

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Section: \_\_\_\_\_

## Osmosis Simulator Activity

### Investigating Osmosis: Water Movement Across Membranes

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#### Phase 1: ENGAGE (3 minutes)

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**Getting Started:** Open [peebedu.com](http://peebedu.com) and navigate to Osmosis Simulation

Observe the red blood cell in the center.

**Essential Question:** How does changing the solution concentration affect cells? \_\_\_\_\_

**Initial Prediction:**

If you put a cell in pure water, it will:

## Phase 2: EXPLORE (12 minutes)

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### Investigation: Test Different Solutions

Use the slider to change solute concentration.

#### Part A: Extreme Conditions

##### Pure Water (0% solute):

- Cell appearance: -----
- Water moves: INTO / OUT OF cell
- Cell gets: BIGGER / SMALLER

##### High Salt (100% solute):

- Cell appearance: -----
- Water moves: INTO / OUT OF cell
- Cell gets: BIGGER / SMALLER

#### Part B: Finding Balance

Move slider slowly from 0 to 100:

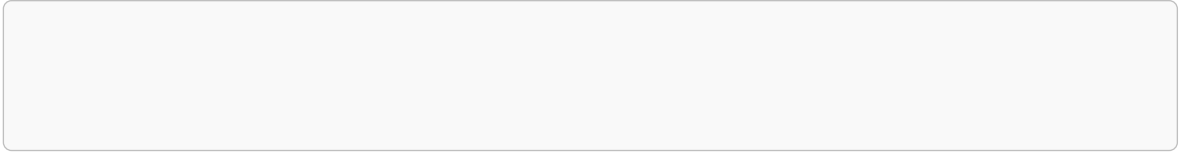
- At what range does the cell look normal? -----%
- Water movement at this point: BALANCED / ONE-WAY

#### Part C: Pattern Recognition

**The Rule of Water Movement:** Water always moves from:

**Visual Patterns:** Match the cell appearance to the solution type:

- Shriveled cell = ----- solution



- Swollen/burst cell = \_\_\_\_\_ solution

## Phase 3: EXPLAIN (7 minutes)

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### Understanding Osmosis

#### Why Water Moves:

Water moves to balance concentrations.

- More solute outside → Water moves -----

- Equal solute → Water moves -----

#### Cell Responses:

**Hypotonic** (low solute outside):

- Water rushes IN
- Cell swells
- May burst (lysis)

**Hypertonic** (high solute outside):

- Water rushes OUT
- Cell shrinks
- Membrane pulls away (crenation)

**Isotonic** (equal solute):

- Water moves equally both ways
- Cell stays normal
- Dynamic equilibrium

#### Why This Matters:

Cells must regulate water or they will:

## Phase 4: ELABORATE (2 minutes)

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### Real-World Applications

**IV Fluids:** Hospital IVs must be isotonic. Why? \_\_\_\_\_

**Preserving Food:** Salt preserves meat by creating a \_\_\_\_\_ environment. Why does covering food with salt help preserve it? What happens to bacteria when exposed to high salt concentrations?  
\_\_\_\_\_

**Plant Wilting:** Over-fertilizing creates hypertonic soil. Result: \_\_\_\_\_

## Phase 5: EVALUATE (1 minute)

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### Quick Check

A cell in seawater will:

Water moves toward areas of:

**Reflection:** Why can't you drink seawater when thirsty? \_\_\_\_\_