Bridging work BTEC applied science – level 3

INTRODUCTION

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 for us to get to know you and for you to do some ground work on a couple of topics we will cover in Unit 1 Principles and Applications of Science. In addition to the unit 1 work we would also like you to complete some coursework that will be submitted to the exam board as part of unit 2. All work must be completed by September 1st 2017 and brought to your first BTEC lesson.

For unit 1 you will be producing 3 posters, 1 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 but the best pieces will be displayed in the BTEC classrooms for reference so ideally the larger, the better. The information you use must be clearly referenced using at least 3 different sources and be your own work e.g. not plagiarised.

Your work will be assessed and judged to be in the following categories; pass, borderline or fail. In order to pass your GCSE to BTEC bridging assignment you must meet all parts of the criteria outlined below for each subject.

For the unit 2 work you will be producing a summary of the practical skills that you have acquired during your GCSE science studies.

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 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 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
Coursework assignment

Learning aim D of unit 2 is a “Review personal development of scientific skills for laboratory work”. As part of your analysis and evaluation of the skills that you will develop as part of the BTEC applied science course you will need to consider the skills that you have already gained from your science education so far. You will need to produce a report summarising your skill development across all the practical work in your science GCSE. It is up to you to choose whether it is handwritten or typed up on a computer. You should include equipment from all 3 sciences, for example, measuring cylinders, stopwatches, Bunsen burners, balances, microscopes, quadrats, electrical circuits and lenses. This list isn’t complete and you should include all the skills that you have learnt not just those listed.

Criteria

For each skill you should include

- A description of what the skill is used for eg. measuring cylinder is used for accurately measuring out volumes of liquids
- A method on how to carry out the skill, including technical considerations eg. the meniscus when using a measuring cylinder.
- How you can make sure you are working as accurately as possible.
- Any safety requirements that need to be considered.