Practice: cells, molecules and enzymes

Student activity • observation and reasoning

YEAR 10 / LESSON 14 / BIOLOGY + SCIENCE (DOUBLE AWARD)

The question

Can you support each answer with a biological reason or calculation?

Use the supplied examples, record your reasoning and correct it using evidence.

Equipment

- Student booklet, paper models, pencil and ruler

Paper, modelling and written reasoning only. No chemicals or biological samples are handled.

Course coverage: Original practice covering 1.1–1.4 and 2.1–2.13; optional Biology extension.

Plan, model or apparatus sketch

Draw and label the apparatus or biological model; identify one limitation.

Method and reasoning

Read the whole sequence before starting

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1. Work independently for 25 minutes on the six questions, using labelled diagrams and units. These are original practice questions, not a past examination paper.

2. Use the supplied fictional observations and times only where a question refers to them. Do not present them as your own results.

3. Check command words: name requires an identification; explain requires a linked reason; calculate requires working and a unit.

4. Compare answers with the separate teacher guide. Add corrections in a different colour and explain the reason for each change.

5. Classify each error as knowledge, interpretation, calculation or communication, then practise one similar explanation without copying.

6. Write two revision targets with a concrete task and a way to check success.

Cleanup

- Return models and keep the corrected work.

Record your evidence

Blank spaces are for your own work

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Reference and task data

Practice evidence: an unknown cell has a cellulose wall, a large vacuole and no visible chloroplasts. Food sample X gives blue-black with iodine and remains blue with Benedict's after valid control tests. Enzyme endpoint times at one temperature are 80, 100 and 120 s. These are invented assessment examples.

Example / trial	Observation / evidence	Explanation / limit
Question / initial answer		
Correction / supporting reason		
Revision task / success check		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

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1. Classify the cell as plant or animal and give two reasons.

2. Why does absence of visible chloroplasts not rule out a plant cell?

3. What do the two food tests suggest about X?

4. Calculate the mean endpoint time and the reciprocal of that mean.

5. Explain why three repeats improve the evidence but do not remove all error.

6. Explain why increasing temperature can first increase and then decrease enzyme activity.