The Friary Sixth Form

BTEC Applied Science Bridging Pack 2024

Course Expectations

This pack has been designed to help you bridge the gap from GCSE to Level 3 BTEC to ensure that you understand what you've let yourself in for and that you are ready for your new course.

What do I need?

Required Equipment
Pen, pencil, sharpener, rubber, highlighters, protractor, 30cm ruler, scientific calculator, A4 lever-arch folder with dividers.

How will I learn?

Over the course you will have around five hours of lessons a week that will cover all the theory and practical skills you will need.
You will be given homework questions every week and these will be expected to be completed by the next lesson in most cases.

You are expected to be spending six hours per week out of class completing homework, reviewing your work and reading around the subject.

In addition to the lessons you will receive, there is plenty of support available:

- Teachers: Your teacher is your first point of call as they are the experts – you will have two experienced teachers who will always offer their time when they are available to help you in and out of lessons.

- Notes: You will be expected to organise these in a folder and add any extra notes that you write in or out of lessons and bring these along to lessons where we will check these regularly.

- Textbook: You will be given access to a textbook. These have notes, questions and revision tips and quizzes.

  Specification and past papers: Download a BTEC specification from the website:
  http://qualifications.pearson.com/en/qualifications/btec-nationals/applied-science-2016.html

Staff

Mrs Williamson (jwilliamson@friaryschool.co.uk)
Mrs Barker (nbarker@friaryschool.co.uk)
Mrs Garner-Thorpe (agthorpe@friaryschool.co.uk)

Course Overview

BTEC Level 3 Extended Certificate in Applied Science

The Edexcel BTEC Level 3 Extended Certificate is completed in Year 13 with a total of 360 guided learning hours across four units. You will complete one internally assessed unit in Y12 and cover the content for the first external exam unit. In Y13 you will complete the remaining units and take both external exams.

Year 12

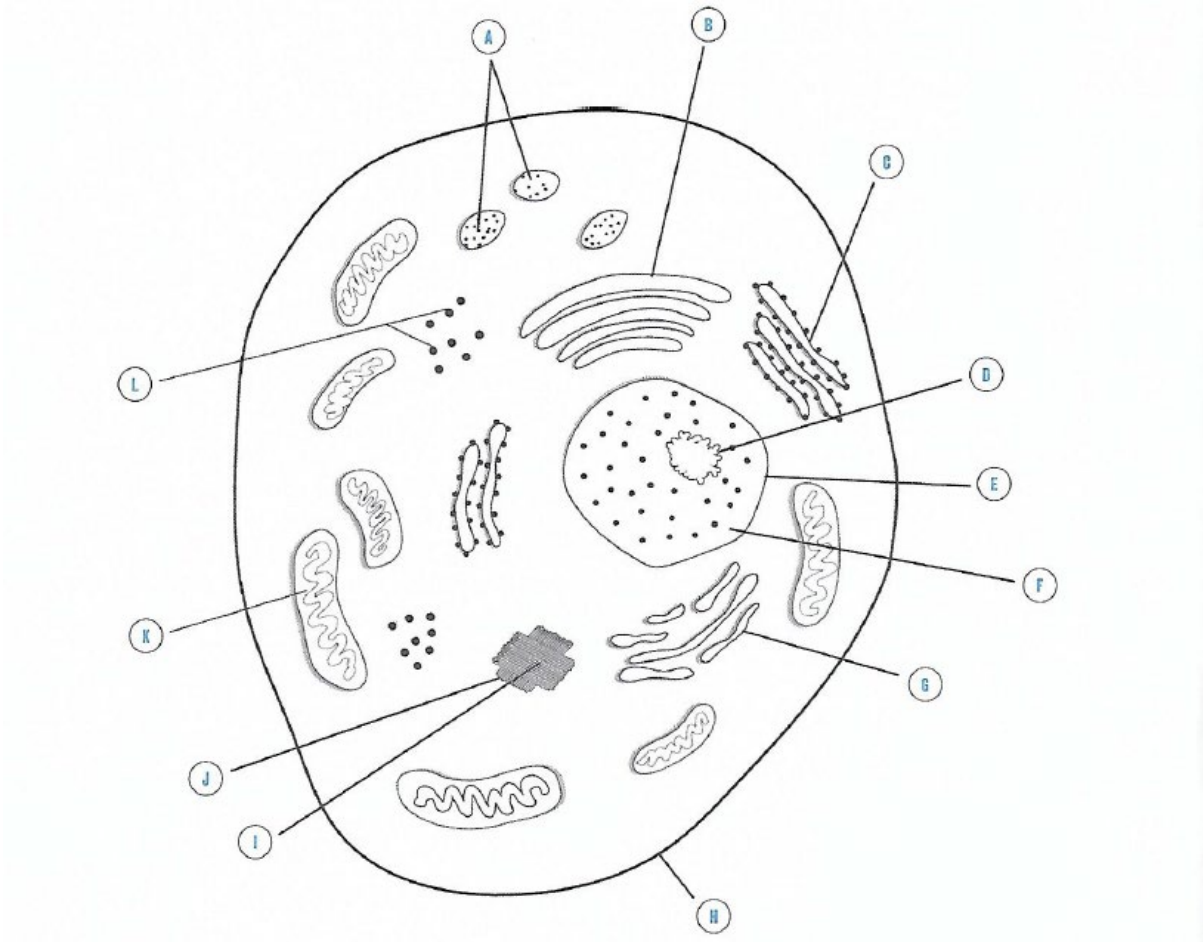
Unit	Title	Learning hours	Brief description	Assessment
1	**Principles and Applications of Science I**	90	Chemistry, biology and physics topics	External Three 40 minute exams worth 90 marks taken in Y13
2	**Practical Scientific Procedures and Techniques**	90	Practical techniques commonly used in chemistry, biology and physics laboratories	Internal - assignments

