

Biomedical Research Academy Unit 2 Lesson Plans
Cell Membrane structure and function
Mr. Rabold
9-9 thru 9-17-2014

2.1 A.P. Bio Membranes: Diffusion and Osmosis Lab pt. 1 Rabold

Objectives:SWBAT:

- describe the structure of membranes in biological systems
- relate the structure to the function of biological membranes
- explain underlying mechanisms for membrane transport

Standards: Acorn Book: 1-B Topics: subcellular organization, membranes

Process:

Art-

Lesson: Lecture/Discussion- Membranes-Functions and review structure and nature of phospholipids.

Lab: Introduction of next problem: What is the effect of sucrose concentration on the rate of osmosis through dialysis tubing?

Closure: Student questions and answers, discussion of the research question.

HW: Complete chapter 2 of lab (Review of Literature and hypothesis), work on Chapter 7 Guided Reading

Materials:

Consumables: dialysis tubing, alot of sucrose, potatos

Safety: goggles must be worn.

Terms:

Selectively permeable
Integral and peripheral proteins
Glycolipids and glycoproteins
Phospholipids
Hydrophobic
Hydrophilic

2.2 A.P. Bio Diffusion and Osmosis Rabold

Objectives:SWBAT:

- list factors affecting diffusion and osmosis
- define hypertonic, hypotonic, and isotonic
- explain the concept of water potential and solute potential

Standards: Acorn Book: 1-B Topics: subcellular organization, membranes

Process:

Lesson: Lecture/Discussion-Diffusion and Osmosis

Lab: Discussion of student research from homework, discuss hypotheses (null and alternative from statistical standpoint), how to decide on a statistical test to apply to this lab.

Closure: Discussion of lab. Answers to student questions. Student responses to lab questions.

HW: Begin draft of chapter 3 of lab. Guided reading Chapter 7.

Materials: As per lab

Consumables: sucrose, dialysis tubing, string

Safety: Use of plastic cups, and no dangerous chemicals poses no threat to students, standard lab guidelines apply.

Notes:

Terms:

Diffusion/osmosis
solute
pressure
concentration gradient
solute size

2.3 A.P. Bio Water Potential Rabold

Objectives:SWBAT:

- list factors affecting diffusion and osmosis
- define hypertonic, hypotonic, and isotonic
- explain the concept of water potential and solute potential

Standards: Acorn Book 1-B Topics: subcellular organization, membranes

Process:

Lesson: Lecture/Discussion-Diffusion and Osmosis/Water potential

Lab: Plan/write chapter 3 with your partner. Things to consider:

- Concentrations to use
- How to measure osmosis?
- Amounts of solutions to use?
- Levels of your I.V.?
- Trials?
- Controlled variables list

Closure: Discussion of lab. Answers to student questions. Student responses to lab questions.

HW: Finish draft of Chapter 3, guided reading chapter 7.

Materials: As per lab

Consumables: sucrose, dialysis tubing,

Safety: Use of plastic cups, and no dangerous chemicals poses no threat to students, standard lab guidelines apply.

Notes: Students working water potential section of lab.

Terms:

- solute
- pressure
- concentration gradient
- solute size

2.4 A.P. Bio.**Cell Transport****Rabold****Objectives:**SWBAT:

- explain the mechanism of transport in cell membranes
- relate the structure to the function of membranes in terms of transport
- describe methods of cellular transport other than diffusion and osmosis

Standards: Acorn Book: I-B Membranes

Process:

Lesson: Lecture/Discussion-Cellular Transport. Group activity demonstrating Various methods of cell transport.

Lab: Share your chapter 3 with another group for feedback, finalize chapter 3, create your data table, perform trial run as needed.

Teacher demo: Set up potato concentration lab for demo.

Closure: Student questions and answers, answers to lab questions.

HW: Type Chapter 1, 2, and 3, to be checked tomorrow.

Materials: As per lab

Safety: Use of plastic cups, and no dangerous chemicals poses no threat to students, standard lab guidelines apply.

Notes:

Terms:

facilitated diffusion
 active transport
 intergral membrane proteins
 gated ion channels

2.5 A.P. Bio.

Osmosis Lab

Rabold

Objectives:SWBAT:

- explain the structure of membranes in cells
- relate the structure to the function of membranes
- describe the structural integrity of membranes
- define and explain the concepts of diffusion and osmosis
- observe diffusion and osmosis occurring
- describe factors affecting rate of diffusion

Standards: Acorn Book: 1-B Topics: subcellular organization, membranes

Process:

Lab Data Collection day. Work on Chapter 4.

Closure: Discussion of lab results from today, collection of class data if possible.

HW: Quiz on Chapter 7 for tomorrow. Work on Chapter 4 of lab.

Materials: As per Diffusion and Osmosis lab.

Consumables: sucrose, glucose, IKI, dialysis tubing, string, potatoes, onion,

Safety: goggles, sharp objects, irritant chemicals. Review proper care when using these things.

Terms:

diffusion

osmosis

Fluid Mosaic Model

integral membrane proteins

peripheral membrane proteins

oligosaccharides

2.6 A.P. Bio.

Quiz-Membrane Structure and Function

Rabold

Objectives:SWBAT:

- evaluate their understanding of the cell structure and function unit
- review concepts of the unit
- practice test taking skills

Standards: Acorn book: 1-B Membranes, subcellular organization

Process:

Quiz-Cell membrane structure and Function

Lab data processing and analysis. Finish Chapters 4 and 5.

Closure: This exam is closure to unit on Membrane structure and function.

HW: Lab due Wednesday. Begin guided reading for Chapter 6

Materials:

Notes:

Terms: