

SUMMER PREPARATORY WORK

APPLIED SCIENCE, MEDICAL & FORENSIC SCIENCE

Central
Saint Michael's
Sixth Form

A UNIVERSITY-STYLE SIXTH FORM

BTEC National Diploma in Applied Science Biomedical science and Analytical & Forensic science



Welcome to Applied Science at Central Saint Michael's Sixth Form! This is your Summer starter pack for BTEC APPLIED SCIENCE, which you've chosen to take this September. The pack is designed to give you a head start in BTEC science.

Many of you will have come from GCSE exam based learning and not be used to the BTEC format, some of our internally marked work is heavily coursework based and you will need to complete long and short independent projects.

The work in these packs will take a long time, so you can break it up. Don't feel you need to complete it all in one go! You can complete the tasks in this booklet in any format you like, for example office documents like Word or PowerPoint. We use an online system for grading work in the sixth form so if at all possible use some of your time getting to know the aforementioned software. Of course if you would like to complete the work here by hand that is also fine. **You will need to bring your completed work along with you when you start sixth form in September**

If you have any questions please do not hesitate to contact the BTEC team,

Karen.thompson@sandwell.ac.uk – BTEC APPLIED SCIENCE

Avtar.singh@sandwell.ac.uk – BTEC APPLIED SCIENCE

Ade.oduloju@sandwell.ac.uk – BTEC FORENSIC AND MEDICAL SCIENCE

About the course

The BTEC National Diploma in Applied Science (NQF) will be delivered over 2 year(s).

There are six mandatory units and two optional units.

Mandatory Units 1 and 5 are traditional examinations available to do in January and June. Unit 3 is a practical-based, externally-assessed task to be completed over a three-week period determined by Pearson. There will be a December/January and an April/May assessment opportunity. Mandatory Units 2, 4 and 6 are internally set and take the form of assessed assignments. Two internally-assessed optional units are required to complete the National Diploma programme.

We take pride in teaching and ensure that all the content is covered so that learners are fully prepared for the assessments: you will have two weeks to complete an assignment, you will get feedback within two weeks, you will then have two weeks to resubmit if necessary. We expect that work submitted is your own and references to other work is appropriately referenced; we in turn will assess your work holistically and give you adequate feedback. Regarding exams, you will be given appropriate revision time, this will be made available before the examinations.

A summary of the units are tabulated below:

Applied Science
Unit 1: Principles and Applications of Science I
2 Practical Scientific Procedures and Techniques
3 Science Investigation Skills
4 Laboratory Techniques and their Application
5 Principles and Applications of Science II
6 Investigative Project
8 Physiology of Human Body Systems
14 Applications of Organic Chemistry

You can find information about any of the units by looking at the specification on the Pearson website.

BTEC Applied Science will include content from all three sciences and build upon your current knowledge in these areas whilst also allowing you to discover more about what it is like to have a career in science. Please look at the following professional scientific websites as they may contain information you may find useful both in your studies with us and beyond.

<https://www.rsc.org> The royal society of Chemistry

<https://www.rsb.org.uk> The royal society of Biology

<http://www.iop.org> Institute for Physics

Your tasks

Complete a minimum of one task from each section, of course you can complete as many as you choose, all work will help you in your early assignments whether it is with the content or learning how to research effectively.

Biological sciences – Please choose at least one of the following

- You have begun work at the local school and have been asked to create a poster which details the inner workings of a cell of your choice, can you tell the pupils how your cell differs from other cells?

