CELL MEMBRANES/TRANSPORT

Enduring Understandings

- A plasma membrane surrounds all cells and controls both the nutrients and waste products that enter and leave cells.
- The size, charge and polarity of substances affects how substances move across membranes.
- The random movement of molecules and their relative concentrations affects how they move across the membrane.

Essential Questions

- How does the structure of the plasma membrane affect the function of the plasma membrane?
- Why do molecules generally move from areas of high concentration to areas of low concentration?
- What is required for molecules to move from low concentration to high concentration?
- What molecules can easily pass across a membrane?
- What are the considerations that determine the specific movement of water across membranes?
- What is the process by which relatively large substances can move across the membrane?

Targets

1. **Vocabulary**—phospholipids, glycerol, fatty acid, hydrophobic, hydrophilic, transport protein, receptor protein, marker protein, lipid bi-layer, fluid mosaic model, selective permeability, diffusion, concentration gradient, dynamic equilibrium, osmosis, hypotonic, hypertonic, isotonic, turgor pressure, passive transport, active transport, facilitated diffusion, endocytosis, exocytosis
2. Describe the phospholipid molecule (the major component of a cell membrane) in terms of a chemical composition, areas of polarity and non-polarity, and orientation in forming a lipid bilayer. Draw what a phospholipids would look like.
3. Be able to label and/or describe a fluid mosaic plasma membrane. Be sure to include phospholipids labeling the hydrophilic and hydrophobic ends, cholesterol and transport protein. Describe the role of each of the components.
4. Why is the plasma membrane "selectively permeable?" What materials will pass readily across the membrane? What materials won't?
5. Describe the process of diffusion from unequal concentrations of substances to dynamic equilibrium. Be sure to discuss the role of random motion due to kinetic energy and concentration gradients.
6. Know the difference between isotonic, hypotonic and hypertonic solutions. Make sure you can predict the movement of water into and out of each of these types of solutions.
7. Be able to describe the three main types of passive transport: simple diffusion, osmosis and facilitated diffusion. What do all three types have in common? How are they different?
8. Describe the process of active transport and explain why energy is required. Describe the active transport processes of endocytosis and exocytosis.