

Subject: Triple Science (EDEXCEL 360 & Additional Science)

Department Staff – Mr B Joshua, Mrs M Anthony, Mrs C Bahl,
Ms P Burns, Miss B Desir, Mr A Hope, Mr A Kутten,
Miss C O'Brien, Miss A Patel

Year 10 - Autumn Term 2010

Contents: what you will study

During Year 10 you will study all the 12 topics, 4 in Biology, 4 in Chemistry and 4 in Physics, which students in the GCSE Science course (360 Science) cover. However, you will complete the course by the end of the Spring term. You will then start on the Additional Science Course in the Summer term. The content of Additional Science will be detailed in the Summer Term booklet.

In the Autumn term you will take the following units and be examined on them in November:

Biology topics:

Environment (B1a.1) & Genes (B1a.2) – examined together

(B1a.1) is a look at the inter-relationships between animals in habitats, food chains and webs, and the flow of energy through them, variation, evolution and competition. Find out how all life depends on all other living things and ultimately on the sun.

(B1a.2) covers cell division and reproduction, inheritance and genetics and control of reproduction. Do you know how unique you really are - there is not and has never been anyone exactly like you – find out why.

Chemistry topics

Patterns and properties (C1a.5) & Making changes (C1a.6) – examined together

(C1a.5) examines the development and use of the Periodic Table and reactions and trends of elements in groups in the table. This one object is probably the most useful tool a chemist can have.

(C1a.6) looks at types of reactions: oxidation, reduction, displacement, exothermic and endothermic. It also looks at how we use chemicals and chemical reactions everyday.

Physics topics

Now you see it, now you don't (P1a.11) & Space and its mysteries (P1a.12) – examined together

(P1a.11) What is light? How do mobile phones work? This topic looks at light as an electromagnetic wave and the other types of electromagnetic radiation we use.

(P1a.12) as the title suggests, this is about the universe. Suns, stars, planets, satellites, comets. How do we look at objects in space and how could we get to them.

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.

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Skills which you will develop this term:

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.

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

By the end of the year you will have completed the GCSE Science course which leads to a single GCSE grade.

Modular Exams – External: this counts as 30% of your final GCSE Grade in Year 10. (There are three 20 minute Modular exams in November based on the three units detailed in “Contents”)

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

In addition there will be between three or more internally assessed tasks where you will be tested on your knowledge of the topics and your ability to explain data.

Together these make up 30% of your GCSE.

End of module test (internal – during lessons)

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 of the textbook / Active Book.

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Year 10 - Spring Term 2011

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In the Spring term you will take the following units and be examined on them in March:

Biology topics:

Electrical and chemical signals (B1b.3) & Use misuse and abuse (B1b.4) – examined together

(B1a.3) How do we make our bodies do things? This looks at the nervous system and how nerve impulses are carried by neurones. It also looks at how chemical signals (hormones) are produced and used in the body.

(B1a.4) covers micro-organisms and disease, how our bodies defend themselves and how different drugs can have positive and negative effects on the body.

Chemistry topics

There's only one earth (C1b.7) & Designer products (C1b.8) - examined together

(C1a.7) covers how we get energy from reactions, use of fuels and the effect on the environment, the chemistry of petroleum and how we use reactions to obtain the chemicals we need.

(C1a.8) takes us through the way we obtain the materials we need, smart materials which change back to their original shape when heated, nano-technology where we could build computers and machines too small to ever see and how we make materials to do a specific job.

Physics topics

Producing and measuring electricity (P1a.9) & You're in charge (P1a.10) – examined together

(P1a.9) an integral part of science is how we make and use electricity. Here we look at current, voltage and resistance – the basic concepts that make all electrical appliances work.

(P1a.10) making electricity for the nation: how we make and transfer electricity, how we avoid wasting electrical energy in appliances and other ways of making electricity without burning fossil fuels.

National Curriculum levels at which you will work

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End of module test (internal – during lessons)

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Year 10 - Summer Term 2011

Contents: what you will study

After completing all of the assessments for the EXEXCEL 360 Core Science course in the Spring Term you will immediately begin working towards the Additional Science GCSE, and aim to complete this by the end of the Winter term in Year 11.

In the Summer term you will cover the following topics:

Biology topics: Inside living cells(B2.1) and Divide and develop (B2.2) – to be examined in November 2009

Inside living cells looks more closely at the processes that take place in cells, how proteins are actually made from DNA, what happens in respiration, why is anaerobic respiration just as important to us as aerobic respiration and can we really believe all we read about diets?

Divide and develop reveals the importance of stem cells to us and raises ethical questions about our use of science in society. The methods used in cloning and artificial selection are looked at in depth. Plant growth and their hormones are looked at and their use in food production.

Have you ever wondered?

Will scientists be able to make me a personalised medicine?

Who owns the medicine if the original plants come from a different country?

Should you be allowed to choose the sex of your baby?

Is genetically modified food safe to eat?

Chemistry topics: Synthesis (C2.5) and In your element (C2.6) – to be examined in November 2009

Synthesis and In your element build on the basics covered in Year 10 and introduces the uses of chemistry in society. When an unknown substance is found the first step is to discover what the substance contains. The reactions of ions in solution provide extensive opportunity for practical work. Specific ions have characteristic reactions and that these reactions can be used to identify them.

The final challenge in this area, to identify an unknown ionic compound, can give students satisfaction and proof of their newfound abilities! Students can be introduced to ionic equations as an extension of their practical work. These equations show only the ions which react to give, or are produced from, non-ionic products and precipitates. Calculations will help students to understand that amounts of substances can be measured in moles of particles as well as in grams or as a number of particles. The idea that one mole of molecules of any gas occupies the same volume under the same conditions of temperature and pressure enables students to do calculations involving the production of gases from solid and liquid reactants.

An understanding of Avogadro's law enables students to do calculations for reactions involving solely gaseous reactants and products. Students can investigate applications of qualitative and quantitative analysis in fields such as forensic science, quality control and research. The topic will also help students to appreciate the need for accuracy and reliability of data.

Have you ever wondered?

How does a forensic scientist work?

Why do we need to analyse substances?

Why is it important to know that the label of contents on the packet is correct?

How pure is our water and how pure does it need to be?

Physics topic: As fast as you can! (P2.9) and Roller coasters and relativity (P2.10) - to be examined in November 2009.

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 the sub-nuclear scale to the macroscopic scale. Our knowledge of particles has led to the development of applications such as televisions and X-ray 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 particles?'

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Have you ever wondered?

Would our bodies explode if we went into space without a space suit?

Is there anything smaller than protons, neutrons and electrons?

Is anti-matter real, or just science fiction?

How does a TV work?

National Curriculum levels at which you will work

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Assessment: how you will be tested this term

All of the work studied in this term will be externally assessed in year 11 and will count towards your qualifications in GCSE additional Science or GCSE Biology, Chemistry and Physics.

A minimum of 40 % of the marks will come from practical assessments and internal assignments. External Examinations in the Winter term of 2007 will be worth 60% of the GCSE. During the Additional Science course the external examinations will be based on both multiple choice and short answer questions.

End of module test (internal – during lessons)

Homework and practice modular exams.

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