Review: transport and respiration

Student activity • observation and reasoning

YEAR 10 / LESSON 25 / BIOLOGY + SCIENCE (DOUBLE AWARD)

The question

How do exchange and respiration support one another?

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: Shared Biology / Double Award: review of 2.15–2.17, 2.34–2.39 and 5.5–5.8.

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. Draw a map linking glucose and oxygen uptake, respiration, ATP and active transport. Show which movements can occur passively.

2. Compare diffusion, osmosis and active transport using direction, substance and energy requirements.

3. Interpret a fictional potato mass change from 1.20 to 1.08 g and explain the sign in terms of net water movement.

4. Compare aerobic respiration with muscle anaerobic respiration and yeast fermentation; keep their products separate.

5. Evaluate the seed and dough investigations: identify controls and distinguish measured evidence from expected mechanisms.

6. Write two corrections to earlier work and one testable improvement to an investigation.

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 value only: potato mass changes from 1.20 g to 1.08 g. Use genuine class records when discussing the seed and dough work. ATP supply links respiration to energy-requiring transport, while diffusion and osmosis are passive.

Example / trial	Observation / evidence	Explanation / limit
Transport / ATP links		
Calculation / explanation		
Investigation control / improvement		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

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1. Calculate the percentage potato mass change.

2. What does the negative sign indicate?

3. Why can active transport continue against a gradient?

4. Give the balanced aerobic equation.

5. What product differs between muscle anaerobic respiration and yeast fermentation?

6. Name one control needed when comparing seed-flask temperatures.