Diffusion and Osmosis

What causes my plants to wilt if I forget to water them?

Name: _____ Date: _____ Class/period: _____

Dataset ID: _____

https://biologylabbench.com/lab04

How to use this guide

Check off each numbered step as you work in the online simulation. Follow your teacher's assigned sections and repeat counts. This guide explains the workflow; enter your measurements and responses in the lab or your assigned worksheet.

Use Data for tables and editable calculations, Graph for plots, and Scene for the simulation. Some controls are under More options. Write predictions before running an experiment and scroll below the simulation for response boxes.

Overview

- ☐ 1. Read the driving question and your teacher's assignment. Note which sections, optional extensions, and number of trials your teacher wants you to complete.
- ☐ 2. Sign in with your name and class period. Copy your Dataset ID onto this guide. Keep using the same dataset for the investigation; classmates may have different numbers.

Background

- ☐ 1. Read the background explanations, diagrams, and vocabulary. Review the reference formulas you will need and identify the variables you will measure.

Pre-lab

- ☐ 1. Complete the pre-lab questions and any practice activities. Use Check answer, read the feedback, and revise your reasoning before starting the investigation.

SA:V

- ☐ 1. Test the indicator by adding HCl and NaOH to the separate tubes. Record your observations and write a diffusion prediction.
- ☐ 2. Choose three blocks and a soak time, then Soak, cut, and measure. In Data, calculate surface area, volume, SA:V, and percent diffused for every block.
- ☐ 3. Use Check my calculations, revise flagged entries, inspect Graph, and answer the questions below.

Model cells

- ☐ 1. Predict the effects of the bag contents. Use Weigh, soak 30 min, re-weigh to collect measurements for all five bags.
- ☐ 2. Run the set at least twice for replicates. Calculate percent mass change for each bag in Data, use Check my % changes, and compare the graph before answering the questions.

Plasmolysis

- ☐ 1. Write your prediction. Choose a solution, then Add solution under cover slip. Focus the microscope and observe the cells during the simulated treatment.
- ☐ 2. Use Record this view, count plasmolyzed cells, and enter the count in Data. Test at least three solutions. If assigned, rinse with distilled water and record whether the appearance changes.

Water potential

- ☐ 1. Identify all six cups using the information and controls on the page. Select a tissue and run Weigh, soak overnight, re-weigh.
- ☐ 2. Run each assigned tissue twice for replicates. Calculate the mass changes and use the graph to estimate the isotonic concentration.
- ☐ 3. Use the page's temperature, units, and water-potential formulas to calculate ψS and tissue ψ. Enter your values and Check my calculation; explain your evidence.

Design

- [ ] 1. Write your question, hypothesis, variables, and control. Choose the independent variable and enter valid levels.
- [ ] 2. Run experiment, compare Graph and Data, and describe your results and whether they support the hypothesis.

Analyze

- [ ] 1. Answer every assigned analysis question using your own recorded data. Include numbers, units, and comparisons from the appropriate Data and Graph panels.
- [ ] 2. Complete the requested calculations or statistical comparisons. Show your method and explain what the result means biologically. Write the claim, evidence, and reasoning response if shown.

Evaluate

- [ ] 1. Compare your original predictions with your results. Explain any disagreement, limitations of the simulation, and one way to improve the investigation.
- [ ] 2. Complete the assigned reflection/evaluation questions and AP-style response if shown. Use your own data where requested. Rate your confidence if you wish; ask your teacher about any unfinished or unclear work.

Submit

- [ ] 1. Review the completion checklist and Preview my report. Check your name, period, Dataset ID, calculations, units, graphs, and written responses.
- [ ] 2. Download .docx or use Save as PDF as directed by your teacher. Open the downloaded file and check that it contains your work, then upload or hand it in where your teacher specifies. Downloading alone does not submit it.
- [ ] 3. Save a progress file using Move your work to another computer if you need a backup or will change devices. Keep recordings separately if assigned; a report cannot restore editable progress.

Teacher instructions / notes