

Energy transfer in ecosystems: practice questions

4 questions • 8 marks • mark scheme at the back

For Edexcel GCSE Biology 1BI0 and Combined Science 1SC0. **Triple only** is not in Combined Science. **Higher tier** is only on the Higher paper.

Name

Total / 8

1 **Triple only** [1 mark]

Food chains rarely have more than five trophic levels because

- A. ☐ there is too little light for plants
- B. ☐ too little energy is left to support more trophic levels
- C. ☐ predators eat too many organisms
- D. ☐ plants cannot grow near large animals

2 **Triple only** [3 marks]

In a field, the biomass of the grass is much greater than the biomass of the cows that eat it. Explain why.

3 **Triple only** [2 marks]

A field of grass contains 12 500 kJ of energy in its biomass. Rabbits eating the grass gain 1 500 kJ. Calculate the percentage efficiency of the energy transfer from grass to rabbits.

Answer =

4

Triple only

[2 marks]

A caterpillar eats 50 g of leaf (dry mass). Its own dry mass increases by 8 g. Calculate the percentage of the dry mass of leaf eaten that becomes caterpillar biomass.

Answer =

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1] Triple only

B too little energy is left to support more trophic levels (1)

2. [3] Triple only

- some of the grass is not eaten / some is not digested and is lost in faeces (1)
- energy is released by respiration and transferred to the surroundings as heat (1)
- energy is used for movement / keeping warm / lost in urine (1)
- so less energy / biomass is available at the next trophic level to support cows (1)
- Max 3

3. [2] Triple only

- $1\,500 \div 12\,500 \times 100$ (1)
- = 12 % (1) award 2 marks for a correct answer with no working

4. [2] Triple only

- $8 \div 50 \times 100$ (1)
- = 16 % (1) award 2 marks for a correct answer with no working