

Subject: GCSE Additional Science (EDEXCEL)

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Year 11 - Academic Year 2010-2011

Contents: what you will study

During Year 11 you will study 12 topics, 4 in Biology, 4 in Chemistry and 4 in Physics. All the Biology topics will be examined together, all the Chemistry topics will be examined together and all the Physics topics will be examined together. The examinations will be external and take place in March and June. The topics will rotate throughout the year and you will find that your topics will not match those done by other sets at the same time. It will not be possible to inform you here which topics you will cover in a specific term but a full list of the Year 11 topics is supplied and once your teacher informs you which topic you are studying you will be able to use this booklet to locate what you need to learn.

In Year 11 You will study two from the following areas each term:

Biology topics

Inside living cells (B2.1) looks more closely at the processes taking place inside cells, such as how are proteins made from DNA. Biotechnology is introduced and the importance it has in food production.

Divide and develop (B2.2) extends the idea of cell division, looking at mitosis and meiosis in detail. The use of stem cells and ethical issues raised in the use of stem cells is explored.

Energy flow (B2.3) introduces the higher ideas about energy flow in the environment. The impact the population is having on the environment in terms of the need for more efficient food production.

Interdependence. (B2.4) looks at the interdependence of living organisms in the environment. The importance for adaptation to a changing world. The effect human activities are having on the environment.

Chemistry topics

Synthesis (C2.5) introduces the higher ideas about organic chemistry, originally introduced as part of fossil fuels in unit C.1b.7, plus chemical calculations & mole theory

In your element (C2.6) looks deeper into molecules and bonding – just how do atoms stick together as molecules and what are ionic bonds (a metal & a non-metal), plus more on the periodic table and reactions of the groups of elements.

Chemical structures (C2.7) extends the ideas of bonding to look at covalent bonds (two non-metals), still more on organic (carbon) chemistry, metallic bonding and using chemicals as drugs.

How fast? How furious? (C2.8) how do you measure the speed of a chemical reaction, what makes it faster or slower, some reactions end up in a balance without going all the way to the right hand side (equilibrium), how we use these ideas in industry.

Physics topics

As fast as you can! (P2.9) extends the ideas of forces already studied. Velocity and acceleration calculations are introduced. The factors effecting thinking, braking and stopping distances are looked at.

Roller coasters and relativity (P2.10) looks deeper at the concept of energy. Einstein and relativity are discussed along side the principles behind roller coasters.

Putting radiation to use (P2.11) explores the use of X-rays and gamma rays in everyday use, the concept of half-life and looks at the life of Marie Curie.

Power of the atom (P2.12) investigates the principles behind chain reactions and how they are controlled. The safety issue of using nuclear power stations is raised. How we get electric shocks is unearthed and the dangers and uses of electrostatics is looked at.

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National Curriculum levels at which you will work

A copy of the EDEXCEL specification can be found on the internet at:

<http://www.edexcel.org.uk/quals/gcse/science/gcse-sci2006/gcse-sci/> .

Here you will find the Specification as a .pdf file. This includes the relevant National Curriculum programme of study. The relevant aspects of the course which are for Higher students only are indicated in the textbook / Active Book. If you cannot access this site at home or in school please ask your teacher for help.

Skills which you will develop this year:

Use of microscopes. Comparing images of types of cells. Performing reactions involving enzymes.

Comparing reactions and properties of elements and compounds. Using the periodic table to predict properties and reactions of elements. Investigating the preparation of metal salts.

Planning, carrying out, analysing, and evaluating experimental work. Assessing the risks involved. Comparing elements in the periodic table. Using word and symbol equations to represent chemical reactions. Measuring reactions and compounds.

Modelling and drawing out the structure of chemical compounds. Working with and balancing symbol equations.

Critically evaluating electrical appliances and calculating the cost of using these appliances. Comparing the cost of producing electricity, in environmental terms, with the benefits.

Drawing and making electrical circuits. How to use electricity safely. Calculations involving Current, Potential Difference (Voltage), Charge, using graphs to represent current and voltage in different components and power.

Assessment: how you will be tested this term

This is a one year course, leading to a single grade for GCSE Science.

Practical work will be assessed throughout the course by you teachers and is worth 10% of the GCSE.

In addition there will be three internally assessed tasks where you will be tested on you ability to manipulate and explain data (one for biology, one for Chemistry and one for Physics). Together these make up 30% of your GCSE.

End of module test (internal – during lessons)

External examinations - Multiple choice and short structured questions in June.

Homework and practice modular exams.

Equipment which you will need for this terms work

Classroom materials – pen, pencil, ruler, **calculator**, protractor, pie chart circle etc.

You will be supplied with a CD-Rom of the Active Book, take this home and arrange for a copy the disk to be made. You must than return the Active Book disk to your teacher. Text books can be supplied to those who do not have access to a PC at home.

Key words which you will need to learn for this term's work

Key words are explained in the glossary at the back of each chapter in the textbook / Active Book.