

## Class 4 Science Assessment: Energy in Ecosystems

*Learning objective: To identify and describe the roles of producers, predators, and prey within a food chain and understand the impact of environmental changes.*

Read each question carefully. Use the word bank to help you with scientific vocabulary. Ensure your answers are clear and written in full sentences where required.

Bea the honeybee is studying the woodland meadow. She observes that the sun provides energy for the green plants to grow. A small caterpillar eats the leaves of a plant. A blue tit bird then catches the caterpillar for its lunch. Finally, a sparrowhawk swoops down to hunt the blue tit. Bea notes that if one part of this chain is removed, the entire balance of the meadow changes.

*Word bank: Producer · Consumer · Herbivore · Carnivore · Omnivore · Predator · Prey · Habitat · Energy transfer*

**1. Identify the producer in the food chain described in the passage. Explain why it is given this title. (2 marks)**

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**2. Classify the caterpillar and the sparrowhawk as either a herbivore, carnivore, or omnivore. Justify your choices. (2 marks)**

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**3. Draw a food chain using the following organisms: grass, fox, rabbit. Ensure your arrows point in the correct direction to show the flow of energy. (2 marks)**

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**4. What do the arrows in a food chain represent? Why is it important that they point from the prey to the predator? (2 marks)**

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**5. Explain why a predator is essential for maintaining a healthy population of prey within an ecosystem. (3 marks)**

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**6. Compare and contrast the diet of a herbivore and an omnivore. Provide one example for each. (3 marks)**

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**7. What might happen to the fox population if a disease caused all the rabbits in the meadow to disappear? Justify your prediction using your knowledge of food chains. (3 marks)**

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**8. Extended Writing Task: Nova the owl is worried about the impact of humans building a new road through the middle of the meadow. Write a report explaining how habitat destruction affects food chains. Include how it might impact both the producers and the top predators. (5 marks)**

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**Draw:** In the space below, draw a complex food web involving at least five different organisms, including one plant, two herbivores, and two carnivores. Label each organism correctly.



*Extension challenge: Total: /25. Extension Task: Imagine a new species is introduced to an environment. Research or hypothesise how an 'invasive species' could disrupt the energy transfer in an existing food chain. Write a short paragraph explaining the potential consequences for the native wildlife.*