**Unit 5 Objectives - Cell Membrane & Transport**

**MCAS Frameworks:** This unit addresses the following MA State Frameworks in Biology:

**2.1** Relate cell parts/organelles (plasma membrane, nuclear envelope, nucleus, nucleolus, cytoplasm,

mitochondrion, endoplasmic reticulum, Golgi apparatus, lysosome, ribosome, vacuole, cell wall, chloroplast,

cytoskeleton, centriole, cilium, flagellum, pseudopod) to their functions. Explain the role of cell membranes

as a highly selective barrier (diffusion, osmosis, facilitated diffusion, active transport).

**SIS1.** Make observations, raise questions, and formulate hypotheses.

**SIS2.** Design and conduct scientific investigations.

**SIS3.** Analyze and interpret results of scientific investigations.

**SIS4.** Communicate and apply the results of scientific investigations.

**Big Ideas**

1. The structure of molecules, cells and organs facilitate their functions.
2. Organisms can use different anatomical and physiological strategies to meet similar challenges.

**Essential Questions**

1. How does examining the relationship between structure and function help us understand the way organisms function?
2. How does the environment influence the anatomical and physiological strategies organisms use to carry out life processes?

**Unit 5 Objectives - Cell Membrane & Transport, Kidneys & Excretion**

**Reading:** Chapters: 7-3

**Objectives:** Upon completion of this unit, you should be able to:

**Topic 1: Cell membrane (Chapter 7-3)**

1. Describe the structure of the phospholipid and how that affects its ability to dissolve in water.
2. Describe the structure of the cell membrane (both lipid bilayer and proteins).
3. Describe the function of the lipid bilayer and proteins of the cell membrane.
4. Explain what is meant by selective permeability.
5. Relate concentration gradient, diffusion, and equilibrium.
6. Define the terms hypertonic, hypotonic, and isotonic as they relate to cells in a solution.
7. Describe the roles of diffusion, facilitated diffusion, and osmosis in the passage of materials into and out of cells.
8. Compare passive transport with active transport.
9. Define the terms endocytosis, pinocytosis, phagocytosis, and exocytosis.

**Key Terms and Concepts**

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| **Cell Membrane & Transport**  Cell membrane  Phospholipid  Phospholipid bilayer  Fluid-mosaic model  Simple diffusion  Concentration gradient  Permeability  Selectively permeable  Osmosis  Hypertonic solution  Hypotonic solution  Isotonic solution  Facilitated diffusion  Active transport  Endocytosis  Phagocytosis  Pinocytosis  Exocytosis |  |