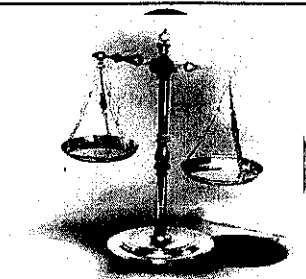
process called **fermentation** instead. Fermentation is another way our body can make ATP in the cytoplasm of our cells. However, our body would prefer to do respiration because it makes more energy

Our bodies' cells undergo lots of different processes to make sure that our bodies stay healthy and work the way they should.

Other Cell Processes

Homeostasis: Our body must maintain a stable internal (inside) environment. That means that a cell needs to keep its temperature about the same. It also needs to keep its levels of nutrients and water about the same. This balance inside our body is called **homeostasis**.

Meiosis: Our gametes (sex cells) also reproduce. This process is called meiosis.



Passive transport: Our cells move molecules across the cell membrane in a few ways. If the cell does not use energy to move the molecules,

we call it **passive transport**. The molecules are moving from areas of high concentration to areas of low concentration. We call this **diffusion** unless water is doing the moving—then we call it **osmosis**.

Active transport: When our cells use energy to move molecules from an area of low concentration to an area of high concentration, we call it **active transport**.