

The Meadow Mystery: Mapping Energy Flows

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

Nova the barn owl is studying the meadow ecosystem. Below is a list of organisms found in the meadow. Use your knowledge of life cycles and habitats to sequence them into three distinct food chains. Then, draw arrows between them to show the direction of energy transfer (remember, the arrow points to the animal that is doing the eating!).

Word bank: Producer · Primary Consumer · Secondary Consumer · Tertiary Consumer · Predator · Herbivore · Carnivore · Energy Transfer

1. Arrange these organisms into a logical food chain: Field Mouse, Hawk, Grass, Grasshopper. Label each organism as a producer, primary consumer, secondary consumer, or tertiary consumer. (3 marks)

2. Explain why plants are considered 'producers' in every food chain. Where do they get their initial energy from? (2 marks)

3. Justify your answer: What might happen to the population of field mice if the hawk population in the meadow were to suddenly decrease? (3 marks)

4. Compare and contrast a herbivore and a carnivore. Which one occupies a higher trophic level, and why? (3 marks)

5. If a farmer sprayed pesticides on the grass, how might this affect the top predator (the hawk)? Explain the chain reaction. (3 marks)

6. Nova observes a beetle eating a leaf, and then a shrew eating the beetle. Construct this chain and identify the apex predator if a snake arrives to eat the shrew. (2 marks)

Draw: Draw a 'Food Web' for the meadow. Include at least two producers, three herbivores, and two predators, using arrows to show how energy moves through the ecosystem.



Extension challenge: Research a woodland habitat. Create a complex food web that includes at least six different animals and two types of plants. Write a paragraph justifying why a food web is a more accurate representation of nature than a single, simple food chain.