**Activity 9 Challenge Question:** How do the structures of the cell membrane help it function?

**Introduction:**

Understanding the cell membrane is the key to understanding many diseases, and is of great value in developing treatments. Some diseases disable the ability of the cell membrane to reseal after it has been penetrated, and some destroy the function of the cell’s transport channels. The immune system recognizes foreign cells through receptors on the membrane of both the foreign cells through receptors on the membrane of both the foreign and immune cells. Many disease-causing pathogens, such as the HIV/AIDS virus and the polio virus, infect humans by recognizing and binding to the cell membrane, and then entering the cell. Preventing and treating such diseases as HIV/AIDS can improve the quality and length of people’s lives and improve their social and economic well-being.

**Before you start:**  What do you think would happen if the cell membrane lost its function to recognize foreign cells? Would the cell be able to prevent infection?

**Doing the Activity:** *Read pages 206-211 and answer the following questions while you read.*

Molecular Building Blocks of Cells and the Cell Membrane

1. What is a macromolecule?
2. What are the different macromolecules and their corresponding subunits?
3. Which macromolecule gives the cell membrane its strength?
4. What is a phospholipid?
5. Describe the structure of the cell membrane.
6. What is a fluid mosaic model?
7. Draw and label a picture of a phospholipid molecule.
8. Draw and label a picture of the phospholipoid bilayer.

The Cell Membrane Controls What Enters and Leaves the Cell

1. What is semipermeable, also known as selectively permeable?
2. What naturally diffuses in both directions of the cell membrane/
3. What does the direction of the movement depend on?
4. Define osmosis.
5. What is passive transport? Give an example.
6. What is active transport? Give an example.
7. What is endocytosis?
8. What is exocytosis?

Viruses and the Cell Membrane

1. What is an example of a disease caused by a virus?
2. Viruses are not made of cells so it cannot do what process?
3. What is found in a virus?
4. HIV/AIDS only effects cells of what body system?
5. How does a virus enter into a cell?
6. How does a virus interact with a cell?
7. What happens when a virus makes it inside a cell?
8. What Is the first way a virus can exit a cell?
9. What is the second wat a cell can exit a cell?

Analysis Questions: *Using what you have learned, answer the following questions.*

1. What functions and properties of the cell membrane depend on each of the following?

a. Phospholipids

b. Proteins

c. Carbohydrates

2. Explain why it is important for the cell membrane to be fluid.

3. What are the functions of the cell membrane? Explain which parts of the cell membrane allow it to perform these functions.

4. What determines whether or not a substance can cross the cell membrane?

5. Explain how the cell membrane helps the cell maintain homeostasis—a stable internal environment. Name speciﬁc structures of the cell membrane and describe their functions in your explanation.

6. Imagine a single-celled organism living in a pond. What would happen to the organism if runoff from irrigation caused the pond to become signiﬁcantly salty? Use evidence to support your explanation.