

Title: Cell Membranes

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Subject Area(s): Life Sciences, Biology

Grade(s): 9-12

Description of Lesson: The cell membrane is a selectively permeable membrane made up of a lipid bilayer and proteins surrounding the cell. The students will use the various tutorials to learn more about cell membranes, their structure, and their function in plant and animal cells.

This activity is broken down into various tutorials that deal with the cell membrane. This allows for them to focus on interconnected subject areas within the realm of the cell membrane. The areas are as follows: active transport; passive transport; carrier proteins; membrane proteins; lipid bilayers, endocytosis; exocytosis; diffusion through a membrane; osmosis in an animal cell; osmosis in a plant cell; plasma membrane—animal cell; plasma membrane—plant cell; and two review tutorials. Within each section, there are links to other sites.

Length of Lesson: 1-2 class periods (45 minutes each)

Student Objectives: The students will be able to describe the cell membrane, state structures, and functions of the various components in both plant and animal cells.

Materials: Access to computer lab

Procedure: The students should log into the website: <http://cnx.org/content/m15756/latest/>. The instructor will direct them to a particular tutorial (if so desired).

For this particular lesson, we are focused upon the functions of lipids.

Lipid Bilayer -- The lipid bilayer is an organic compound that is insoluble in water but soluble in nonpolar solvents, providing the basic impermeable structure of the membrane. Explore the process, structure, and function of a plasma membrane's lipid bilayer with this interactive tutorial.

When the student clicks on the subject area, a tutorial will appear. This particular tutorial has the following subject areas: lipid bilayer, P face, E face, lipid structure, phospholipids, and lipid. The student can click on each bar and it will give a brief description in the box and also be highlighted in the diagram.

Scientific Explanation: Cell membranes play the major role in determining what enters and leaves the cell. The lipid bilayer is an organic compound that is insoluble in water but soluble in nonpolar solvents, providing the basic impermeable structure of the membrane.

Assessment: There is an assessment can be found within the module. In addition, the instructor can prepare a ten question short answer page to be done with each subject area.

Kansas Science Standards:

Standard 1, Benchmark 1: The student will demonstrate abilities necessary to do the processes of scientific inquiry.

Standard 3, Benchmark 1: The student will demonstrate an understanding of the structure and function of the cell.

Missouri Science Standards (GLE's):

Strand 3.1, There is a fundamental unity underlying the diversity of all living organisms.

Strand 3.2, Living organisms carry out life processes in order to survive.

Strand 7.1, Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.