Year 13

Unit	Title	Learning hours	Brief description	Assessment
3	**Science Investigation Skills**	120	Investigation skills used in the science industry	External exam - practical task
8 Option	**Physiology of Human Body Systems**	60	Human lymphatic, musculoskeletal and digestive systems	Internal - assignments

Tasks: Biology

1. a) Research the organelles present in an animal cell using internet resources and the textbook. Colour the different parts and label them using the key below.



https://www.s-cool.co.uk/a-level/biology/cells-and-organelles/revise-it/organelles

Identify and label the following

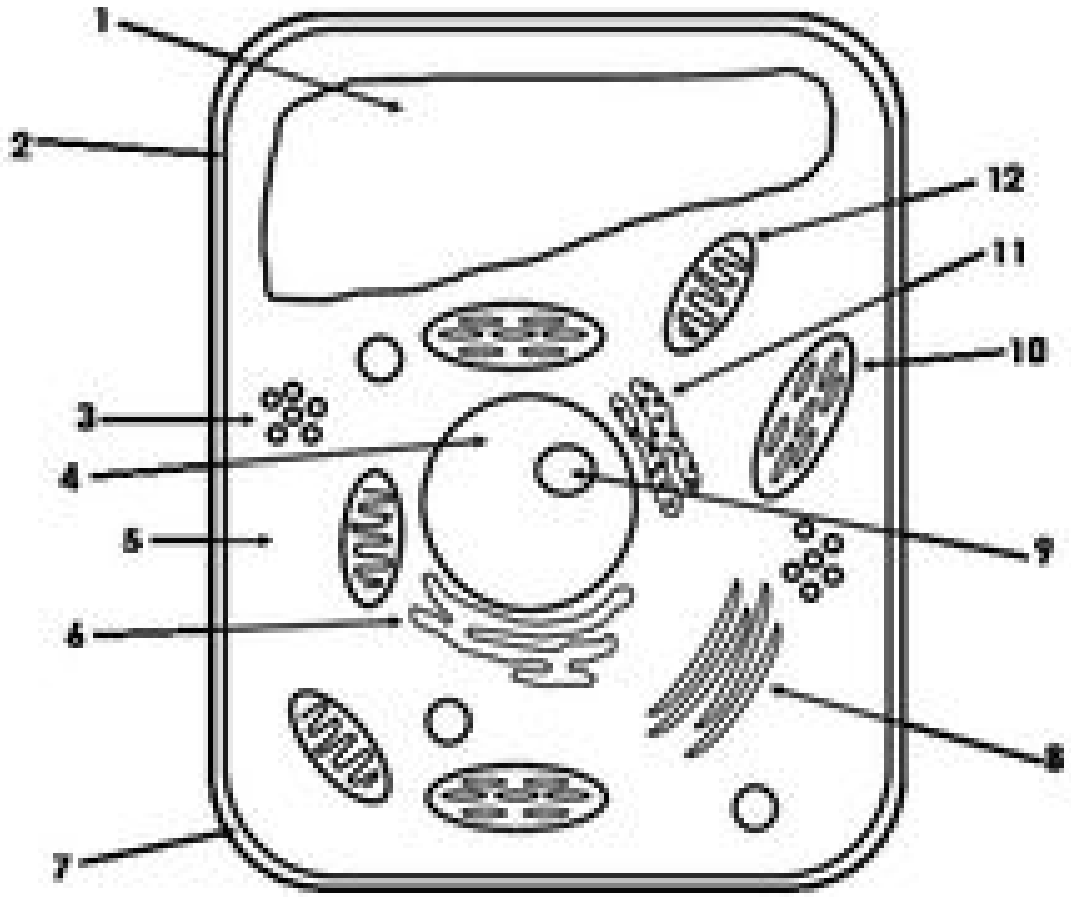
- ☐ Nucleus
- ☐ Nucleolus
- ☐ Smooth endoplasmic reticulum
- ☐ Rough endoplasmic reticulum
- ☐ Golgi apparatus
- ☐ Mitochondrion
- ☐ Cell membrane
- ☐ Ribosomes
- ☐ Centrioles
- ☐ Centrosomes
- ☐ Nuclear membrane
- ☐ Secretory granules

- Colour the nucleolus black
- Colour the cytoplasm of the nucleus yellow
- Colour the cytoplasm of the cell light blue
- Colour the Golgi apparatus pink
- Colour the mitochondria green
- Colour the smooth endoplasmic reticulum red
- Colour the rough endoplasmic reticulum brown
- Colour the secretory granules orange

b) Research the structure and function of each part listed below

Organelle	Structure	Function
Plasma membrane		
Cytoplasm		
Nucleus		
Nucleolus		
Rough endoplasmic reticulum		
Smooth endoplasmic reticulum		
Golgi apparatus		
Vesicle		
Lysosome		
Ribosome		
Mitochondria		
Centrioles		

2. a) Research the organelles present in a plant cell using internet resources and the textbook. Colour the different parts and label them using the key below.



