

**Subject: Triple Science (EDEXCEL Additional Science & Extension Materials)**

Department Staff - Miss C Callaghan,  
Mrs M Anthony, Mrs C Bahl, Ms P Burns, Miss B Desir,  
Mr B Joshua, Mr A Kutten, Miss A Patel

Year 11 - Academic Year 2009-2010

***Structure of the course:***

After completing units the first two Biology, Chemistry and Physics units of the EDEXCEL Additional Science course in the Summer Term you will immediately begin working towards the last two units of the Biology, the Chemistry and the Physics topics. So you will aim to complete the Additional Science course and examined on all these units in November.

The EDEXCEL Additional Science course will be completed during the winter term. You will immediately begin working towards the Extension materials during the Spring and Summer terms and be assessed by external examination in the summer of 2008. The Biology aspects of the 360 Science course, the Additional Science course and the Extension materials will together combine to give you a grade in Biology at GCSE. The Chemistry aspects of the 360 Science course, the Additional Science course and the Extension materials will together combine to give you a grade in Chemistry at GCSE. The Physics aspects of the 360 Science course, the Additional Science course and the Extension materials will together combine to give you a grade in Physics at GCSE. The Extension materials will also provide a firm foundation for the study of the Sciences at A level.

***National Curriculum levels at which you will work this year***

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:***

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.

***Equipment which you will need for this year's 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 then 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 year's work***

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

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Year 11 - Autumn Term 2009

***Contents: what you will study***

***Biology topics:***

***Additional Science Units 2.3 Energy flow & 2.4 Interdependence.***

These units look at the impact that our growing population has on the environment. The need for more efficient food production and the impact our activities having on the environment. The need for organisms to continually adapt to the changing environment and the interdependence of organisms on the living environment.

***Chemistry topics:***

***Additional Science Units 2.7 Chemical structures & 2.8 How fast? How furious?***

Units 2.5 & 2.6 looked at making new chemicals and the nature of the chemical bond in ionic compounds. Unit 2.7 takes this further to look at other types of chemical bonds: covalent and metallic bonding. How to represent compounds and reactions using symbols, formulae and equations. Unit 2.8 teaches us how to measure the speed of reactions and how to control them and how these ideas are used in industry to make useful materials

***Physics topic:***

***Additional Science Units 2.11 Putting radiation to use & 2.12 Power of the atom.***

These units explore the use of X-rays and gamma rays in everyday use, the concept of half-life and looks at the life of Marie Curie. The Power of the atom 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.

***Assessment: how you will be tested this term***

**All of the work from units 2.1 to 2.12 in Additional Science will be examined externally in the Winter or Spring terms. These examinations will count as 60% of the Additional Science aspect of the GCSE grade.**

A minimum of 40 % of the Additional Science aspect of the GCSE will come from practical assessments and internal assignments.

End of module test (internal – during lessons).

Homework and practice modular exams.

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Year 11 - Spring and Summer Terms 2010

***Contents: what you will study***

***Extension materials for Biology:***

**B3.1 Biotechnology**

Biotechnology is one of the fastest growing new industries in the developed world. The biotechnology industry will need highly-skilled people to work in it. This unit gives students the opportunity to study the contribution of biotechnology in the production of food and drink, and how this could impact on world food shortages, the treatment of disease and development of new medicines. As with all new developments, advances in biotechnology raises new ethical questions which will be considered in this topic.

**B3.2 Behaviour in Humans and Other Animals**

Behaviour is an essential part of any animal's strategy for survival. This unit gives students an insight into instinctive and learned behaviour and how humans may make use of conditioning when training animals. Understanding why people behave as they do helps us to make rules and laws that work. The topic compares feeding behaviour in herbivores and carnivores and considers parental care as part of reproductive behaviour. It explores the ethical issues surrounding the use of animals by humans.

***Extension materials for Chemistry:***

**C3.3 Chemical detection**

Building on the ideas at the start of the 360 course you will learn how to identify unknown chemicals using a variety of methods and by their typical reactions. You will extend your understanding of the methods used in chemical mass and concentration calculations and how to apply these methods to reactions you will carry out in the laboratory including titrations and solution chemistry.

**C3.4 Chemistry Working for Us Concept**

A chance to look closer at the chemistry of transition metals and organic chemicals such as alcohols and carboxylic acids. Other topics include: the chemistry behind the action of soaps and detergents, what is reduction and oxidation, a look at electrolysis and its uses and the uses of several common chemicals and how they are made industrially e.g. sulphuric acid.

***Extension materials for Physics:***

**P3.5 Particle in Action**

Particles range in size from quarks in nucleons to molecules in gases and other forms of matter. An understanding of the behaviour of these particles can help scientists explain phenomena ranging from sub-nuclear scale to the macroscopic scale. Our knowledge of particles has led to the development of applications such as televisions and X-rays equipment.

This topic may be used to show that scientific ideas, such as particle models, change over time and that today there are some questions that scientists cannot answer at the moment such as- 'is a quark made from smaller particle?'

**P3.6 Medical Physics**

This unit enables students to study how applications of physics in medical science can be used for non-invasive investigations of medical conditions, including the use of endoscopes and positron emission tomography (PET). There are opportunities for students to use ICT equipment to collect and analyse data using electrocardiogram (ECG) watches connected to a computer. The use of radiation treatments by hospital physicists to destroy some types of malignant growths is also studied.

***Assessment: how you will be tested this term***

Structured question examination for one hour to be taken in June for each extension unit, B3, C3 and P3.

End of module tests (internal – during lessons)

Homework and practice exams.