**Moving Cellular Materials**

**Why do things move into cells?**

* Just like you, cells need certain materials to live. Actually, you need these materials because your cells need them.
* Cells need \_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_, and other substances.
* These materials must pass through the cell membrane to get into the cell.

**Why do things move out of cells?**

* Just like you, cells produce wastes. Actually, the wastes you remove from your body are the wastes your cells produced.
* Some of these wastes are \_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* These materials must pass through the cell membrane to get out of the cells and into your blood. Your blood takes them to a place where they can get out of your body.

**How do materials move through the cell membrane?**

* Some materials move through the cell membrane by passive transport. This means the cell does not use \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to move these substances in or out. They just let it happen.
* Some materials move through the cell membrane by active transport. This means the cell must use energy to move these substances in or out.

**Three types of passive transport**

1. Diffusion
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Facilitated Diffusion

**Diffusion** (see diagrams A – F)

* Diffusion is the random movement of molecules from an area where they are \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (high concentration) to an area where they are less crowded (lower concentration). Examples: perfume spreading in a room; food coloring spreading in a beaker of water
* This happens because the molecules are moving and bouncing off of one another.

**Equilibrium** (see diagram D)

When the concentration of molecules is the same inside and outside the cell (equilibrium), the molecules keep moving in and out of the cell but they move in and out at the same rate. This means when molecules move into the cell, the same number of molecules move out of the cell, therefore the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ stays the same in both places.

**Examples of molecules that diffuse through cell membranes**

* Oxygen
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Water

**Osmosis**

* Osmosis is the diffusion of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ through a cell membrane.
* If cells are surrounded by water that contains some dissolved substances, water will diffuse out of the cells. This happens because the water is more highly concentrated in the cell than outside the cell. (see diagram G)

**Facilitated Diffusion** (see diagrams H – K)

Some molecules are too big to diffuse normally through the cell membrane. Facilitated diffusion is where \_\_\_\_\_\_\_\_\_\_\_\_\_\_ channels (openings) in the cell membrane allow these larger molecules get through.

**What are the three types of active transport?**

1. Active transport by transport proteins.
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Exocytosis

**Active transport by transport proteins**

* Transport proteins \_\_\_\_\_\_\_\_\_\_\_\_\_\_ molecules to move in the opposite direction of diffusion. Molecules move from an area of lower concentration to an area of higher concentration.
* This happens when a cell needs more of a substance, but the concentration is higher inside the cell than it is outside the cell.
* This requires the cell to use energy.

**Endocytosis** (see diagram L)

* Molecules too big to pass through the cell membrane by diffusion or transport proteins can be taken in by endocytosis.
* Endocytosis is where the cell membrane \_\_\_\_\_\_\_\_\_\_\_\_\_\_ the substance to bring it in.
* A protist called an ameba gets its food that way.

**Exocytosis** (see diagram L)

* Molecules too big to pass through the cell membrane by diffusion or transport proteins can be removed by exocytosis.
* Exocytosis is where substances inside the cell are moved to the cell membrane and the cell membrane \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to let them out.
* Amebas get rid of wastes this way.