

Autumnal Science: Nature's Seasonal Transformation

Learning objective: To assess understanding of life cycles, seasonal changes in plants and animals, and the physical properties of light and heat during the autumn months.

Read each question carefully. Use your scientific knowledge to provide detailed explanations. Ensure your answers are clear and written in full sentences.

As the Earth tilts on its axis, the United Kingdom experiences the transition into autumn. For many plants and animals, this is a critical period of preparation. Deciduous trees undergo physiological changes as daylight hours shorten, while various species of wildlife adapt their behaviours to survive the impending winter.

Word bank: chlorophyll · deciduous · dormancy · migration · photosynthesis · temperature · hibernation · environment

1. Explain why the leaves of deciduous trees change colour from green to shades of yellow, orange, and red during autumn. (2 marks) (2 marks)

2. Nova the owl has noticed that many animals are preparing for winter. Describe the difference between 'hibernation' and 'migration' as survival strategies. (4 marks) (4 marks)

3. Max the monkey is calculating the changes in daylight. Explain why the reduction in sunlight hours affects the process of photosynthesis in plants. (3 marks) (3 marks)

4. Bea the honeybee observes that some insects enter a state of 'dormancy'. What is dormancy, and why is it essential for their survival during the colder months? (3 marks) (3 marks)

5. Compare and contrast the adaptations of a squirrel gathering nuts with a tree shedding its leaves. How do both actions help the organism survive the winter? (4 marks) (4 marks)

6. Justify why it is scientifically advantageous for many plants to drop their leaves rather than keeping them throughout the winter months in the UK. (4 marks) (4 marks)

7. Extended Response: Imagine you are a scientist observing a local woodland ecosystem. Write a report explaining the interconnected relationship between shortening daylight, falling temperatures, and the behaviour of woodland wildlife. (5 marks) (5 marks)

Draw: Draw a labelled diagram showing the life cycle of a deciduous tree throughout the four seasons, focusing specifically on the structural changes visible during autumn.



Extension challenge: Total: /25. Research Task: Investigate the 'first frost'. What might happen to a plant's cells if the water inside them freezes? Write a short paragraph explaining the danger of ice crystals to plant tissue.