Energy Dynamics

What factors govern energy capture, allocation, storage, and transfer between producers and consumers in a terrestrial ecosystem?

Name: _____ Date: _____ Class/period: _____

Dataset ID: _____

https://biologylabbench.com/lab10

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.

Part 1: NPP

- ☐ 1. Write your diagram prediction. Advance the plants to at least day 7, then Harvest to blot and weigh the first set. Use Dry 48 h to obtain dry masses.
- ☐ 2. Advance to about day 14 or later and harvest and dry another set. In Data, calculate the requested percent biomass, stored energy, and NPP summary values using the supplied conversion factor.
- ☐ 3. Measure dark respiration with Seal 5 plants on the same day as a harvest. Complete the NPP, respiration, and GPP calculations and answer the questions about dry mass and uncertainty.

Part 2: Larvae

- ☐ 1. Predict the energy flow in the larva diagram. Use Day 0: weigh, then feed to run the three-day barn experiment.
- ☐ 2. Run at least three barns for replicate data. Record food, larvae, frass, and control measurements in Data.
- ☐ 3. Work through the energy audit for barn 1 using the supplied energy conversion factors. Apply the evaporation correction as requested and calculate consumption, growth, frass, respiration, and efficiencies. Answer the comparison questions.

Design

- ☐ 1. Write your question and hypothesis. Select an organism, one independent variable, and at least two levels including the standard condition; describe controls and constants.
- ☐ 2. Run experiment and compare Graph and Data. Record your settings, replicate results, and units, then explain the energy pattern and uncertainty.

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.

Reflect

- [ ] 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