

Nova's Life Cycle Investigation

Learning objective: To describe the differences in the life cycles of a mammal, an amphibian, an insect, and a bird, and identify the processes of reproduction.

Nova the Owl has been observing the local woodland. She has collected notes on four different species: a red squirrel, a common frog, a cabbage white butterfly, and a tawny owl. Your task is to sort the key life cycle stages and characteristics for each, then use your biological knowledge to answer the analytical questions below.

Word bank: Metamorphosis · Gestation · Incubation · Larva · Mammal · Amphibian · Pupa · Reproduction

1. Compare and contrast the life cycles of the common frog and the tawny owl. Explain why the frog's life cycle is described as metamorphosis while the owl's is not. (3 marks)

2. A red squirrel is a mammal. Explain why a squirrel does not need to undergo a larval stage like a butterfly does. (2 marks)

3. Justify why the process of reproduction is essential for the survival of these species within their woodland habitat. (2 marks)

4. What might happen to the butterfly population if the specific plants they lay their eggs on were removed from the ecosystem? (2 marks)

5. If a tawny owl lays three eggs, but the environmental conditions are extremely cold during the incubation period, predict the potential outcome for the offspring and explain your reasoning. (3 marks)

6. Identify one key difference between the birth of a mammal and the hatching of an insect. Use the terms 'gestation' or 'larva' in your answer. (2 marks)

Draw: Create a detailed, labelled diagram comparing the life cycle of a butterfly (metamorphosis) with the life cycle of a mammal (direct development). Use arrows to show the direction of growth and highlight the stages where the organism is most vulnerable to predators.



Extension challenge: Design a 'Life Cycle Fact File' for a creature of your choice that is not mentioned here. You must include the name of the animal, its classification (e.g., insect, bird, fish), and a detailed step-by-step breakdown of its reproduction and development stages. Include an evaluation of how this creature has adapted its life cycle to survive in its specific environment.