

BTEC Applied Science Course

This bridging work **MUST** be completed by the time you start your course and it will be assessed in September. The aims are for you to be ready to start learning at post 16 level.

What do you do in your first year? This course is a BTEC National Level 3 course and is the equivalent to 1 A Level. The course you will be studying will be the Extended Certificate in Applied Science. You will have to complete 4 units of which 3 are mandatory and 2 are external. Mandatory content (83%). External assessment (58%).

The Units that are compulsory are:

- Unit 1: Principles and Applications of Science I
- Unit 2: Practical Scientific Procedures and Techniques
- Unit 3: Science Investigation Skills.

Summer Bridging Work- **ESSENTIAL** Task

1: Draw and label the internal structure of an animal, plant and bacteria cell. Remember to include all the different organelles that you would see if you were to observe the cells through an electron microscope.

Task 2: Draw the electronic structure of the first 20 atoms in the periodic table. Explain the electronic structure of the different groups and periods in the periodic table. Make sure that you can draw dot and cross diagrams to help explain the general properties of covalent, metallic and ionic bonding.

Task 3: Explain the similarities and differences between the two types of waves (longitudinal and transverse). Draw a wave and label the important parts of the wave. Learn the properties of the different waves that are found in the Electromagnetic Spectrum.

Summer Bridging Work- **RECOMMENDED TASK**: Math will play a very important role in BTEC Applied Science. Ensure that you are able to perform simple conversions between units. Also that you are able to write numbers in standard form. Required Resources A lot of the work will be word processed so you need to have access to a computer or laptop. Also you will need to work independently and carry out a lot of research for which the internet will be very helpful. A Level books in all three sciences will help throughout the course.

You will be producing 3 posters or information leaflets, one for each of biology, chemistry and physics, to cover criteria set out below. It is up to you whether it is handwritten, done electronically or a mixture of both. There is no minimum / maximum size for the poster. The information you use should be **clearly referenced** and be your own work e.g. not plagiarised.

Biology assignment

Cells are the building blocks of life and any Biologist must have a firm grasp of the organelles and structures which make them up. You will have already studied the cell as the fundamental building block of organisms at GCSE. In order to study organisms in more detail we need to ensure our knowledge of the functions of different organelles within cells is spot on. Scientists who work with living things need to be able to predict the outcome of substances on different organisms at a cellular level. Whether this is in drug development, pioneering research into the use of therapeutic STEM cells or genetic engineering an in depth knowledge of cell workings is essential.

To prepare you for your BTEC course you must revisit your knowledge of Eukaryotic cells from GCSE and produce an information poster or leaflet. This research task will help you review these organelles, gain an insight into the relative sizes of cells and organelles and provided an introduction to the equipment we use to study them.

Criteria

Introduce Eukaryotic cells

Give some examples of different types of Eukaryotic cell

Give some examples of cell organelles stating structure and functions

Some diagrams to illustrate

What are the relative sizes of organelles

Ways in which organelles can be viewed

Chemistry assignment

One of the key concepts you will be examined on in Chemistry is atomic structure and bonding. Scientists and technicians working in the chemical industry need to have an understanding of atoms and electronic structure.

This allows them to predict how chemical substances will react in the production of a wide range of products – anything from fertilisers in the farming industry to fragrances in the perfume industry.

Metals play an important role in the construction industry, in providing structure to building, as well as in electrical wiring.

So understanding the chemical and physical properties of metals is essential when selecting building materials.

To prepare you for your level 3 BTEC course , you must revisit your knowledge on atomic structure and bonding from GCSE and produce an information poster/leaflet on the 3 different types of bonding; ionic and covalent

Criteria

Introduce bonding by considering the structure of an atom and why atoms form bonds

A diagram to show each type of bonding

State when each type of bonding occurs

Examples of substances with each type of bonding

Properties of each type of structure

Explain the different properties

Physics assignment

One of the key concepts you will be examined on in Physics is waves. Knowledge of waves is essential in a wide range of industries and organisations. In the communication industry, scientists and technicians apply their knowledge of the electromagnetic spectrum when designing mobile phone and satellite communication, and fibre optics are used to transmit telephone and television signals. Fibre optics are also used in diagnostic tools in medicine.

To prepare you for your level 3 BTEC course, you must revisit your knowledge on the electromagnetic spectrum produce an information poster on the different parts of the spectrum, their dangers and their uses.

Criteria

A diagram showing the electromagnetic spectrum and the typical wavelengths and frequencies for each region of the spectrum. You may also want to describe some general properties of these waves, such as their speed.

Mention at least two ways that each part of the spectrum can be used (e.g. microwaves are used for cooking, and also in mobile phones).

With the exception of radio waves, explain the possible dangers to the human body for each region of the spectrum