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MAKING USE OF BIOLOGY

Pauline Alderson
and
Martin Rowland

Second Edition

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INTRODUCTION FOR TEACHERS

This book emphasises ‘social, economic, technological, ethical and cultural influences [on] and limitations [of]’ the study and practice of Biology, as specified by the National Curriculum. It also covers the University of London Examinations and Assessment Council’s 1995 Science: Biology B (1028) Syllabus. The Syllabus is available for any age; many schools have adopted it as a mainstream course because of its intrinsic interest. The reason there is no separate Human Biology Syllabus is that it could differ only slightly from the one covered in this book.

At least a week can be allowed for each Unit if the course is taught in a year, two weeks if it is taught in two years. Unit 6 on ‘Fermentation’ and Unit 25 on ‘Genetics, Cell Division, DNA and Genetic Engineering’ may need twice as long as most Units.

Part 1 deals with ‘Economic and Environmental Biology’, Part 2 with ‘Human and Social Biology’. Either Part can be taught first. Students who have done no Biology before might find it easier to begin with Part 2, where the early Units cover some basic subject-matter and have experiments that are easier than most. Students coming to this Syllabus with a basic Biology background in Science might find the early Units in Part 1, where the subject-matter is unfamiliar and up to date, more interesting.

No attempt has been made to put an equal amount of practical work at the end of each Unit. The Experiments come at the ends of the Units to which they are relevant. Whereas Unit 8 has five Experiments, a number of Units have none. They may be undertaken in any order except where a ‘Note to teachers’ says otherwise.

You should read not only Appendix D on ‘Practical Work’ but also the guidance on scientific investigations given to students in Appendix B, as well, of course, as the Syllabus.

At the end of each Unit there are at least three questions of varying difficulty. Because students cannot have too much practice in answering suitable questions, it is desirable to supplement those in this book with past examination papers or specialist books of questions.

This book uses the Institute of Biology’s recommendations on biological nomenclature, units and symbols for secondary education. It uses billion to mean a thousand million (1 000 000 000). For the sake of clarity it hyphenates compound adjectives including chemical compounds when they are used as compound adjectives.

Nothing in this book requires students or teachers to kill animals. Animals brought into the classroom for study should be returned unharmed to their habitats.

INTRODUCTION FOR STUDENTS

This book tells you how yoghurt, beer and wine are made. It tells you about biological washing powders, contraception, test-tube babies, heart attacks, AIDS, drugs and new forms of food. It describes how criminals can be identified from a piece of skin, a hair root, a drop of blood or (in rape cases) a drop of semen; how smoking and drinking affect health; how we can find out if our children will be born with handicaps or disorders; how tiny organisms can be used to make things for us; how ladybirds can be used to eat the pests on crops, with the result that the pests need not be killed by chemicals that end up in our food.

It is unlike most biology textbooks because it is largely about humans and real life. Remember that what goes on in real life changes all the time. Cut out any stories you see in newspapers about new food or new methods of food production, new drugs, new methods of contraception, new dangers from pollution, advances in genetic engineering or anything else that involves something biological.

All the Units in this book have at least three questions at the end: the pages on which there are questions are flagged, which makes it easy to find them. The questions are all of the kind you will get in your GCSE examination. At the end of each Unit, the easy questions usually come first and the difficult ones last. There are answers at the end of the book but you will get greater benefit if you do not look at them until you have decided on your own answers.

There is practical work at the end of many of the Units. The practical work includes experiments from ULEAC's 1995 Science: Biology B Syllabus. Passages that affect safety are included in shaded boxes.

Appendix A tells you the bits of mathematics, physics and chemistry you need to know. Appendix C tells you how to draw and compare biological specimens, how to answer examination questions and how to revise.