Abstract:

Biological membranes are among the fundamental concepts upon which cellular biology is based. Regardless of their nature, prokaryotic or eukaryotic, membranes are integral to the structure and function of all cells. Among their roles, membranes are essential to: maintaining the integrity of the cell and the various membrane-bound organelles within the cell, regulating the transport of materials into and out of the cell, responding to external and internal stimuli, and cell-to-cell recognition. Due to the functional complexity of biological membranes, it was necessary to narrow the scope of this unit to the chemistry of membrane structure and the transport of substances across membranes. The behavioral objectives for this unit are twofold. They include the ability of the students to: compare and contrast the chemical composition of biological membranes from a variety of prokaryotic and eukaryotic cells. In addition, the students will examine the mechanisms by which materials are transported across membranes. This curriculum unit is designed to be a recurrent theme throughout the academic year rather than restricted to a limited timeframe. Material from this unit will be incorporated in the following units from the Planning and Scheduling Timeline for Chemistry, Unit 1: Matter and Energy, Unit 4: Ionic Bonds and Nomenclature, Unit 5: Covalent Bonds and Nomenclature, Unit 9: Intermolecular Forces, and Unit 11: Equilibrium and Chemical Kinetics (1). Even though this unit was developed for implementation in a chemistry classroom, it can very easily be adapted for use in a biology classroom.