Comparing energy requirements

Student activity • observation and reasoning

YEAR 10 / LESSON 50 / BIOLOGY + SCIENCE (DOUBLE AWARD)

The question

Why do people's energy requirements differ?

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: 2.26. Activity, age and pregnancy.

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

YEAR 10 / LESSON 50 / BIOLOGY + SCIENCE (DOUBLE AWARD)

1. List processes that require energy even at rest, then explain how physical activity adds demand.

2. Compare fictional people who differ in activity, growth stage or pregnancy; avoid inferring an exact requirement from age alone.

3. Explain why growth and pregnancy involve building new tissue as well as maintaining existing tissue.

4. Use an invented food label showing 800 kJ per 100 g to calculate energy in a 35 g serving.

5. Distinguish kJ from kcal and show a conversion using 1 kcal = 4.184 kJ if required.

6. Explain why energy requirement is not a measure of a person's worth or a personalised diet target; several biological and lifestyle factors interact.

Cleanup

- Return models and keep the corrected work.

Record your evidence

Blank spaces are for your own work

YEAR 10 / LESSON 50 / BIOLOGY + SCIENCE (DOUBLE AWARD)

Reference and task data

The fictional label is arithmetic practice, not a recommended intake. Requirements depend on body size, activity, growth and physiological state. Pregnancy does not mean doubling food intake. Use general comparisons, not personal calorie targets or collection of students' body measurements. Fictional comparison: Alex and Sam are adults of similar size; Alex has a mostly seated day while Sam completes several hours of physical work. Compare likely activity-related demand while recognising unreported factors. Then explain the extra processes involved in growth and pregnancy without assigning numerical intake targets.

Example / trial	Observation / evidence	Explanation / limit
Evidence / comparison		
Explanation		
Limit / correction		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

YEAR 10 / LESSON 50 / BIOLOGY + SCIENCE (DOUBLE AWARD)

1. Name an energy use at rest.

2. How does activity change demand?

3. Why can growth raise demand?

4. Calculate energy in the 35 g serving.

5. Is a kcal the same as a kJ?

6. Why is age alone insufficient?