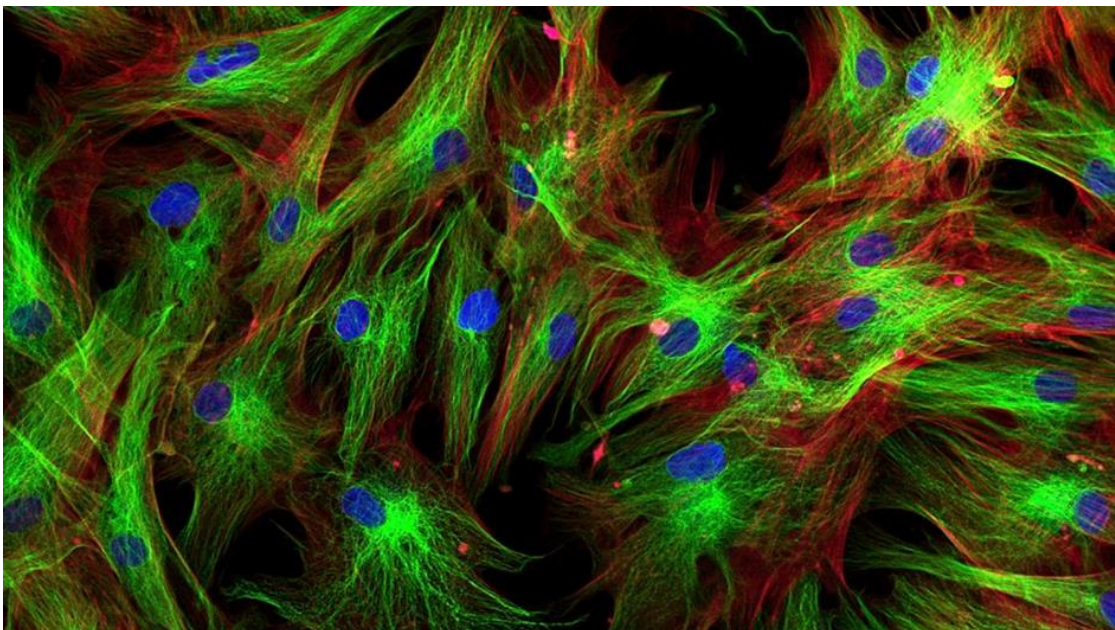
Things to include: a brief explanation of different types of cell for example plant, animal, bacterial, the job your chosen cell does and where it can be found, what organelles it contains.

- You are the head chef of a prestigious restaurant, you need a visual guide to explain health and safety requirements in the kitchen, can you explain why hand hygiene and preventing of cross contamination will stop your customers from getting ill?

Things to include: What is cross contamination? What is Salmonella and E-coli? How can temperature, correct storage and hand hygiene prevent illness

- You have just got a job at the local water authority, here you are in charge of their PR department and have been asked to summarise how the water is treated at the treatment works for a leaflet that will get sent to customers.

Things to include: Where does the water that needs treating come from? What processes happen to it inside the treatment works and why does it need to happen.



Physical sciences – please choose one of the following

- You are a radiographer; you regularly use radioactivity to make images of people. You need a leaflet or poster that explains to people what the different types of radioactivity are and how they can be damaging to people, will patients understand why you wear a lead gown?

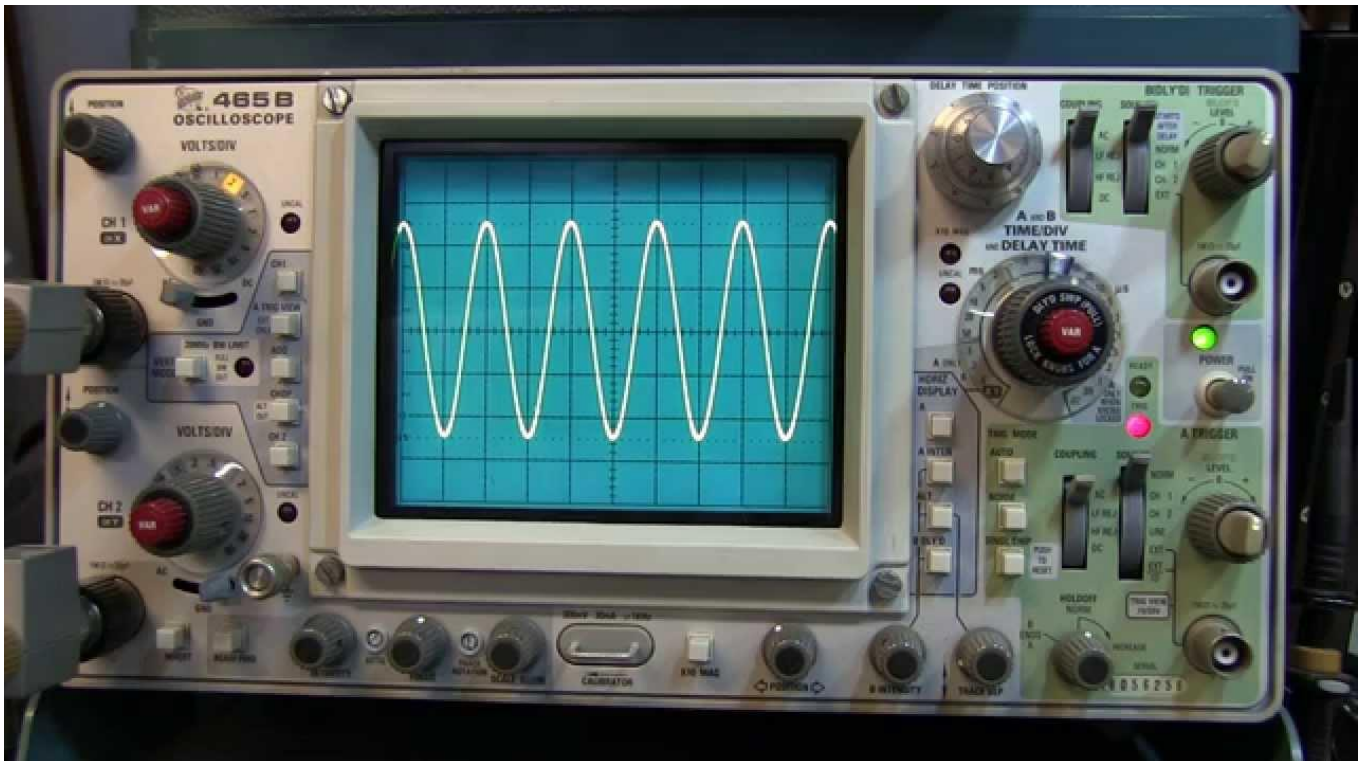
Things to include: Types of radiation (alpha, beta and gamma radiation) definition of radioactivity, thickness of materials that can stop each radiation type, effects of radiation on people.

