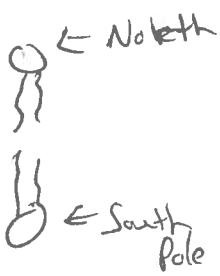

Name _____

Passive & Active Transport (p. 74 – 83)

I. Diffusion

1. Define the term passive transport. (Floating downstream) → No energy

Passive Transport – movement across the cell membrane that does not require energy from the cell.

- Kids in a classroom → Going to next class in hallways

2. Differentiate between a concentration gradient and equilibrium.

Concentration Gradient : Difference in the concentration of a substance

Equilibrium : Concentration of a substance is equal throughout a space (Swimming Pools)

3. Define the term diffusion.

p. 75

Diffusion – movement of a substance from an area of high concentration to an area of lower concentration (caused by random motion of particles)

DEMO → Food Coloring

4. What are two types of substances that can passively diffuse across a cell membrane?

1. Very small 2. Non polar

(Interior of lipid bilayer = nonpolar)

II. Osmosis

1. Define the term osmosis.

p. 76

Osmosis – (diffusion) movement of water through a selectively permeable membrane

2. Water diffuses from a ~~lower~~ high concentration to a ~~higher~~ lower concentration.

Circle One : True **(False)**

3. Complete the table.

p. 77

Fluid Outside Cell	Outside Solution	Water Movement	Result
Lower Water Concentration (Salt water)	Hypertonic	Out of Cell	Cell Shrinks
Higher Water Concentration (Freshwater)	Hypotonic	Into Cell	Cell Swells
Same Concentration	Isotonic	In & Out at Equal Rates	No change

4. How do contractile vacuoles reduce swelling effects due to hypotonic solutions?

Rigid Cell Walls – Plants, Fungi

Collect excess water in cell and forces it out of cell

(Single-celled eukaryotes) → Ex. Paramecium, Euglena

Name _____

III. Crossing The Membrane

Polar - attracted to water

Nonpolar - repelled by water

1. Define the term ion channel. p. 78

Ion Channel – transport protein with a polar pore through which ions can pass

2. List four common ions transported through ion channels. (Cannot diffuse through bilayer

Potassium - need for heart, muscles, digestion

1. Na^+ (sodium) 2. K^+ (potassium) 3. Ca^{+2} (calcium) 4. Cl^- (chloride)

3. The inside of a cell is typically more ~~positively~~ negatively-charged than the outside solution.

Circle One : True **False** (More likely for positively-charged ions to move inward

Toll Bridge

Ferry

p. 80

4. Define the term facilitated diffusion.

Facilitated Diffusion – assistance of carrier proteins to move substance from a high concentration to lower concentration

5. List three types of substances transported through facilitated diffusion. (Not in the book.)

1. Large 2. Polar 3. Hydrophilic

IV. Movement Against A Concentration Gradient *(Primary Transport)*

1. Define the term active transport. (Rowing upstream → needs energy

Active Transport – transport of a substance across the cell membrane against its concentration gradient

2. Active transport requires the usage of ATP energy.

Circle One : **True** False

3. Describe how a sodium-potassium pump operates across a cell membrane.

p. 82

McGraw-Hill animation

1. Higher concentration of Na^+ outside cell / K^+ inside = higher
2. (3) Na^+ pumped out ; (2) K^+ pumped in

* IMPORTANT: Prevents sodium overload in cell

(Na^+ continuously diffuses in through ion channels

V. Movement In Vesicles *(Secondary Transport)* (Large Molecules, Whole Cells, Food Clumps)

1. Differentiate between endocytosis and exocytosis.

Lysosomes

p. 83

Endocytosis : cell engulfs material (movement of substance into cell

Exocytosis : cell removes material (movement of substance out of cell

Nerve cells, Glands