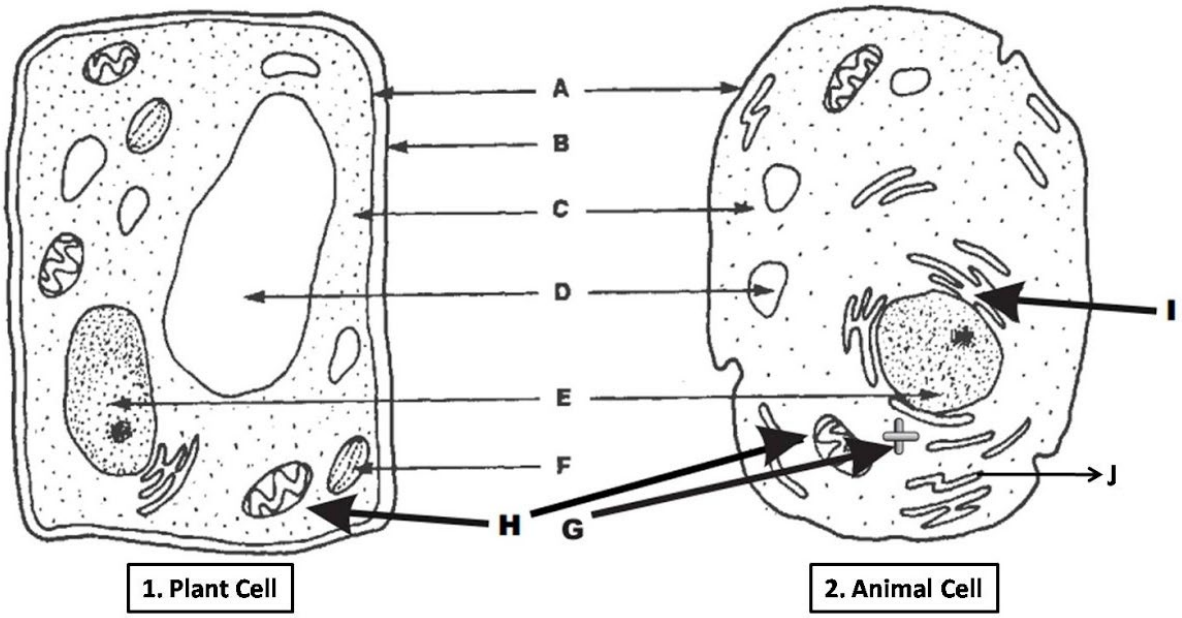
- Nucleus
- Nucleolus
- Smooth endoplasmic reticulum
- Rough endoplasmic reticulum
- Golgi apparatus
- Mitochondrion
- Chloroplast
- Cell membrane
- Cell wall
- Vacuole
- Ribosomes
- Centrioles
- Centrosomes
- Nuclear membrane
- Amyloplast

- Colour the nucleolus black
- Colour the cytoplasm of the nucleus yellow
- Colour the cytoplasm of the cell light blue
- Colour the Golgi apparatus pink
- Colour the mitochondria green
- Colour the chloroplasts purple
- Colour the smooth endoplasmic reticulum red
- Colour the rough endoplasmic reticulum brown
- Colour the vacuole orange
- Colour the amyloplasts grey

b) Research the structure and function of each part listed below

Organelle	Structure	Function
Plasma membrane		
Cytoplasm		
Nucleus		
Nucleolus		
Rough endoplasmic reticulum		
Smooth endoplasmic reticulum		
Golgi apparatus		
Vesicle		
Lysosome		
Ribosome		
Mitochondria		
Centrioles		
Cell wall		
Chloroplast		
Vacuole		
Tonoplast		
Amyloplast		
Plasmodesmata		
Pit		

3. Use the diagram to compare plant and animal cells.



Complete the table below to show similarities and differences between them

A _____ F _____

B_____ G _____

C_____ H _____

D_____ I _____

E_____ J _____

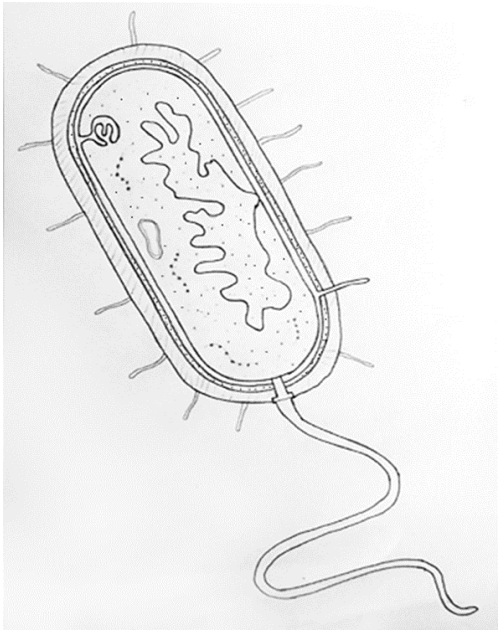
Similarities	
Differences	
Animal cells	Plant cells

4. Find out about prokaryotic cells

http://astarbiology.com/ib/1-2-prokaryotic-cells/

a) Label this diagram

.

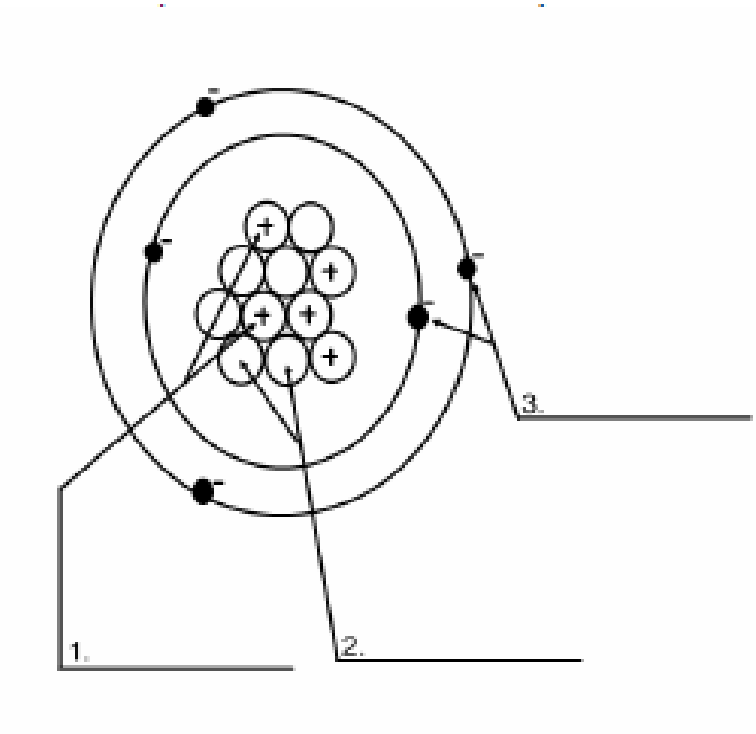


b) Research the structure and function of each part listed below

Organelle	Structure	Function
Cell wall		
Capsule		
Ribosomes		
Nucleoid		
Plasmid		
Cell wall		

