Review: cells, molecules and enzymes

Student activity • observation and reasoning

YEAR 10 / LESSON 13 / BIOLOGY + SCIENCE (DOUBLE AWARD)

The question

Which explanations connect cell structure, biological molecules and enzyme action?

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: Review of 1.1–1.4 and 2.1–2.14B; Biology extensions marked.

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. Without notes, draw an animal, photosynthetic plant and bacterial cell; identify structures shared by all three and structures not shared.

2. Build a concept map connecting ribosomes, proteins, enzymes, active sites and metabolism. Add chloroplasts and mitochondria with distinct functions.

3. Compare starch, protein and lipid using their smaller components and appropriate food-test evidence.

4. Explain the temperature profile from Lesson 9 and distinguish it from the actual endpoint evidence from Lesson 10.

5. Correct the statements “all plant cells have chloroplasts”, “a bacterium has no DNA”, and “a positive Benedict’s test proves glucose”.

6. Biology extension: connect differentiation to specialised function and outline one stem-cell benefit and one concern. Identify two targets for revision.

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

This is retrieval and correction, not a repeat wet practical. Use your own prior observations where available. Treat supplied model data as model data. Shared core covers cell structures, molecules and enzyme explanations; stem-cell and differentiation details and the pH practical are Biology extensions.

Example / trial	Observation / evidence	Explanation / limit
Cell comparison		
Molecules / food-test evidence		
Corrections / next targets		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

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1. Name three structures found in plant, animal and bacterial cells.

2. Explain why plants need mitochondria.

3. Match starch, protein and lipid to smaller components.

4. What does a positive Benedict’s test establish?

5. Contrast low temperature with denaturation.

6. Biology: explain differentiation without saying all unused genes are lost.