



ST JOHN BOSCO COLLEGE
BATTERSEA



Pearson BTEC Level 3 National Extended Certificate in Applied Science



Introduction to BTEC.....	page 2
What will you study?	page 2
Transition work	
Chemistrypage 3
Biology.....	page 6
Physics.....	page 8
Planning an investigation and extended writing.....	page 9

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.	Physiology of Human Body Systems (17%) 3 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

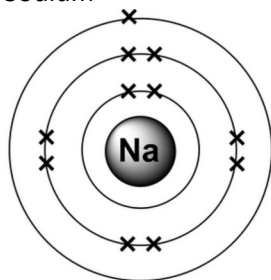
H₂O

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	

Outline the key features of the Periodic table

What patterns of reactivity are seen in group 1?

What patterns of reactivity are seen in group 7?

What are the key features of group 1 metals?

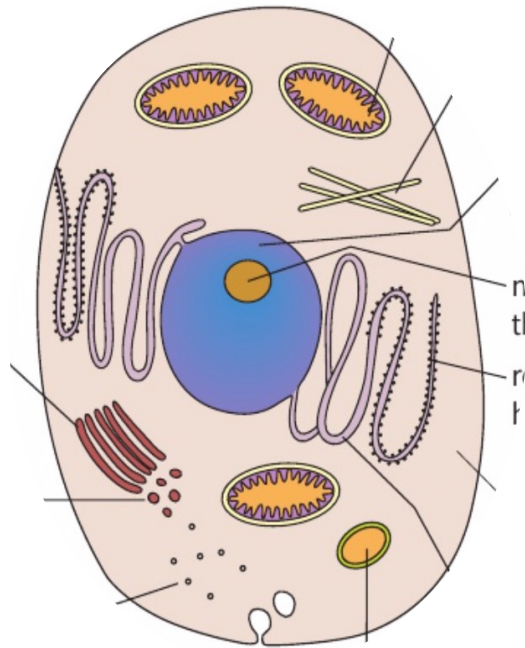
What are the key features of group 7 metals?

What are the key features of the transition metals?

The Periodic Table of Elements

1		2												3	4	5	6	7	0 (8)		
														<div style="border: 1px solid black; padding: 2px; display: inline-block;"> 1.0 H hydrogen 1 </div>						<div style="border: 1px solid black; padding: 2px; display: inline-block;"> 4.0 He helium 2 </div>	
		Key relative atomic mass atomic symbol name atomic (proton) number																			
(1)	(2)											(13)	(14)	(15)	(16)	(17)	(18)				
6.9 Li lithium 3	9.0 Be beryllium 4											10.8 B boron 5	12.0 C carbon 6	14.0 N nitrogen 7	16.0 O oxygen 8	19.0 F fluorine 9	20.2 Ne neon 10				
23.0 Na sodium 11	24.3 Mg magnesium 12	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	27.0 Al aluminium 13	28.1 Si silicon 14	31.0 P phosphorus 15	32.1 S sulfur 16	35.5 Cl chlorine 17	39.9 Ar argon 18				
39.1 K potassium 19	40.1 Ca calcium 20	45.0 Sc scandium 21	47.9 Ti titanium 22	50.9 V vanadium 23	52.0 Cr chromium 24	54.9 Mn manganese 25	55.8 Fe iron 26	58.9 Co cobalt 27	58.7 Ni nickel 28	63.5 Cu copper 29	65.4 Zn zinc 30	69.7 Ga gallium 31	72.6 Ge germanium 32	74.9 As arsenic 33	79.0 Se selenium 34	79.9 Br bromine 35	83.8 Kr krypton 36				
85.5 Rb rubidium 37	87.6 Sr strontium 38	88.9 Y yttrium 39	91.2 Zr zirconium 40	92.9 Nb niobium 41	95.9 Mo molybdenum 42	[98] Tc technetium 43	101.1 Ru ruthenium 44	102.9 Rh rhodium 45	106.4 Pd palladium 46	107.9 Ag silver 47	112.4 Cd cadmium 48	114.8 In indium 49	118.7 Sn tin 50	121.8 Sb antimony 51	127.6 Te tellurium 52	126.9 I iodine 53	131.3 Xe xenon 54				
132.9 Cs caesium 55	137.3 Ba barium 56	138.9 La* lanthanum 57	178.5 Hf hafnium 72	180.9 Ta tantalum 73	183.8 W tungsten 74	186.2 Re rhenium 75	190.2 Os osmium 76	192.2 Ir iridium 77	195.1 Pt platinum 78	197.0 Au gold 79	200.6 Hg mercury 80	204.4 Tl thallium 81	207.2 Pb lead 82	209.0 Bi bismuth 83	[209] Po polonium 84	[210] At astatine 85	[222] Rn radon 86				
[223] Fr francium 87	[226] Ra radium 88	[227] Ac* actinium 89	[261] Rf rutherfordium 104	[262] Db dubnium 105	[266] Sg seaborgium 106	[264] Bh bohrium 107	[277] Hs hassium 108	[268] Mt meitnerium 109	[271] Ds darmstadtium 110	[272] Rg roentgenium 111	Elements with atomic numbers 112-116 have been reported but not fully authenticated										
* Lanthanide series		140 Ce cerium 58	141 Pr praseodymium 59	144 Nd neodymium 60	[147] Pm promethium 61	150 Sm samarium 62	152 Eu europium 63	157 Gd gadolinium 64	159 Tb terbium 65	163 Dy dysprosium 66	165 Ho holmium 67	167 Er erbium 68	169 Tm thulium 69	173 Yb ytterbium 70	175 Lu lutetium 71						
* Actinide series		232 Th thorium 90	[231] Pa protactinium 91	238 U uranium 92	[237] Np neptunium 93	[242] Pu plutonium 94	[243] Am americium 95	[247] Cm curium 96	[245] Bk berkelium 97	[251] Cf californium 98	[254] Es einsteinium 99	[253] Fm fermium 100	[256] Md mendelevium 101	[254] No nobelium 102	[257] Lr lawrencium 103						

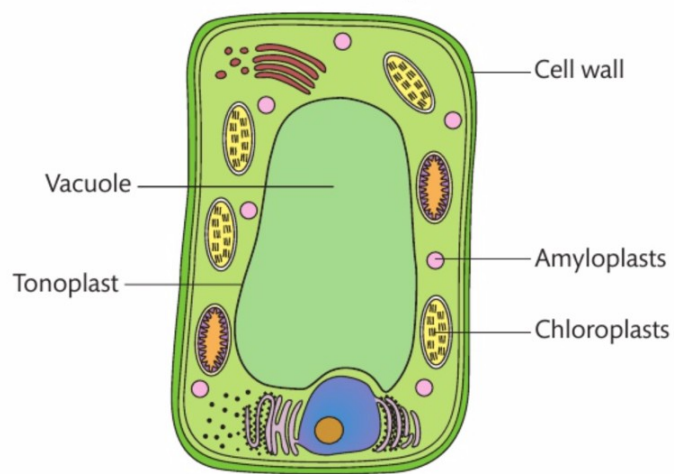
Biology



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

