

Osmosis Simulator Activity: Water Movement Across Membranes

Middle School (NGSS Aligned) Teacher Guide

Overview

This guide supports implementation of the Osmosis Simulator Activity: Water Movement Across Membranes using the 5E instructional model.

Learning Objectives

- Students will observe how water moves in and out of cells
- Students will identify the three types of solutions that affect cells
- Students will explain why cells need the right amount of water
- Students will predict what happens to cells in different environments

Standards Alignment

- **MS-LS1-2:** Develop and use a model to describe the function of a cell
- **MS-LS1-3:** Use argument supported by evidence for how the body is a system

Prerequisites

- Basic cell structure knowledge
- Understanding that cells need water
- Concept of particles and movement

Time Estimate

45 minutes

Materials Needed

- Computer/tablet with internet access
- Student Activity Sheet
- Colored pencils
- Optional: Gummy bears for demo

Teaching Tips by Phase

Phase 1: ENGAGE (5-10 minutes)

- Start with the phenomenon or problem presented
- Elicit student predictions and prior knowledge
- Create cognitive dissonance if possible
- Build excitement for investigation

Phase 2: EXPLORE (15-20 minutes)

- Allow students to investigate with minimal guidance
- Circulate and ask probing questions
- Encourage systematic data collection
- Note common discoveries and difficulties

Phase 3: EXPLAIN (10-15 minutes)

- Have students share their findings first
- Build on their observations to introduce concepts
- Address misconceptions directly
- Connect to broader biological principles

Phase 4: ELABORATE (10 minutes)

- Apply knowledge to new scenarios
- Make real-world connections
- Encourage deeper investigation
- Support transfer of learning

Phase 5: EVALUATE (5-10 minutes)

- Use varied assessment strategies
- Focus on conceptual understanding
- Provide immediate feedback
- Plan follow-up based on results

Remember:

The goal is student discovery through guided inquiry. Resist the urge to explain concepts before students have explored them!

Visit PEEBEDU.COM for more interactive science activities.