



GCSE

Biology





GCSE

Biology

GCSE
Biology

Introduction

Welcome to your GCSE Biology course. This introduction will serve as a guide to what you can expect from the course, and it will show you how to plan your study of this course effectively. Take your time to read this Introduction thoroughly before you start the lessons.

The course is designed to prepare students for the **AQA GCSE Biology specification (syllabus)**.

The AQA subject code is **4411 GCSE Biology**

Please note that this course has five examined components:

- Examination paper Biology 1
- Examination paper Biology 2
- Examination paper Biology 3
- An item of practical coursework
- An examination paper based on the practical work

The practical work should be possible to do without access to a laboratory, but if you do have the opportunity to perform supervised laboratory work in the course of your studies this will add to them greatly.



The Course

The course is different from GCSE Biology courses of the past in that it attempts to look at the way biology affects your everyday life and how you can evaluate the scientific material that you come across in newspapers, magazines and on the television. The course is an ideal preparation for those who wish to go on to study biology at AS and A2 level.

If you have some background in biology then you will find some of the lessons will touch upon things that you have met before, but the course is designed to be fully understandable with those who have little or no previous background in science.

Arrangement of Lessons

The lessons are planned so that material for the four examination papers are covered by the four modules of the course;

Biology 1
Biology 2
Biology 3
Science Skills

You should note that the fourth module is common to examinations for GCSE Chemistry and GCSE Physics. If you are doing more than one of these courses with Oxford Open Learning then you will find that this material is common to all three courses but TMA J based on this material is different so you will need to send separate TMAs to each of your tutors for science subjects.

You should do the three main biology modules in order but the Science Skills module can be completed whenever you like but this must be before you start on your practical assessment (see below).

Textbook

The textbook that is referred to throughout this course is

AQA GCSE Biology
Anne Fullick – Nelson Thornes - ISBN 0-7487-9641-X

You will need a copy of *AQA GCSE Biology* throughout the course; you can buy a copy through the Oxford Open

Learning website. It is referred to in almost every lesson and provides excellent coverage of the material. By using the textbook and the course you will have very full coverage of all the material.

You should not need other books throughout the course but you may like to look in other science books from time to time. If you feel that you would like to use a revision guide before the examination you should ask your tutor which one they recommend.

Lesson Contents and Textbook References

Biology Module 1		
<i>Lesson</i>	<i>Title</i>	<i>Book Reference</i>
1	Responding to change	B1.1
2	Keeping Healthy	B1.2
3	Uses and Abuses of Drugs / TMA A	B1.3
4	Cause and Prevention of Disease	B1.4
5	Survival in the Environment/ TMA B	B.1.5
6	Genes and Genetics	B.1.6
7	Darwin and Evolution / TMA C	B1.7
8	Humans and the Environment	B1.8

Biology Module 2		
<i>Lesson</i>	<i>Title</i>	<i>Book Reference</i>
9	Cells	B2.1
10	Movement of Substances / TMA D	B2.1
11	Green Plants	B2.2
12	Energy and Food Chains / TMA E	B2.3

13	Enzymes	B2.4
14	Homeostasis	B2.5
15	Inheritance / TMA F	B2.6

Biology Module 3

<i>Lesson</i>	<i>Title</i>	<i>Book Reference</i>
16	Respiration	B3.1
17	Transportation	B3.2
18	Movement / TMA G	B3.2
19	The Kidney	B3.2
20	Micro-organisms (1)	B3.3
21	Micro-organisms (2) / TMA H	B3.3

Science Skills

<i>Lesson</i>	<i>Title</i>	<i>Book Reference</i>
22	What is Science All About?	H1
23	Can we Believe Scientists? / TMA I	H8 and H9
24	Investigating and Observing	H3 and H4
25	Gathering Data	H H6 and H7
26	Coursework / TMA J	-
Appendix	Biology Fieldwork	-

Internet Resources

In each lesson of the course, internet sites are given which have been carefully selected to illustrate points in the course and to provide additional activities. These are an important tool in your understanding of your biology course and you should make every effort to view them and use the activities that they contain. If you do not have an internet connection

at home, consider building in regular trips to a library or internet café as part of your study schedule.

