

Pearson BTEC Level 3 National Extended Certificate in Applied Science



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Introduction to BTEC

The applied science sector is diverse and wide-ranging, including, for example, biomedical, forensic, physical and chemical sciences. There are approx. 5.8 million people employed in applied science occupations in the UK. This equates to approximately 20% of the workforce. The applied science sector has a crucial role to play in delivering economic growth in the UK and allowing companies to compete in a rapidly enlarging global market.

The Pearson BTEC Level 3 National Extended Certificate in Applied Science is intended to be an Applied General qualification for post16 students wanting to continue their education through applied learning and who aim to progress to higher education, and ultimately to employment, possibly in the applied science sector. The qualification is equivalent in size to one A level.

Universities and employers recognise this qualification. You are graded at a pass, merit, distinction or distinction*, equivalent to an E, C or A in an A-level course. You are in control of your coursework and therefore you can achieve high grades with hard work and dedication to the course. Last year around 75% of students achieved a merit or above. Throughout the course, you have the opportunity to develop all of the skills you would at A-level, along with the additional skills needed to complete this course including interpersonal and practical skills, effective teamwork, good use of time and working to deadlines and taking on board feedback to improve.

What will you study?

Year 12	Year 13
Unit 1 – Exam (25%) 33% Biology 33% Chemistry 33% Physics	Unit 3 – exam based on investigations carried out in biology, chemistry and physics and practical skills (33%)
Unit 2 – 4 pieces of coursework (25%) Based on 4 different investigations you carry out including titration, chromatography, colorimetry and cooling curves.	Diseases and Infections (17%) 4 pieces of coursework

The transition work in this booklet will enable you to access the first exam module and gives you the opportunity to show your writing skills, as coursework is a key part of this course. This booklet will be taken in and assessed by your teacher in September.

Chemistry – Atoms and Electronic Structure

Define the following terms:

Atom:

Ion:

Compound:

Mixture:

Molecule:

Identify which are elements, compounds or molecules – explain your answer for each

O₂

Na

CO₂

K

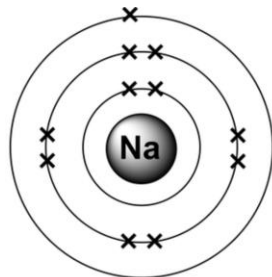
H₂O

CH₄

Cl₂

Draw the electronic structure for the following elements – the first one has been completed for you

Sodium



Potassium

Magnesium

Argon

Carbon

Fluorine ion

Lithium ion

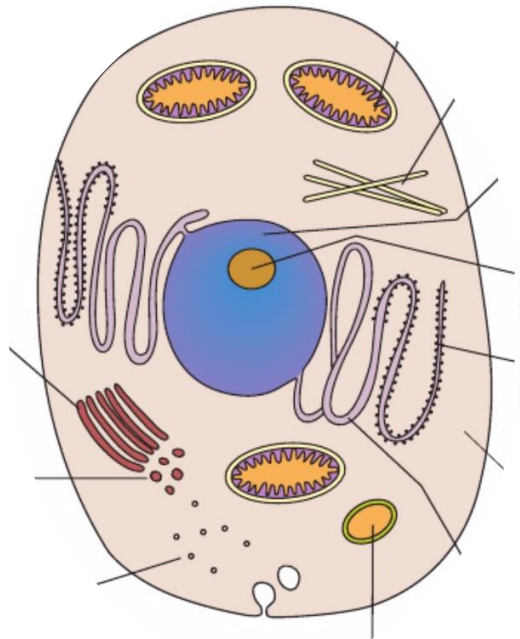
Aluminium ion

Chemistry – The Periodic Table

Complete the table

Symbol	Number of protons	Number of neutrons	Number of electrons
	2		
Li	3		
			6
F			9
O		8	
Na		12	
	15		
Cl		18	
K			19
		16	

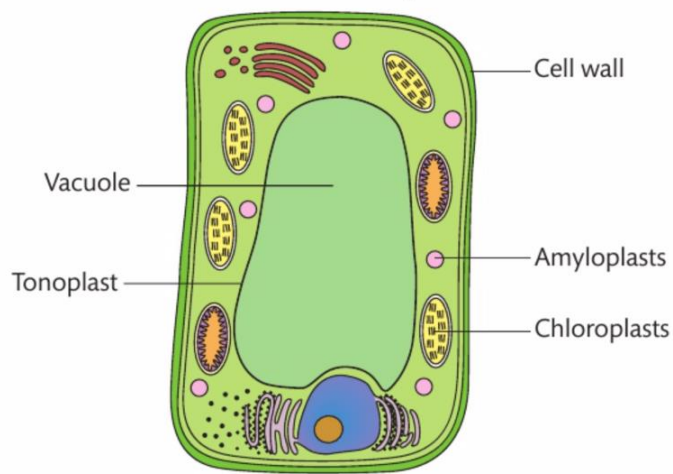
Biology



Animal cells – label the cell above and complete the table

Organelle	Description of Structure	Function
Plasma membrane		
Cytoplasm		
Nucleus		
Nucleolus		
Rough endoplasmic reticulum (ER)		
Smooth endoplasmic reticulum (ER)		
Golgi apparatus		
Vesicles		

Lysosomes		
Ribosomes		
Mitochondria		
Centrioles		



Plant cells – complete the table

Organelle	Description of Structure	Function
Cell wall		
Chloroplast		
Vacuole		
Tonoplast		
Amyloplast		
Plasmodesmata		
Pits		

Physics – Waves

Label the waves and explain the following words – remember to add units when appropriate

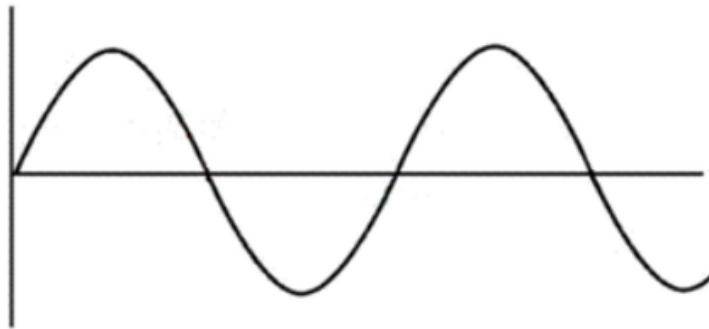
Wavelength

Amplitude

Crest/peak

Trough

Frequency



A series of horizontal lines for writing.

2. When metals react with hydrochloric acid, a salt and hydrogen gas produced. A learner investigates the reactivity series by reacting metals with hydrochloric acid.

Here is the learner's method:

- Place magnesium ribbon in a boiling tube
- Add hydrochloric acid
- Count the number of bottles of hydrogen produced
- Repeat for aluminium, calcium granules, copper, iron and zinc

The result of the lens investigation Ashanti table below

Metal	Number of bubbles
Magnesium	72
Aluminium	6
Calcium	97
Copper	0
Iron	19
Zinc	46

The learner concludes the metals in order of reactivity are

Most reactive	Calcium
	Magnesium
	Zinc
	Iron
	Aluminium
Least reactive	Copper

Evaluate the learner's investigation. You should think about the following:

- Method of the investigation – have appropriate variables been used, are the results valid, were there control variables present
- Results collected – was the method appropriate for the investigation
- Conclusions made – are the conclusions made correct based on the results, is there any way you could improve the investigation

A sheet of handwriting practice paper featuring 32 horizontal lines. The lines are evenly spaced and extend across the width of the page, providing a guide for letter height and placement.