Transpiration

What factors, including environmental variables, affect the rate of transpiration in plants?

Name: _____ Date: _____ Class/period: _____

Dataset ID: _____

https://biologylabbench.com/lab11

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.

Leaf area

- ☐ 1. Count full grid squares and squares crossed by the leaf edge. Enter both counts and Calculate and record.
- ☐ 2. Use Trace a different leaf, count again, and record at least three leaves. Review the areas and answer the questions about your measurement method.

Stomata

- ☐ 1. Write your prediction. Choose the species and leaf surface, use 400X, and adjust fine focus until the guard cells are clear. Click each stoma to tally it.
- ☐ 2. Record this field once. Use Move to a new field before counting and recording another replicate; repeated Record clicks do not create independent observations.
- ☐ 3. Record at least three fields for the same slide and surface at 400X. Calculate stomatal density from the mean count and field area, use Check, then compare surfaces/species as assigned and answer the questions.

Water loss

- ☐ 1. Write your prediction and record the plant, method, conditions, and replicate count. Run the control first, then a treatment with the same plant and method.
- ☐ 2. In Data, calculate rate ÷ leaf area for every plant using the unit scale shown, then Check my rate/area values.
- ☐ 3. Compare the time graph and adjusted-rate summaries. Keep method-specific units distinct and explain how the treatment compares with its control.

Design

- ☐ 1. Write your question, hypothesis, variables, and constants. Change one factor and include a default-condition control.

- [ ] 2. Run replicates for at least two groups. Choose Group A and B for the t-test when each has sufficient replicate data. Report rates, units, variability, and the conclusion supported by your comparison.

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