Tasks: Chemistry

Label the parts of an atom below and answers the questions



4. What type of charge does a proton have?
5. What type of charge does a neutron have?
6. What type of charge does an electron have?
7. Which two subatomic particles are located in the nucleus of an atom?

8. If an atom has 35 protons in the nucleus, how many electrons will it have orbiting the nucleus?
9. What is the atomic number of the atom in the diagram above?
10. What is the atomic mass/mass number of the atom in the diagram above?
11. How many protons are in the nucleus of an atom with an atomic number of 15?
12. How many electrons are in the nucleus of an atom with an atomic number of 20?
13. How many neutrons are in the nucleus of an atom with an atomic number of 25? (use Periodic Table for mass)
14. What is the mass number of an atom with 3 protons, 4 neutrons, and 3 electrons?
15. How many neutrons are in the nucleus of an atom that has an atomic mass of 36 and an atomic number of 25?

2. Describe the difference between the plum pudding model of the atom and the nuclear model of the atom developed by Rutherford and Marsden. Include a diagram of each model.

Plum pudding model of the atom

Nuclear model of the atom

3. Electron arrangements of atoms

Using the periodic table to help you, complete the electron configurations of the first 20 elements

n	Shell	Number of electrons
1	1st shell	2
2	2nd shell	8
3	3rd shell	18
4	4th shell	32

You can find the total number of electrons in an atom by using the **atomic number**. This is defined as the **number of protons** in an atom, but for a neutral atom also equals the number of electrons.

Hydrogen H	Helium He	Lithium Li	Beryllium
Boron B	Carbon C	Nitrogen N	Oxygen O
Fluorine F	Neon Ne	Sodium Na	Magnesium Mg
Aluminium Al	Silicon Si	Phosphorus P	Sulphur S
Chlorine Cl	Argon Ar	Potassium K	Calcium

4. Bonding

Ionic bonding . https://www.bbc.co.uk/bitesize/guides/zyydng8/revision/1

1. What is an ion? How are they formed?

2. Describe in words the bonding between magnesium and oxygen and the charge on the ions formed.

Covalent bonding https://www.bbc.co.uk/bitesize/guides/zcpjfcw/revision/1

1. What is the difference between an ionic bond and a covalent bond?

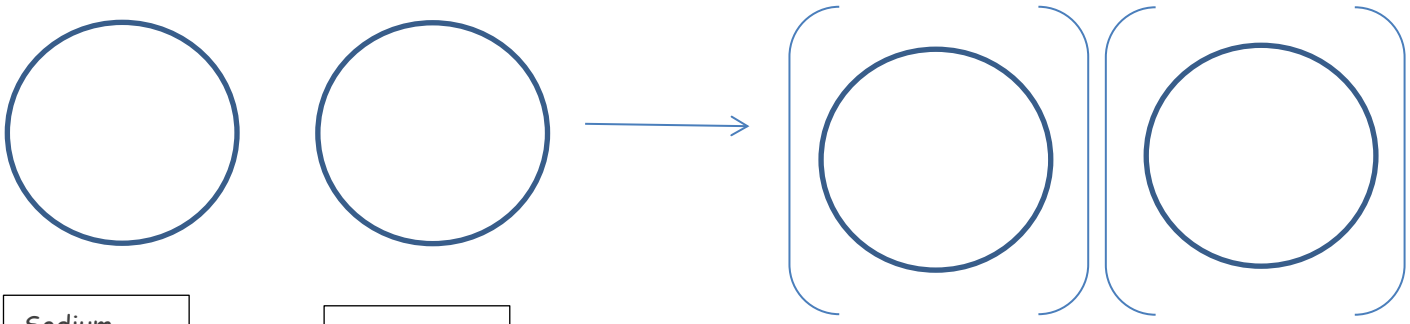
2. Why do atoms share electrons?

3. Which group of the periodic table do atoms 'try to be like'? How would you describe the atoms of elements in this group?

4. Draw the bonding, using dot and cross diagrams, for a molecule of chlorine.

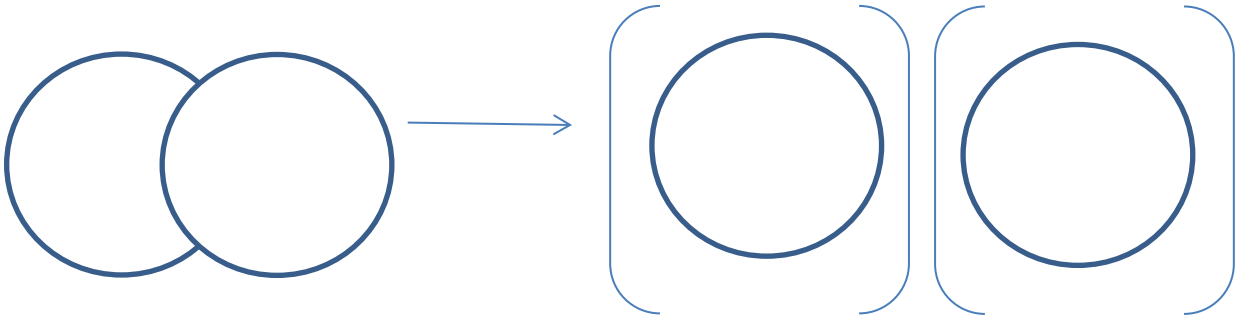
Ionic bonding: Complete the diagrams to show the electrons in each atom charge on the ions they form.

