Enzyme Activity

How do abiotic or biotic factors influence the rates of enzymatic reactions?

Name: _____ Date: _____ Class/period: _____

Dataset ID: _____

https://biologylabbench.com/lab13

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.

Procedure 1

- ☐ 1. Write your enzyme-versus-control prediction. Review the tube recipes and choose palette or spectrophotometer measurement before starting the trial.
- ☐ 2. Combine tubes & start timer. In palette mode, compare each recorded tube image with the palette and enter colors for enzyme and control at every time in Data. In spectrophotometer mode, review the recorded absorbances instead.
- ☐ 3. Use Graph to compare initial slopes and Data to check time points. Select a baseline time for later assays and explain your choice and constants. Repeat the trial if assigned.
- ☐ 4. Keep units tied to the method: palette levels/min and absorbance change/min are different measures. Small negative blank-corrected absorbances can reflect noise near zero; an endpoint reading ratio is not a rate ratio.

Procedure 2: pH

- ☐ 1. Complete Procedure 1 first so you can choose a baseline time. Predict the pH response, select buffers, and keep other recipe components and reading times constant.
- ☐ 2. Use Combine all pairs & start. Run at least three trials. Enter each palette reading in Data if using the color method; otherwise review the absorbance-change readings.
- ☐ 3. Compare the graph, identify the greatest measured response from your own data, and describe the pH pattern and variation.

Design

- ☐ 1. Write your question, hypothesis, variables, controls, and constants. Choose one variable and at least two valid levels with a comparison/control condition.
- ☐ 2. Run experiment and compare Graph and Data. Use comparable time intervals and the same measurement method to calculate rates; report the pattern, variability, and evidence supporting your 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.

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