Energy transfer and pest control

Teacher / technician

YEAR 11 / LESSON 107 / BIOLOGY + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. Original learning tasks; no supplied numerical example represents class measurements.

Coverage and delivery

Shared Biology / Double Award: 4.7–4.9 and 5.4. Transfer efficiency and crop protection.

Allow about 60 minutes. Follow the student sequence and use the answers to check reasoning.

Requisition • class of 30, working in 15 pairs

Item	Per pair / setup	Class total
Student booklets	1 per learner	30
Energy-flow diagram and crop-pest scenario cards	1 set per pair	15 sets
Rulers	1 per pair	15

Immediate safety

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

Preparation and delivery

Read alongside the student method

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1. Provide 30 booklets, 15 rulers and 15 sets of energy-flow diagram and crop-pest scenario cards.

2. Keep answers separate until learners have attempted the tasks; discuss the reasons for corrections.

3. Provide the 10000 kJ input and 800 kJ new-biomass example and the stated cabbage/aphid scenario. This is paper comparison only; no pesticide application or release of organisms.

Close of lesson

• Return models and keep the corrected work.

Check before teaching

Check the cards, reference data and quantities against this requisition. Keep the staff answer guide separate until the checking stage. Supplied numerical practice datasets are labelled examples; they are not class measurements.

Answers and teaching notes

Expected explanations • do not give as experimental observations

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- 8%.
- Some material is not digested or absorbed.
- It is ultimately dissipated as heat.
- No.
- Resistance or harm to non-target organisms, depending on application.
- The control organism may affect non-targets or be difficult to remove.

References and provenance

Pearson Biology specification

Prepared 22 November 2026. Original wording, tables and questions. Sources inform the concepts and technique; the lesson scope and classroom quantities are explicitly described here. No laboratory trial or final school risk approval is claimed.