https://www.bbc.co.uk/bitesize/guides/zyydng8/revision/1



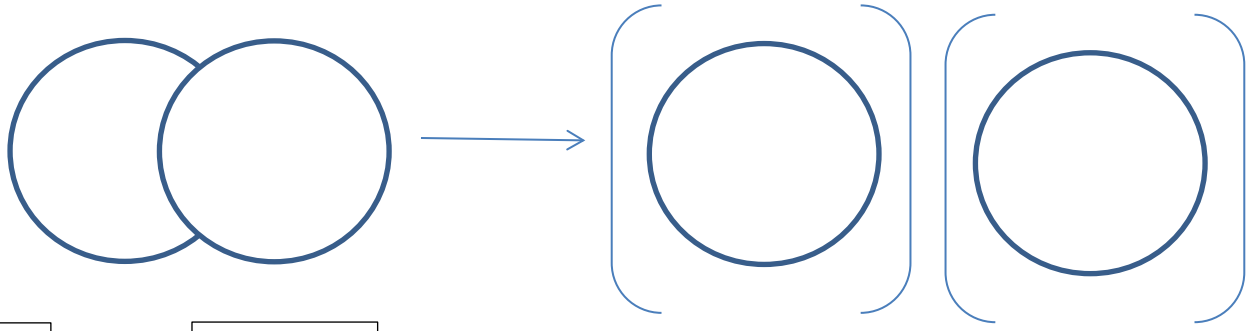
Sodium

Chlorine



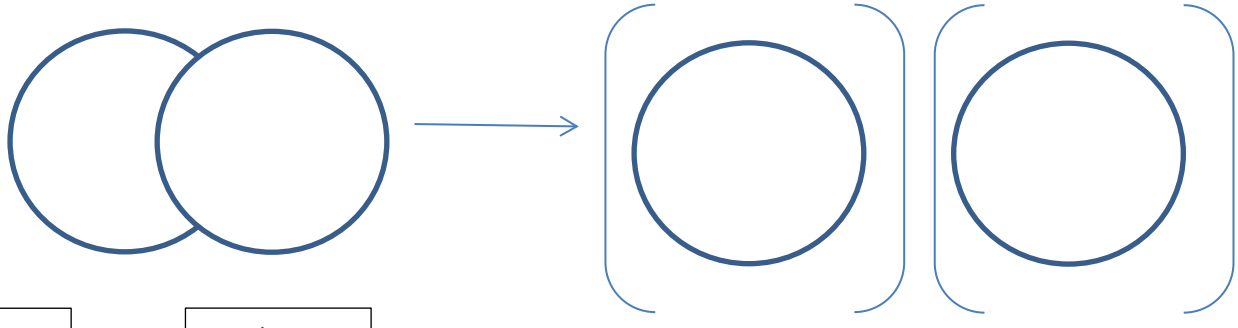
Potassium

Chlorine



Calcium

Oxide



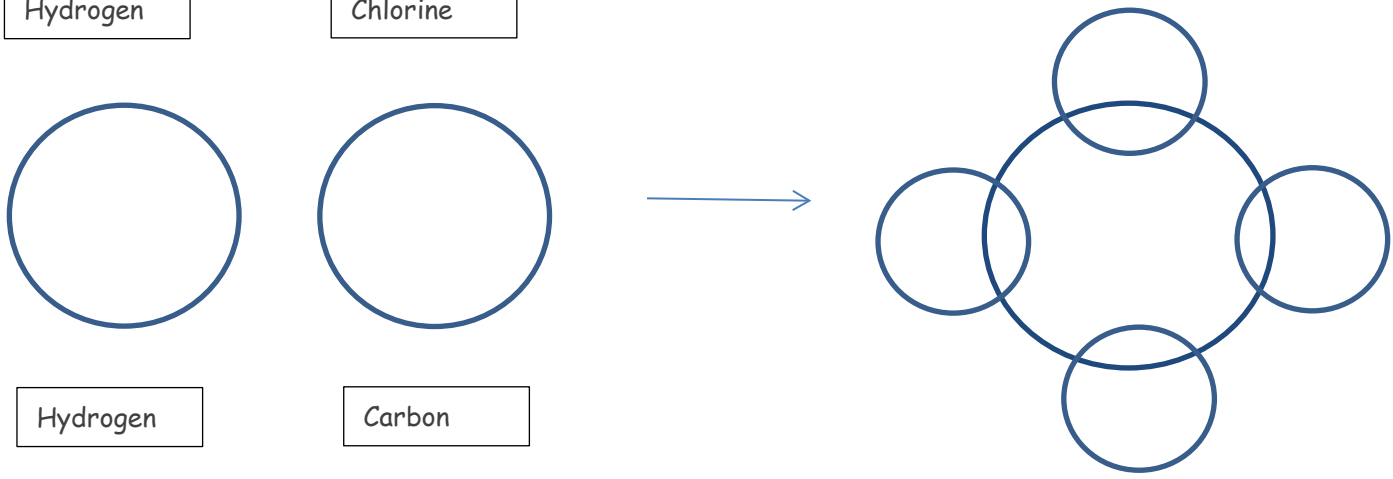
Magnesium

Oxide

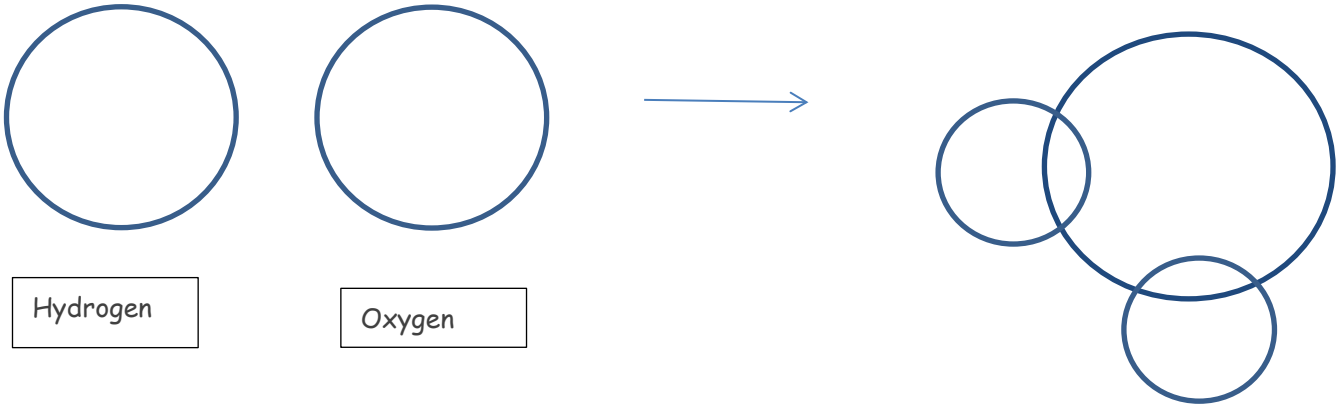
Covalent bonding: Complete the diagrams to show the electrons in each atom and in the covalent molecule they form. https://www.bbc.co.uk/bitesize/guides/zcpjfcw/revision/1

Hydrogen Hydrogen

Hydrogen Chlorine