- You have started work as a technician and have got to update the measuring equipment. List all the equipment that is found in a typical laboratory, can you explain each piece of equipment and how it should be used safely?

Things to include: An image, description and safety information for as many pieces of glassware and other equipment you can think of in the typical laboratory

- You work for a theatre company and are designing a new set, you have been asked by your boss to research and explain to the rest of the team the properties of sound waves and how they interact with different materials.

Things to include: What type of wave sound is, how it travels, is reflected, refracted or absorbed, what creates an echo? Why are acoustics important to theatre companies?



Chemical sciences – Please choose at least one of the following

- You are working for a chemical supply company, you have just mixed up some products which were about to be labelled and need a quick way to identify them. You know that they were all products that had different pH values. Explain pH and what you would expect to see if some of the products were acidic, alkaline or neutral when you tested them with universal indicator.

Things to include: What is pH? What does logarithmic mean? What does the colour change mean? Why should you be careful when handling acidic and alkaline materials? What is neutral?

- You work at a local primary school and have been put in charge of explaining to the children what the word **reaction** means. Will the children be able to tell if a reaction is endothermic or exothermic?

Things to include: as many types of reactions as you can, explain key terms such as endothermic and exothermic, what other examples of reactions could you explain to them

- You are entered onto the mentor programme at the college, this means you are asked to help your peers with revision. One of your friends does not understand the concept of the mole. You know all about Avogadro's constant (or you know how to find out about it), so you prepare some revision material for your friend that helps them to understand all about the relationship between Moles, mass and molar mass.

Things to include: You should include a brief explanation of the periodic table and what it shows, what is the atomic number, what is a chemical symbol, how to use the periodic table to calculate molar mass, Avogadro's number.



Communication in Science – Please complete all of these tasks

Task 1 : Research

Go on to the internet, find out about a science related topic of your choice and present it in **any** way you choose.

Task 2 : Summarisation

Watch at least one science documentary and summarise it in 500 words or less.

Task 3 : Revision

Go to one of the following websites and create a mind-map of the subject to use for revision purposes.

Selected Topics in SCIENCE COMMUNICATION

Lars Lindberg Christensen
Hubble European Space Agency Information Centre

Download "A Guide to Science Communication" (PDF) at
<http://www.esa.org/~MIRIS/scocomm>

Science Communication is a complex topic with a highly interwoven fabric of issues into crossing and influencing each other: product types, target groups, written communication, visual communication, validation processes, production of efficient workflow, distribution, promotion, advertising etc. etc.

Experiences from our daily work in the Hubble European Space Agency Information Centre have been collected in a free web book called "A Guide to Science Communication". This book aims at giving new science communicators a kick start into the field by summarizing our own and other's science communication results and experiences.

It has simple explanations of the concepts and illustrative examples. Get general information about science communication: literature, web links, glossary, and more specialized information about a range of topics of which a few are presented below.



Read also about target groups, product types, why you should not choose a Content Management System for your web pages, which communication and media laws ...

Monetary incentives, sports cars and loans in the pub tonight are gladly accepted ...