

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

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

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

## Osmosis Simulator Activity

### Understanding Osmosis: The Cell's Water Balance

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#### Phase 1: ENGAGE (8 minutes)

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

**First Observations:** What do you see in the simulation? List all components: \_\_\_\_\_

- \_\_\_\_\_

- \_\_\_\_\_

Move the slider to 50%. What do you notice about:

- Cell size: \_\_\_\_\_

- Label shown: \_\_\_\_\_

**Quick Predict:** What will happen if you move the slider to 0%? To 100%?

**Essential Question:** How does the concentration of solutes outside a cell affect the cell's size and health? \_\_\_\_\_

## Phase 2: EXPLORE (18 minutes)

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### Investigation: Testing Different Concentrations

Systematically test different solute concentrations and record your observations.

#### Data Collection Table:

#### Detailed Observations:

#### Hypotonic Solutions (0-40%):

- What happens to the cell? \_\_\_\_\_

- Describe water particle movement: \_\_\_\_\_

#### Isotonic Solution (~50%):

- Cell appearance: \_\_\_\_\_

- Why is this called 'normal'? \_\_\_\_\_

#### Hypertonic Solutions (60-100%):

- What happens to the cell? \_\_\_\_\_

- What's the wrinkled appearance called? \_\_\_\_\_

#### Pattern Discovery:

- As solute concentration increases, cell size \_\_\_\_\_

## Phase 3: EXPLAIN (15 minutes)

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### Understanding Osmosis

#### Define Key Terms:

**Osmosis:** The movement of \_\_\_\_\_ across a \_\_\_\_\_ membrane from an area of \_\_\_\_\_ solute concentration to an area of \_\_\_\_\_ solute concentration.

**Selectively Permeable:** Allows \_\_\_\_\_ to pass through but not most \_\_\_\_\_.

#### The Three Solution Types:

Draw and label a cell in each solution type:

- \_\_\_\_\_

Cell: normal [Drawing]

#### Problem Solving:

A cell starts at 100 pg mass in isotonic solution.

- Moved to 20% solution: New mass = \_\_\_\_\_ pg (increase/decrease?) \_\_\_\_\_

- Which change is more dangerous? Why? \_\_\_\_\_

#### Data Analysis:

From your data table, at what concentration is the solution isotonic? \_\_\_\_\_ %

How did you determine this? \_\_\_\_\_

#### Application:

You're watering a plant that looks wilted.

- Is the soil likely hypertonic or hypotonic? \_\_\_\_\_

- How long until the plant looks normal? \_\_\_\_\_

#### Critical Thinking:

Fish in the ocean don't swell or shrink. Explain how they maintain balance:

**Exit Ticket:**

In 2-3 sentences, explain why understanding osmosis is important for: Doctors: \_\_\_\_\_

Farmers: \_\_\_\_\_ You: \_\_\_\_\_

**Vocabulary Review:**

- **Osmosis:** Water movement across membranes
- **Hypotonic:** Lower solute concentration (cell swells)
- **Isotonic:** Equal solute concentration (cell normal)
- **Hypertonic:** Higher solute concentration (cell shrinks)
- **Selectively Permeable:** Allows some substances through
- **Homeostasis:** Maintaining stable internal conditions