Hydrogen Carbon



Hydrogen Oxygen

Tasks: Physics

1. Wave definitions
https://a-levelphysicstutor.com/wav-wave-props.php
https://www.bbc.co.uk/bitesize/topics/zcwkgdm

What is a wave?

Find definitions for the following:

Wavelength

Amplitude

Period

Frequency

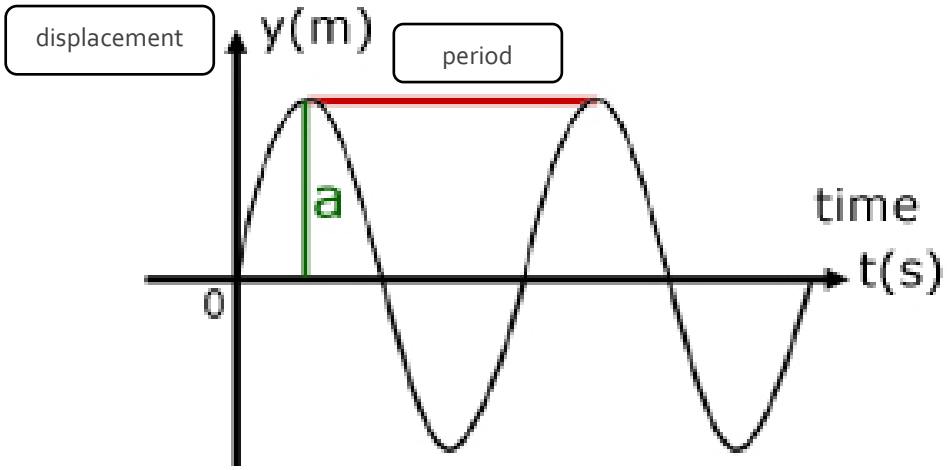
Rest position

Displacement

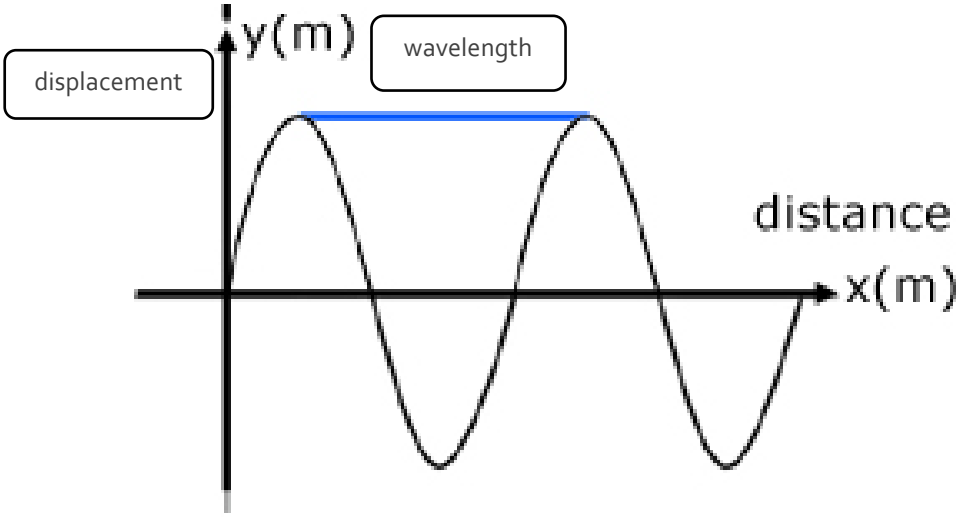
2. Period and frequency

On a displacement-time graph of a wave, period can be found by noting the time taken for one complete wave.

