**Topic 8 Lesson 3- Obtaining and Removing Materials from Cells**

**Student Notes**

**What is Homeostasis?**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the maintenance of a constant internal state in a changing environment.
* Homeostasis ensures that cells can **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**energy, **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** new cells,\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_materials, and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**wastes in a changing environment.
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** organisms exchange materials directly with the environment.
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**organisms have systems that transport materials to cells from other places **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**the organism.
	+ ***Examples:*** The cardiovascular system in humans and *xylem* and *phloem* in plants are transport systems.

**How do cells exchange materials?**

**Cell Membrane and Cell Wall:**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_made of proteins and lipids
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells have cell membranes and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – ex: plants, fungi and bacteria

****

Cell Membrane

Cell Wall

**Function of the Cell Membrane:**

* Cell membrane separates the components of a cell from its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_—surrounds the cell
* “Gatekeeper” of the cell—regulates the flow of materials into and out of cell—\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Cell membrane helps cells maintain \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_—stable internal balance

**There are 2 types of transport**

**Passive Transport**

* cell **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  use energy
	1. **Diffusion** is the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** particles across a selectively permeable membrane until **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/** balance is reached.
		1. These particles move from an area of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** to an area of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** concentration.
	2. **Osmosis** is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_r through a selectively permeable membrane
		1. Water diffuses across a membrane from an area of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_concentration to an area of\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ concentration

**Active Transport**

Active transport is the movement of molecules from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ concentration. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ required.

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the cell help with this movement

Ex: Body cells must pump carbon dioxide out into the surrounding blood vessels to be carried to the lungs for exhale. Blood vessels are high in carbon dioxide compared to the cells, so energy is required to move the carbon dioxide across the cell membrane from LOW to HIGH concentration.

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** is the method used for **very large molecules** (such as food and wastes) get into and out of the cell



* **Food is moved \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the cell by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* **Wastes are moved \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the cell by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**How do organisms maintain homeostasis?**

* **Cells and whole organisms must work to maintain homeostasis in a constantly changing environment.**
* **Some animals adapt their behavior to control body temperature.**

**Examples:**

* **Trees can show seasonal responses to changes in the environment.**

**Examples:**