Nova’s Nature Trails: Mastering Food Chains

Learning objective: To construct and interpret food chains, identifying producers, primary consumers, and predators within a habitat.

Read the questions carefully and use your scientific knowledge of food chains to provide detailed explanations. Remember to use the correct terminology when describing the flow of energy.

Nova the owl is observing the woodland habitat. She notes that the sun provides energy for the oak tree. A squirrel eats the acorns from the tree, and a fox occasionally hunts the squirrel to survive. In the pond nearby, algae grow using sunlight, which are eaten by small water fleas, which are then consumed by a hungry minnow.

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

1. Identify the 'producer' in the woodland food chain mentioned in Nova’s observation. Explain why plants are classified as producers. (2 marks)

2. Using the pond habitat, construct a food chain using the three organisms mentioned (algae, water fleas, minnow). Use arrows to show the direction of energy transfer. (2 marks)

3. In the chain: Oak Tree -> Squirrel -> Fox, identify which animal is the prey and which is the predator. What might happen to the fox population if the squirrel population suddenly decreased? (3 marks)

4. Compare and contrast a herbivore and a carnivore. Why is it essential for a food chain to start with a producer? (3 marks)

5. Justify your answer: Is a human being a producer or a consumer? Explain your reasoning based on how we obtain energy. (2 marks)

Draw: Draw a food chain that you might find in a garden. Include at least four organisms, starting with a producer (like a flower or grass) and ending with an apex predator. Label each organism correctly using the terms 'producer', 'primary consumer', 'secondary consumer', and 'tertiary consumer'.

Extension challenge: Nova asks: 'What might happen to the balance of a woodland habitat if a disease wiped out all the predators?' Write a short paragraph explaining the potential long-term effects on the producers and the primary consumers. Use your knowledge of population control to support your argument.