



Year 9 Learning Journey

Autumn Term

Ecology

Core knowledge
1. State that the individuals in a population are likely to vary from one another genetically.
2. Distinguish between continuous and discontinuous variation.
3. Identify and give examples of inherited variation and explain how its caused.
4. Identify the physical environmental factors that make up the environment in a habitat and describe how these factors can vary, both on a daily basis and seasonally.
5. Describe the adaptations of a range of organisms to their habitats.
6. Explain how particular adaptations increase the chances of survival, while others can limit an organism's distribution and abundance
7. Describe physical and behavioural adaptations of organisms to daily and seasonal changes, including deciduous and evergreen trees, nocturnal organisms, hibernation and migration.
8. Identify and give examples of environmental variation.
9. Describe the causes of environmental variation (differences in the environment, acquired characteristics).
10. State the resources that organisms need from their habitats and ecosystems.
11. Explain why organisms are in competition in a given habitat.
12. Use a food web to identify food sources for different animals and give reasons for identifying organisms as: carnivores, consumers, herbivores, omnivores, predators, prey, producers.
13. Explain the gains and losses of energy from living organisms.
14. Interpret and compare models of energy transfer in food chains (pyramids of number, biomass).
15. Explain why preserving biodiversity is important (useful products, organism interactions, enriches our lives, disaster recovery).
16. Explain how biodiversity can be preserved using gene banks, seed banks, tissue banks, cryopreservation and pollen banks.
17. Explain how natural selection determines the survival of certain variations of adaptations within a population, and how this can lead to evolution.
18. Explain how evidence from fossils supports Darwin's theory.
19. Explain how changes in an ecosystem can lead to endangerment and extinction.
20. Suggest methods of conservation that can be used to ensure the survival of organisms and habitats.

Learning Checkpoints

Learning Checkpoint Title	Attempt 1		Attempt 2 / Extend	
	Mark	RAG	Mark	RAG
Competition and Adaptations				
Feeding Relationships				

Key Vocabulary

Tier 2- Suggest, distinguish, compare, outline, illustrate

Tier 3- Habitat, Community, Ecosystem, Environment, Producer, Consumer



Year 9 Learning Journey

Spring Term

Our World

Core knowledge
1. Describe the processes involved in the carbon cycle
2. Describe what biodiversity is, why it is important, and how human activities affect it
3. Describe the impact of human population growth and increased living standards on resource use and waste production
4. Explain how pollution can occur, and the impacts of pollution
5. Describe how humans reduce the amount of land available for other animals and plants
6. Explain the consequences of peat bog destruction
7. Describe what deforestation is and why it has occurred in tropical areas
8. Explain the consequences of deforestation
9. Describe how the composition of the atmosphere is changing, and the impact of this on global warming
10. Describe some biological consequences of global warming
11. Describe both positive and negative human interactions in an ecosystem and explain their impact on biodiversity
12. Describe programmes that aim to reduce the negative effects of humans on ecosystems and biodiversity

Learning Checkpoints

Learning Checkpoint Title	Attempt 1		Attempt 2 / Extend	
	Mark	RAG	Mark	RAG
Materials Cycling and biodiversity				
Deforestation and Global Warming				

Key Vocabulary

Tier 2- Outline, discuss, compare, review, explore

Tier 3- Carbon cycle, Biodiversity, Pollution, Peat bog, Deforestation, Global Warming, Ecosystem



Year 9 Learning Journey

Summer Term

Cells and Microscopy

Core knowledge
1. Use the terms 'eukaryotic' and 'prokaryotic' to describe types of cells
2. Describe the features of bacterial (prokaryotic) cells
3. Demonstrate an understanding of the scale and size of cells and be able to make order of magnitude calculations, including standard form
4. Recall the structures found in animal and plant (eukaryotic) cells including algal cells
5. Use estimations and explain when they should be used to judge the relative size or area of sub-cellular structures
6. Required practical: use a light microscope to observe, draw and label a selection of plant and animal cells
7. Describe the functions of the structures in animal and plant (eukaryotic) cells
8. Describe what a specialised cell is, including examples for plants and animals
9. Describe what differentiation is, including differences between animals and plants
10. Define the terms magnification and resolution
11. Compare electron and light microscopes in terms of their magnification and resolution
12. Carry out calculations involving magnification using the formula: $\text{magnification} = \frac{\text{size of image}}{\text{size of real object}}$ -including standard form

Learning Checkpoints

Learning Checkpoint Title	Attempt 1		Attempt 2 / Extend	
	Mark	RAG	Mark	RAG
Cell Structure				
Specialised Cells				
Microscopy and Magnification				

Key Vocabulary

Tier 2- Calculate, plan, demonstrate, estimate, judge

Tier 3- Eukaryotic, Prokaryotic, Differentiation, Magnification, Resolution



Year 9 Learning Journey

Summer Term

Cell Division

Core knowledge
1. Describe how genetic information is stored in the nucleus of a cell (including genes & chromosomes)
2. Describe the processes that happen during the cell cycle, including mitosis (including recognise and describe where mitosis occurs)
3. Describe stem cells, including sources of stem cells in plants and animals and their roles
4. Describe the use of stem cells in the production of plant clones and therapeutic cloning
5. Discuss the potential risks, benefits and issues with using stem cells in medical research/treatments (including diabetes and paralysis)

Learning Checkpoints

Learning Checkpoint Title	Attempt 1		Attempt 2 / Extend	
	Mark	RAG	Mark	RAG
DNA and the Cell Cycle				
Cell division and Stem Cells				

Key Vocabulary
Tier 2- Describe, compare, research, discuss, outline
Tier 3- Mitosis, Cell cycle, Stem cells, Clones, Therapeutic cloning