The Structure within each Lesson: how to study

Front Page

The front page of each lesson shows:


- The title.
- **Aim(s)** for the lesson. These set out the position that you should reach after working through the lesson; keep these in mind while reading the lesson material.
- **Context.** This gives a very brief summary and shows how the lesson fits in with the rest of the course.
- **Reading.** The individual references for each lesson.

Lesson Notes

There then follow the notes; these are an outline of the subject material to be studied in the lesson. Read the notes carefully several times until you feel that you have understood the broad outline of the theory involved, and then tackle the reading references. The textbook may deal with the subjects in greater detail, and, as with the notes, you will probably need to read the passages several times.

Activities

Most activities in the course are placed in the notes at the relevant point. Activities are indicated as follows:

Activity 7	Investigate how a nucleus is held together, particularly how the binding energy of the nucleus relates to Einstein's equation, $E = mc^2$.
	

The pencil symbol indicates that you should make your own notes in the space provided.

Self-Assessment Tests

When you feel that you have mastered the topics and completed the activities, tackle the practice tests, which are at the end of every lesson that does not contain a tutor-marked assessment.

Tutor-marked Assignments

After every three or four lessons there is a tutor-marked assignment. These are in GCSE examination style and should be carried out under timed conditions to give you examination practice. These tests will thoroughly check your understanding of the previous few topics. You should send your answers to these tests to your tutor, who will return your marked script, together with a set of suggested answers.

Revision

Do **not** leave all your revision until the end of the course. You will need to revise thoroughly for your examination, but frequent revision throughout the course is **essential**. Plan your revision sensibly, and re-read as you feel necessary, if your knowledge is beginning to fade.

Coursework

You will need to discuss the coursework with your tutor once you have made a start on the course. AQA will specify the topic that you will be working on. Do not start the coursework before discussing it with your tutor.

You should not need too much in the way of specialist equipment for your coursework – mainly items that you can find in the kitchen. If the coursework involves you in some biology fieldwork an appendix to the course gives you plenty of advice on how to go about this.

Checking the Syllabus

As you know, this course has been written to cover the contents of the **AQA syllabus 4411** which is available to download (you will need an Adobe Acrobat reader on your computer) at:

www.aqa.org.uk

You should read the syllabus throughout the course, so either keep a copy on your computer or print it out. If you do not have access to the internet, the syllabus is available from:

AQA Logistics Centre (Manchester)
Unit 2, Wheel Forge Way,
Ashburton Park, Trafford Park,
Manchester
M17 1EH

Past Papers

AQA now makes all (but the very last set) of past papers available online for free download at:

www.aqa.org.uk

Discuss with your tutor how to approach these.

Your Tutor

You have a lot of resources to help you in your studies; your course file, textbook, internet resources and your tutor. You should make good use of your tutor to help you with any difficulties that you may have during the course.

And finally... very good luck with your studies.

Copyright © Oxford Open Learning 2006

**Biology
GCSE
ISA**

Your Coursework Practical

Introduction

Your coursework instructions are included in the following pages. Please read them carefully and talk to your tutor about which one you intend to do.

Each practical is called an 'ISA' (investigative skills assessment) and you will need to follow it up with a written paper at your examination centre. You need to choose at least one of the following practicals. You can choose to do more than one, but this will mean that you will take more than one written test. If you do take more than one test, the best mark will be used in assigning your final grade. It is important to discuss this with the examinations officer at your centre as soon as you can.

You should write up the chosen experiment as fully as possible using the lessons on practical work (in particular Lessons 24, 25 and 26) to help you. You are able to take a copy of your experimental write-up and data into the examination with you.