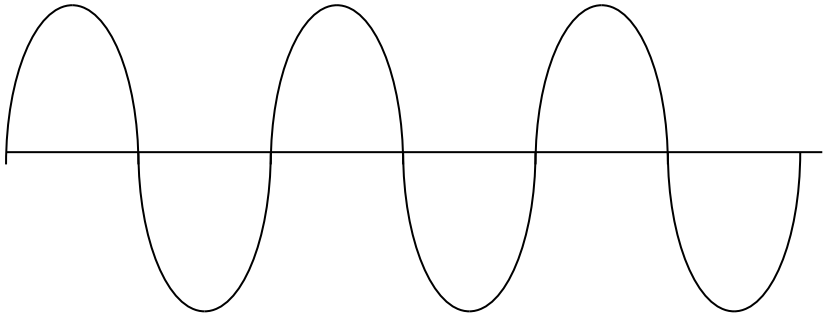
Amplitude can be read from the maximum height reached on the y-axis

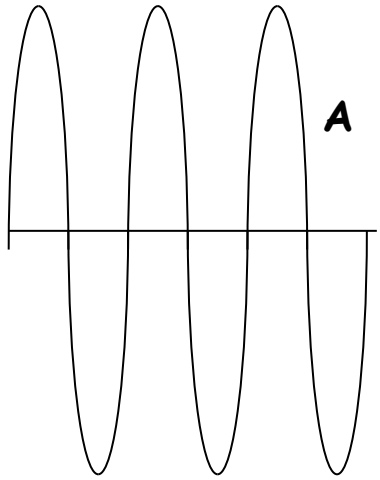


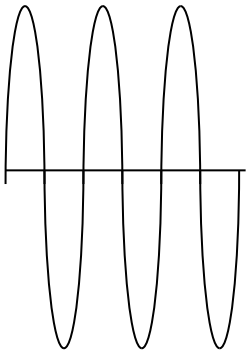
On a displacement-distance graph of a wave, wavelength can be found by noting the distance for one complete wave

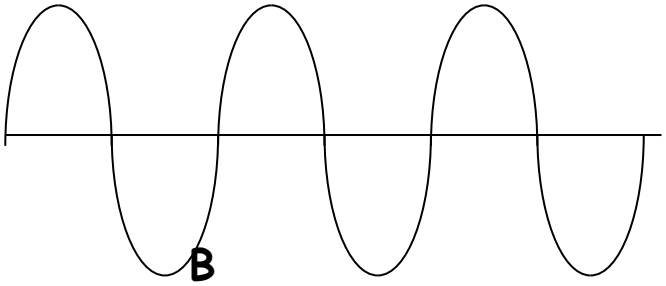


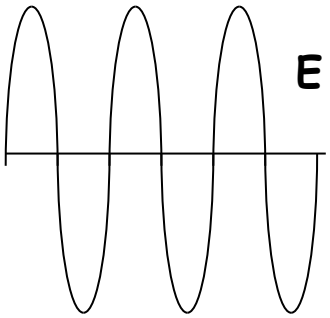
Label the amplitude and wavelength for each of the waves below. Once you have done this, answers the questions at the bottom of the worksheet in your book.

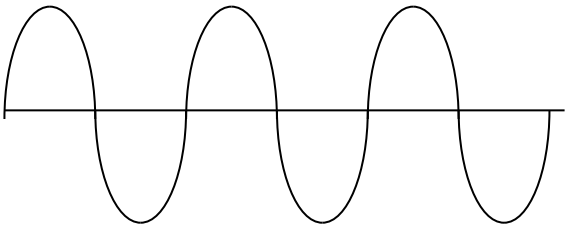












Which of the above waves has:
The highest frequency?
The shortest wavelength?
The largest amplitude?
The longest wavelength?

The lowest pitch?
The loudest intensity?
The smallest amplitude?

3. Transverse and longitudinal waves

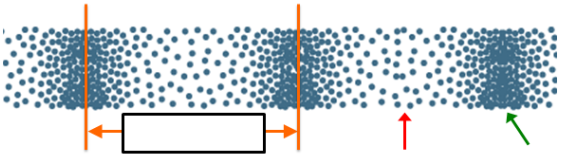
https://www.bbc.co.uk/bitesize/guides/z9bw6yc/revision/1

Find a definition for these two types of waves:

Transverse waves

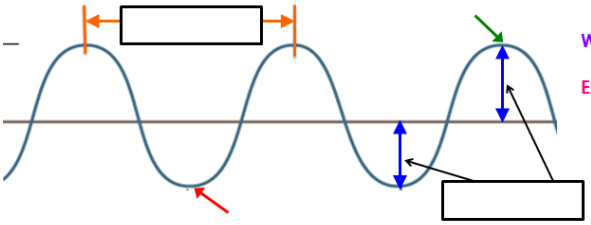
Longitudinal waves

Label and name these waves



Wave Name:

Examples:



Wave Name:

Examples:

Light (electromagnetic waves)

Sound

Compare light and sound waves – examples of criteria you could compare: transverse or longitudinal, needs a medium?, speed, frequency, uses

4. Using the wave formula: wave speed, frequency and wavelength

$$v = f \times \lambda$$

***v* speed** (metres per second, m/s)

λ wavelength (metres, m)

***f* frequency** (hertz, Hz)

$$f = v \div \lambda$$

$$\lambda = v \div f$$

Worked example:

Q: A sound wave of frequency 220 Hz travels at a speed of 340 m/s in air. What is its wavelength?

A: Wavelength, λ = v ÷ f = 340 ÷ 220 = ***1.55 m***

Prefix	Symbol	Power
atto	a	10^{-18}
femto	f	10^{-15}
pico	p	10^{-12}
nano	n	10^{-9}
micro	μ	10^{-6}
milli	m	10^{-3}
kilo	k	10^{3}
mega	M	10^{6}
giga	G	10^{9}
tera	T	10^{12}

1. Calculate the **wave speed** (in m/s) for the following waves:

a) A sound wave in steel with a frequency of 500 Hz and a wavelength of 3.0 metres.

b) a ripple on a pond with a frequency of 2 Hz and a wavelength of 0.4 metres.

c) A radio wave with a wavelength of 30 m and a frequency of 10,000,000 hertz.

