Applied Science Diploma

Get ready for a successful start!

What will I study?	In Applied Science you will study a mixture of biology, chemistry and physics. This will involve assignments based around experimental and research work in addition to examined units. You will be studying the Pearson BTEC Level 3 National Diploma in Applied Science specification (units 1-6, 8 and 11) which can be found here: **https://qualifications.pearson.com/content/dam/pdf/BTEC-Nationals/Applied-Science/2016/specification-and-sample-assessments/BTEC-L3-Nat-Dip-in-Applied-Science-Spec.pdf**
Who teaches this course?	You will be taught by our team of experienced specialist biology, chemistry and physics teachers.
What resources or equipment will I need?	You will be provided with information booklets and electronic resources. To each lesson you will need to bring: ▪ a pen ▪ a pencil ▪ lined paper ▪ a ruler ▪ highlighters ▪ a scientific calculator ▪ a folder to keep your notes and resources organised A curious mind!
Reading List	Books (optional) Revise BTEC National Applied Science Revision Guide, ISBN: 9781292327648 Online BTEC Applied Science Help videos: https://www.youtube.com/@btecappliedsciencehelp
How can I extend my learning?	When you start the course, your first topics will be about the following content: • Structure and function of cells and tissue (in biology) • Atoms and electronic structure (in chemistry) • Waves and optical fibres (in physics) To prepare for this complete some advanced learning on these three topics using the guidance in the specification linked above.

Taster Activity: To be completed and brought to your first lesson

Resources needed to complete the activity:	Internet access and worksheet
Estimated time to complete the activity:	2-3 hours

Task 1:

Complete the two attached worksheets about atomic structure.

Task 2:

Draw diagrams of plant and animal cells and label each of them using all the structures in the table below in task 3.

Task 3:

Use this table, or draw your own, to briefly describe the structure and function of each organelle found in plant or animal cells. (The first organelle has been completed for you as an example).

Organelle	Structure	Function
Cell surface membrane	It consists mainly of a phospholipid bilayer containing proteins. It also has cholesterol, glycoproteins and glycolipids	Partially permeable to control entry and exit of substances. Glycoproteins and glycolipids are involved in cell recognition and communication and cholesterol controls the stability of the membrane
Nucleus		
Mitochondria		
Chloroplast (plant)		
Golgi apparatus		
Golgi vesicles		
Lysosomes		

Ribosomes		
Rough Endoplasmic Reticulum		
Smooth Endoplasmic Reticulum		
Cell Wall		
Cell Vacuole		

ATOMIC STRUCTURE (A)

1 This question is about the structure of atoms.

a Name the three particles that are found inside atoms.

.....

b Which of these particles are found inside the nucleus of the atom.

.....

c Which of these particles is neutral? .....

d Which of these particles has a negative electric charge? .....

e Which of these particles has a positive electric charge? .....

2 This question is about $^{27}_{13}Al$ atoms.

a How many protons, neutrons and electrons are in this atom?

protons = ... neutrons = ... electrons = ...

b What is it that makes this an atom of aluminium? .....

.....

3 Geiger and Marsden carried out an experiment where they fired alpha particles at a thin piece of gold. A small number of alpha particles were deflected or bounced back. This experiment led to Rutherford developing a new model of the atom.

a Why do most of the alpha particles pass straight through the gold atoms? .....

.....

.....

b Why do some of the alpha particles deflect or bounce back? .....

.....

.....

c Give two key differences between Rutherford's model of the atom and the Thomson's plum pudding model that it replaced.

1.....

2.....

4 **a** Define the term atomic number. .....

b Define the term mass number. .....

ATOMIC STRUCTURE (B)

1 This question is about $^{23}_{11}Na$ atoms.

a How many protons, neutrons and electrons are in this atom?

protons = ... neutrons = ... electrons = ...

b What is the atomic number of this atom? .....

c What is the mass number of this atom? .....

d The diameter of this atom is 360 pm. State this in metres in standard form. .....

2 There are two isotopes of copper, which are shown in the table.

Isotope	$^{63}_{29}Cu$	$^{65}_{29}Cu$
Abundance	69.2%	30.8%

a Calculate the relative atomic mass of copper. .....

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.....

b Explain why they are both atoms of copper. .....

.....

c State similarities and differences between these atoms in terms of their numbers of protons, neutrons and electrons.

similarities .....

.....

differences .....

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