Oxford Open Learning

Biology 1 ISA — Reaction Times

Risk Assessment

This experiment has no particular risks involved but;

- When dropping sticks care should be taken that toes are protected.
- Keep young children out of the way while doing this experiment.
- Take care of your eyes and of the eyes of your partner when performing this experiment.
- This experiment is best performed on a carpeted area or out of doors



Students with Disabilities

If you have a disability which will prevent you from doing this experiment you will need to discuss this with your tutor.

Background

When an event occurs, the brain takes a certain time to react to it. For example, when driving along a road, a driver can take roughly two thirds of a second to react to the car in front beginning to brake. This time is called the *reaction time*. How far would a car travelling at, for example, 50 mph go in this two thirds of a second?

It is important for drivers to allow for the time they take to react when driving, and to be aware of the fact that they may have a reaction time that is slower than average. A simple experiment to measure reaction times can be carried out using a metre ruler. A friend holds the metre ruler vertically and drops it, while you try to catch it as soon as possible after it is released.

Part One: The Practical Work

You will need a helper for this experiment.

Method



1. Place a mark on a smooth, even stick of light wood close to one end.
2. Sit with your forearm on a table surface so that your hand extends over the edge.
3. Have your partner hold the stick with the mark between, but not touching, your thumb and fingers.
4. Ask your partner to release the stick without warning.
5. Catch the stick as quickly as you can between your thumb and fingers.
6. Mark where you caught the stick.
7. Measure the distance between the original mark and point where the stick was caught as accurately as you can.
8. Repeat the experiment a number of times.
9. Change places with your partner and repeat the experiment

Part Two: the Data Processing

You should draw up a table of results and process the data in an appropriate way, e.g. charts, graphs, diagrams or line of best fit.

Equipment

Get a piece of lightweight, sanded wood of about one metre in length from your local DIY supplier. You will also need an accurate tape measure or steel rule that measures in millimetres.

Remember:

You must decide:

1. How you will make this a fair test.
2. How many repeats you should carry out.

Before you start the practical work you must draw up a table ready to record your results.

When you have finished your investigation:

1. Make sure that you have produced a clear table of results.
2. Process your results to produce what you think is the most appropriate **graph** or **chart**.

Biology 1 ISA — Fieldwork Investigation

Risk Assessment

This is a low risk activity but you should be aware of the following:

- Take care if you are working near water.
- Take into account any allergies that you have and how these will be affected by working in your chosen environment.
- Fieldwork can bring you close to stinging plants and insects.
- Always let someone know where you are working.
- Keep a close eye on young children if they accompany you.

In addition to the normal risk assessment, please read the fieldwork code of conduct which is reproduced in the **Appendix: Fieldwork**.

Many areas, including certain parks and forestry commission land require written permission to conduct fieldwork within them. You will need to apply for this in advance.



Students with Disabilities

If you have a disability which will prevent you from doing this experiment you will need to discuss this with your tutor.

Background

You will find the material in Lesson Five and the **Appendix: Fieldwork** important when planning this practical.

Part One: The Practical Work

You should carry out a fieldwork investigation related to the distribution of a particular species. You may investigate any factor that may have an influence on the distribution. The method should involve the use of a **quadrat** to sample a **transect**.

Thought will need to be given to:

- the number of measurements to be taken within each sample.
- the number and location of samples to be taken.

It is important that, whatever the plan is, you must be involved in taking some measurements.

Part Two: The Data Processing

You should draw up a table of results and process the data in an appropriate way, e.g. charts, graphs, diagrams or line of best fit.

Equipment

You should find that the wood necessary to build a quadrat is readily available from your local DIY store. A metric tape measure will be necessary for the transect. If you decide to use other equipment – light meters, thermometers, etc, you should build your plan around the equipment readily available to you.

Inexpensive digital read-out thermometers are available from:

www.toolstation.com/search.html?searchstr=thermometer

Remember:

You must decide:

1. How you will make this a fair test.
2. The species that you chose to investigate.
3. How many repeats you should carry out.

Before you start the practical work you must draw up a table, ready to record your results.

When you have finished your investigation:

1. Make sure that you have produced a clear table of results.
2. Process your results to produce what you think is the most appropriate **graph** or **chart**.