## Scheme of work for Chapter 5, *Ecology and evolution*

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| 5.1              | Communities and ecosystems                 | 4 lessons     | • Review the definitions used in ecology; draw and describe a food chain and extend the concept to a food web of 10 organisms using common species names  
• Define ‘trophic level’ and identify the trophic level of organisms in food chains and webs  
• Explain how energy flows through a food web and that energy transformation is not 100% efficient; explain the shape of an energy pyramid  
• Contrast the flow of energy with the cycling of nutrients and outline the importance of saprotrophic bacteria and fungi in nutrient cycles | p100–105  
Short-answer Qs p102, p105  
End-of-chapter Qs p126–129: Q1, Q5 | Extension: Q1  
Support: Q1 | Practical activity: field work in local habitats  
Link to Chapter 1 and Option G  
Exemplar exam question |
| 5.2              | The greenhouse effect                      | 3 lessons     | • Draw and understand the carbon cycle and how human action affects it; analyse graphs that show the change in atmospheric CO₂ over time  
• Explain the relationships between greenhouse gases, transmission of short- and longer-wave radiation and the temperature of the atmosphere; outline the precautionary principle and why it may be a justification for intervention in respect of the enhanced greenhouse effect  
• Consider the consequences of a rise in global temperatures, in particular in the arctic ecosystems | p105–111  
TOK p109  
Short-answer Qs p111  
End-of-chapter Qs p126–129: Q2, Q8, Q9, Q10 | Extension: Q2, Q4  
Support: Q2 | Link to TOK: precautionary principle  
Link to Aspects of internationalism |
| 5.3              | Populations                                | 1 lesson      | • Outline how population size is affected by birth, death, immigration and emigration and draw a sigmoid growth curve; explain the reasons for the shape of the curve and list three factors that limit population growth | p111–113  
Short-answer Qs p113  
End-of-chapter Qs p126–129: Q7 | Extension: Q5 | Link to ICT: yeast population practical |
| 5.4 | Evolution | 3 lessons | • Define ‘evolution’ and consider the evidence for it from the fossil record, selective breeding and homologous structures  
• Explain the four principles that lead to the theory of evolution by natural selection  
• Explain antibiotic resistance in bacteria and one other example of evolution in response to environmental change | p113–119  
Short-answer Qs p119  
End-of-chapter Qs p126–129: Q6, Q8 | Extension: Q3  
Support: Q3 |
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| 5.5 | Classification | 3 lessons | • Outline the binomial system of nomenclature and list the seven levels in the hierarchy  
• Distinguish between the four main phyla of plants and six phyla of animals using external features  
• Design a key for a group of eight organisms from collected specimens or photographs | p119–125  
Short-answer Qs p123, p124  
End-of-chapter Qs p126–129: Q2, Q3, Q4 | Support: Q4, Q5 |

**Note:** 1 lesson = approximately 40 minutes