Photosynthesis

What factors affect the rate of photosynthesis in living leaves?

Name: _____ Date: _____ Class/period: _____

Dataset ID: _____

https://biologylabbench.com/lab05

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.

Sink disks

- ☐ 1. Set up the bicarbonate and water-control cups as shown. Add the indicated drop of soap to wet the leaf surfaces.
- ☐ 2. Pull vacuum, release, and repeat until the disks sink. Use Pour to place the prepared disks into the two cups. Complete this preparation before starting Float assay.

Float assay

- ☐ 1. Write your prediction and confirm the disks have been sunk and poured. Set the assay conditions and Start timer; follow the automatically recorded floating counts in Data.
- ☐ 2. Run long enough to evaluate whether half the disks float, up to the available observation limit. Record the number of disks, conditions, duration, and counts for each cup.
- ☐ 3. Calculate ET_{50} and $1/ET_{50}$ from your own counts and check them using the page controls. If half never float, report that ET_{50} exceeds the observation time; do not invent a measured ET_{50} or zero rate. Answer the procedure questions.

Design

- ☐ 1. Write your question and hypothesis. Choose one variable and valid levels, keep other conditions constant, and include controls and replicate cups.
- ☐ 2. Use Run all cups. Compare the recorded counts, ET_{50} results, and Graph. Treat cups that never reach half floating as censored observations, then explain your findings and limitations.

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