Cellular Respiration

What factors affect the rate of cellular respiration in multicellular organisms?

Name: _____ Date: _____ Class/period: _____

Dataset ID: _____

https://biologylabbench.com/lab06

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.

Microrespirometer

- ☐ 1. Write your prediction. Keep equilibration and the insulated bath enabled for the first comparison; record your organism, temperature, and other settings.
- ☐ 2. Start 25-min run. In Data, calculate the change during each interval and the corrected seeds-minus-beads values in the editable columns. Use Check my calculations.
- ☐ 3. Open Graph and determine the oxygen-uptake rate from the fitted slope. Enter the rate with units and check it. Repeat for three runs if your teacher assigns the mean and SE comparison.

Gas sensors

- ☐ 1. Write your prediction and choose the sensor and chamber contents. Press Collect data and review the resulting graph and table.
- ☐ 2. Repeat with all three sensors. If assigned, compare germinating peas with glass beads and KOH on versus off. Record the sensor, units, conditions, and observed direction and rate of change.

Design

- ☐ 1. Write the proposal, including a question, hypothesis, variable, control, and constants. Choose the organism and conditions, using at least three replicate respirometers per run.
- ☐ 2. Run trial(s), change only your independent variable, and collect the comparison groups. Group the graph by that variable and report rates with units, variability, one sample calculation, and a conclusion.

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