GCSE
BIOLOGY – UNIT B3
Example 2
4411

Scheme of Work

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 How do human bodies respond to changes inside them and to their environment?* 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 BIOLOGY 3			
Total hours: 13	**13.1 How do dissolved materials get into and out of animals and plants?**		
Topic outline		**Teaching approach including possible experiments/investigation opportunities**	**Additional notes**
Diffusion, osmosis, active transport		• Revise diffusion and osmosis • Introduce active transport • Demonstration with beads and net	
Lungs and breathing		• Audio-visual • Eroded lung • Label diagram • Bell jar model, skeleton	www.aduk.org.uk/lungs_diagram.php www.vilenski.org/science/humanbody
Alveoli and villi		• Their specialisation for exchange	www.northhullclc.com – Deep Cells link (interactive)
Plant exchange structures		• Use plant anatomy slides, nail varnish preparations of stomata and epidermal strips of leaves	

Topic outline		Teaching approach including possible experiments/investigation opportunities	Additional notes
Transpiration	 	• Bell jar demonstration • Potometers/weighed shoots to investigate affecting factors • Vaseline experiment	GCSE Bitesize

Total hours: 7	13.2 How are dissolved materials transported around the body?		
Topic outline		**Teaching approach including possible experiments/investigation opportunities**	**Additional notes**
Heart		• See model heart • Dissect heart • Heart photographs • Labelled diagram	www.lessontutor.com – introduction to the circulatory system www.northhullclc.com – Deep Cells link
Double circulation		• Colour diagram • Diagrams of arteries and veins • Demonstrate pocket valves • Make red and blue plasticine model • Audio-visual	www.northhullclc.com – Deep Cells link
Blood		• See prepared slides • Tabulate blood structure and functions	www.northhullclc.com – Deep Cells link

Total hours: 7	13.3 How does exercise affect the exchanges taking place within the body?		
Topic outline		**Teaching approach including possible experiments/investigation opportunities**	**Additional notes**
Exercise		• Collect data on pulse and breathing rates before and after exercise • Discuss results and implications • Discuss sprint and marathon preparation and performances of athletes	

Total hours: 7	13.4 How do exchanges in the kidney help us to maintain the internal environment in mammals and how has biology helped us to treat kidney disease?		
Topic outline		**Teaching approach including possible experiments/investigation opportunities**	**Additional notes**
Kidney		• Revise kidney relating to homeostasis • Audio-visual • Dissect kidney • Functioning of kidney	
Transplants and dialysis		• Examine donor cards, discuss, design poster/donor card • Research dialysis methods • Role play and discussion leading to tabulating advantages and disadvantages of donors and dialysis	

Total hours: 8	13.5 How are microorganisms used to make food and drink?		
Topic outline		**Teaching approach including possible experiments/investigation opportunities**	**Additional notes**
Microorganisms	 	• Investigate and discuss work of Spallanzani, Schwann and Pasteur	www.daviddarling.info/encyclopedia/S/Spallanzani.html http://scienceworld.wolfram.com/biography/Schwann.html
Use in foods and drinks		• Circus of products	
Yeast	 	• Make slides to see yeast structure • Yeast fermentation experiments • Investigate beer and wine production and make flow charts • Ferment fruit juice	
Bacteria		• Examine yoghurt cartons • Make yoghurt	

Total hours: 7	13.6 What other useful substances can we make using microorangisms?		
Topic outline		**Teaching approach including possible experiments/investigation opportunities**	**Additional notes**
Biofuels		• Set up biogas generator • Research, evaluate and tabulate generator designs and raw materials	
Fermenters		• Research industrial fermenters and produce annotated diagrams	
Mycoproteins		• Investigate food labels to find examples of mycoproteins • Discuss vegetarian diets	
Total hours: 7	**13.7 How can we be sure we are using microorganisms safely?**		
Topic outline		**Teaching approach including possible experiments/investigation opportunities**	**Additional notes**
Growing microorgansms		• Culture purchased bacteria on agar plates using inoculating loops • Research work of hospital pathology labs	