BTEC National Extended Certificate in Applied Science.

As part of your BTEC level 3 qualification you will be completing coursework and also sitting an external exam assessing you on some of the key concepts in Biology, Chemistry and Physics. Each Science subject will build on knowledge from your GCSE work and develop these concepts further relating them to use in industry and everyday life. In order to best prepare you for September we would like you to undertake a few tasks to do some ground work on a couple of topics we will cover in Unit 1 Principles and Applications of Science

. All work must be completed and brought to your first BTEC lesson. The information you use must be clearly referenced using at least 3 different sources and be your own work e.g. not plagiarised.

Summer Task:

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 first unit in your level 3 BTEC, you must revisit your knowledge of Eukaryotic cells from GCSE and produce an information poster. 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
- Investigate the different types of Eukaryotic cell
- List cell organelles stating structure and functions
- Diagrams to illustrate
- 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 first unit in your level 3 BTEC, you must revisit your knowledge on atomic structure and bonding from GCSE and produce an information poster on the 3 different types of bonding; ionic, covalent and metallic.

Criteria

- Introduce bonding by considering the structure of an atom and the arrangement of electrons in an atom.
- Describe how outer electrons link to reactivity.
- 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 first unit in your level 3 BTEC, 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.

- You need to 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