Characteristics of living organisms

Student activity • observation and reasoning

YEAR 10 / LESSON 1 / BIOLOGY + SCIENCE (DOUBLE AWARD)

The question

Is movement alone evidence that something is alive?

Compare organisms, dormant seeds and non-living systems using a set of characteristics rather than one visible behaviour.

Equipment

- Student booklet, pencil, ruler and coloured pencils
- Blank paper cards or reusable modelling pieces

Use paper or clean reusable models. No body samples, microbial cultures or unknown biological material are handled.

Course coverage: Shared Biology / Double Award: 1.1. Eight characteristics, including control of internal conditions.

Plan, model or apparatus sketch

Draw a labelled model that explains the evidence; state what the model cannot show.

Method and reasoning

Read the whole sequence before starting

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1. Make eight headings: nutrition, respiration, excretion, sensitivity, movement, homeostasis, reproduction, and growth/development.

2. For a bean plant, give a biological example under every heading. Include movement through growth, not just locomotion.

3. Compare a car: it moves and uses fuel, but does not have cellular metabolism, biological reproduction or development.

4. Consider a dry viable seed. Explain why lack of visible movement during a short observation does not establish that it is dead.

5. Distinguish removal of metabolic waste from removal of undigested food, and cellular respiration from breathing.

6. Write a justified conclusion explaining why evidence across the life processes and time is needed.

Cleanup

- Return reusable materials and retain your corrected reasoning.

Record your evidence

Blank spaces are for your own work

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Reference and task data

Supplied reasoning examples: a bean plant grows towards light; a car travels using fuel; a viable seed can remain dormant before germination. These are written examples, not class measurements. Homeostasis maintains internal conditions within limits rather than making every variable exactly constant.

Example / task	Evidence / drawing	Reason / limitation
Bean plant		
Dormant seed		
Car		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

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1. List the eight characteristics.

2. Explain plant movement without locomotion.

3. How does respiration differ from breathing?

4. How does excretion differ from egestion?

5. Why can a dormant seed be alive?

6. Why is a moving car not classified as an organism?