



GCSE
ADDITIONAL SCIENCE, BIOLOGY
UNIT B2 – Example 2
4463, 4411

Scheme of Work

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Introduction

This Outline Scheme of Work is one of a number of schemes prepared by practising teachers for the new AQA GCSE Sciences suite. It is hoped that other teachers will find them helpful as the basis for the fully detailed schemes prepared for teaching from September 2006. Each outline scheme covers one unit (B1, B2, B3, C1, C2, C3, P1, P2, P3) and for some units more than one outline scheme is available. This is because there are different, equally valid ways of approaching the teaching of the specifications and a single scheme would not show the range of possible approaches.



The AQA specifications are designed to be used with a wide range of resources, so this scheme does not assume the availability of any particular printed or electronic publications, or any special equipment. Teachers are enabled to use existing resources, including their own, together with resources specially purchased for the new specifications.

The outline scheme is arranged under the section headings of the relevant specification, for example, *11.1.1/12.1 What are animals and plants built from?* The content in the section is further subdivided with a brief statement given of the coverage of each subdivision, together with activities that relate to that content and an indication of the number of hours it is suggested are needed to deliver that part of the content.


Opportunities to deliver 'How Science Works' and to use ICT are highlighted using the same icons as used in the specifications.



-  This identifies parts of the content which lend themselves to extended investigative work of the type needed to explore Sections 10.3–10.7 of the specifications. These sections are about obtaining valid and reliable scientific evidence.
-  This identifies parts of the content which lend themselves to activities which allow Sections 10.2 and 10.8–10.9 to be considered. These sections are about using scientific evidence, for example, how scientific evidence can contribute to decision making and how scientific evidence is limited.
-  This identifies where there are opportunities to use ICT sources and tools in teaching the specifications.



UNIT B2			
Total hours: 2		11.1/12.1 What are animals and plants built from?	
Topic outline		Teaching approach including possible experiments/investigation opportunities	Additional notes
Cell structure		<ul style="list-style-type: none"> • Demonstration model • Label diagrams • Examine fresh material and prepared slides 	<p>You will need a plastic box, polythene bag, jelly, ball and beads.</p> <p>Look at pond water for good examples of unicellular and filamentous algae.</p>
Total hours: 2		11.2/12.2 How do dissolved substances get into and out of cells?	
Topic outline		Teaching approach including possible experiments/investigation opportunities	Additional notes
Diffusion Osmosis	☒	<ul style="list-style-type: none"> • Demonstrate • Demonstrate • Visking tubing, potato chips, carrot disc experiments 	Could discuss fresh and salt water aquaria.






Total hours: 8		11.3/12.3 How do plants obtain the food they need to live and grow?	
Topic outline		Teaching approach including possible experiments/investigation opportunities	Additional notes
Photosynthesis	 	<ul style="list-style-type: none"> • Mindmaps of previous knowledge • Photosynthesis experiments including testing iris for sugar • Datalogging with Elodea and oxygen and pH probes in light and dark to obtain limiting factor data 	Iris leaves freeze well.
Mineral nutrition		<ul style="list-style-type: none"> • Water culture experiment • Deficiency photographs 	Could link to hydroponics at Epcot.



Total hours: 4		11.4/12.4 What happens to energy and biomass at each stage in a food chain?	
Topic outline		Teaching approach including possible experiments/investigation opportunities	Additional notes
Pyramids of numbers and biomass	?	<ul style="list-style-type: none"> Brainstorm previous knowledge Draw examples of pyramids from data Calculations on energy loss Discuss effect on food production 	Shipwreck scenario with hens and grain
Total hours: 3		11.5/12.5 What happens to the waste material produced by plants and animals?	
Topic outline		Teaching approach including possible experiments/investigation opportunities	Additional notes
Decay and carbon cycle		<ul style="list-style-type: none"> Audio-visual Set up wormery School compost heap 	

Total hours: 10		11.6/12.6 What are enzymes and what are some of their functions?	
Topic outline		Teaching approach including possible experiments/investigation opportunities	Additional notes
Enzymes		<ul style="list-style-type: none"> • Demonstrate different enzymes • Discuss characteristics • Circus of home and industrial uses 	
Digestive enzymes		<ul style="list-style-type: none"> • Enzyme practicals including light sensor to datalog effect of amylase, pH effect on protease • Demonstrate bile 	
Respiration, protein synthesis and photosynthesis		<ul style="list-style-type: none"> • Discuss other enzymes in living things • Demonstrate burning sugar • Discuss uses of energy from respiration 	

Total hours: 8		11.7/12.7 How do our bodies keep internal conditions constant?	
Topic outline		Teaching approach including possible experiments/investigation opportunities	Additional notes
Insulin	 	<ul style="list-style-type: none"> • Discuss Banting and Best data • Demonstrate insulin equipment • Audio-visual • Interpret graphs 	www.pbs.org/wgbh/aso/databank/entries/dm22in.html
Sweating		<ul style="list-style-type: none"> • Cooling effect of alcohol • Skin structure and functioning – model, audio-visual 	
Urine production		<ul style="list-style-type: none"> • Practical on balancing sweat and urine • Graphs of data • Audio-visual 	Use measuring cylinders of blue and yellow coloured water.

Total hours: 13		11.8/12.8 Which human characteristics show a simple pattern of inheritance?	
Topic outline		Teaching approach including possible experiments/investigation opportunities	Additional notes
Mendel	 	<ul style="list-style-type: none"> Brainstorm genetic/environmental Research and discuss Mendel and his work 	www.zephyrus.co.uk/gregormendel.html
Monohybrid crosses		<ul style="list-style-type: none"> Construct genetic diagrams (H) Audio-visual 	
Chromosomes, genes, alleles, DNA		<ul style="list-style-type: none"> Photos of chromosomes Demonstration with bead strings/plasticine DNA model 	

Topic outline		Teaching approach including possible experiments/investigation opportunities	Additional notes
Cell division		<ul style="list-style-type: none"> • Audio-visual • Demonstration with bead strings 	
Stem cells	 	<ul style="list-style-type: none"> • Research • Discussion • Tabulating results • Treatment of paralysis - could look at paralympic athletes 	http://gslc.genetics.utah.edu/units/stemcells (interactive) http://news.bbc.co.uk/1/hi/health/2996988.stm www.miamiproject.miami.edu
Cloning	 	<ul style="list-style-type: none"> • Geranium cuttings • Dolly the Sheep • Identical twin studies • Genetic fingerprinting 	
Sex inheritance		<ul style="list-style-type: none"> • Chromosome photographs • Mechanism diagram • Abnormal combinations 	http://anthro.palomar.edu/abnormal

Topic outline		Teaching approach including possible experiments/investigation opportunities	Additional notes
Inherited disorders		<ul style="list-style-type: none"> • Huntington's disease symptoms • Genetic diagrams (H) • Cystic fibrosis – could get a local speaker • Symptoms, genetic diagrams (H), audio-visual including gene therapy 	www.ninds.nih.gov/disorders/huntington
Genetic screening		<ul style="list-style-type: none"> • Discussion • Tabulate results 	