2. Calculate the **wavelength** (in metres) for the following waves:

a) A wave on a slinky spring with a frequency of 2 Hz travelling at 3 m/s.

b) An ultrasound wave with a frequency 40,000 Hz travelling at 1450 m/s in fatty tissue.

c) A sound wave with frequency 440 Hz travelling at 340 metres per second in air.

3. Calculate the **frequency** (in Hz) for the following waves:

a) A sound wave of wavelength 10 metres travelling at 340 metres per second in air.

b) A wave on the sea with a speed of 8 m/s and a wavelength of 20 metres.

c) A microwave of wavelength 0.15 metres travelling through space at 300,000,000 m/s.

Tasks: Knowledge check

Biology			Now	Revisit 1	Revisit 2
Cells	Cell structure and function	Know that cell theory is a unifying concept that states that cells are a fundamental unit of structure, function and organisation in all living organisms.			
		Understand the ultrastructure and function of organelles in the following cells:			
		Prokaryote cells (bacterial cell): nucleoid, plasmids, 70S ribosomes, capsule, cell wall			
		Eukaryotic cells (plant and animal cell): plasma membrane, cytoplasm, nucleus, nucleolus, endoplasmic reticulum (smooth and rough), Golgi apparatus, vesicles, lysosomes, 80S ribosomes, mitochondria, centriole			
		Eukaryotic cells (plant-cell specific): cell wall, chloroplasts, vacuole, tonoplast, amyloplasts, plasmodesmata, pits.			
	Cell specialisation	Interpret microscope and electron micrograph images:			
		Recognise cell organelles from electron micrographs and the use of light microscopes.			
		Understand the similarities and differences between plant and animal cell structure and function.			
		Understand how to distinguish between gram positive and gram negative bacterial cell walls and why each type reacts differently to some antibiotics.			
		Understand cell specialisation in terms of structure and function:			
		Explain the structure and function of palisade mesophyll cells in a leaf			
		Explain the structure and function of sperm and egg cells in reproduction			
		Explain the structure and function of root hair cells in plants			
		Explain the structure and function of white blood cells			
		Explain the structure and function of red blood cells.			
Tissue structure and function	Epithelial tissue	Understand the structure and function of epithelial tissue to include:			
		Describe the structure and function of squamous epithelial tissue as illustrated by the role of alveolar epithelium in gas exchange			
		Describe, explain and interpret data on the effect of Chronic Obstructive Pulmonary Disease (COPD) and smoking			
		Describe the structure and function of columnar epithelial tissue as illustrated by goblet cells and ciliated cells protecting lungs from pathogens.			
	Endothelial tissue	Understand the structure and function of endothelial tissue:			
		Describe the structure and function of blood vessels in the cardiovascular system			
		Describe, explain and interpret the risk factors that damage endothelial cells and affect the development of atherosclerosis			

			Now	After lesson	After revision
Tissue structure and function	**Muscle tissue**	Understand the structure and function of muscular tissue:			
		Describe the microscopic structure of a skeletal muscle fibre and how muscles contract			
		Describe and explain the structural and physiological differences between fast and slow twitch muscle fibres and their relevance in sport.			
	Nerve tissue	Understand the structure and function of nervous tissue:			
		Describe the structure and function of non-myelinated and myelinated neurones			
		Describe and explain the conduction of a nerve impulse (action potential) along an axon, including changes in membrane permeability to sodium and potassium ions and the role of the myelination in saltatory conduction			
		Interpret graphical displays of a nerve impulse and EEG recordings			
		Describe synaptic structure and the role of neurotransmitters, including acetylcholine			
		Explain how imbalances in certain, naturally occurring brain chemicals can contribute to ill health, including dopamine in Parkinson's disease and serotonin in depression			
		Describe and explain the effects of drugs on synaptic transmission, including the use of L-Dopa in the treatment of Parkinson's disease.			

Chemistry			Now	After lesson	After revision
Structure and bonding in applications in science	Electronic structure	Understand the electronic structure of atoms			
		Explain the arrangement of electrons in electronic orbitals			
		Describe the Aufbau principle			
		Describe Bohr's theory			
	Ionic bonding	Understand ionic bonding:			
		Describe the strong electrostatic attraction between oppositely charged ions			
		Explain the effects ionic radius and ionic charge have on the strength of ionic bonding			
		Explain how ions form in terms of electron loss or gain			
		Recognise and draw electronic configuration diagrams of cations and anions.			
		Understand covalent bonding:			
		Describe the strong electrostatic attraction between two nuclei and the shared pair(s) of electrons between them			
		Draw and interpret dot and cross diagrams to show electrons in simple covalent molecules, including those with multiple bonds and dative covalent (coordinate) bonds			
		Describe the relationship between bond lengths and bond strengths in covalent bonds			
		Explain the tetrahedral basis of organic chemistry.			
	Metallic bonding	Understand metallic bonding:			
		Explain the properties of metals caused by de-localised electrons			
		Explain the properties of metals caused by positive metal ions			
		Explain the properties of metals caused by regular layer structure.			
	Intermolecular forces	Understand the following intermolecular forces:			
		Describe and explain van der Waals forces			
		Describe and explain dipole-dipole forces			
		Describe and explain hydrogen bonding			
	Calculating quantities	Understand the following:			
		Interpret and construct balanced equations			
		Calculate and explain relative atomic mass			
		Describe atomic number and relative molecular mass			
		Calculate and interpret moles, molar masses and molarities			
		Understand the quantities used in chemical reactions:			
		Calculate using mass, volume of solution, concentration			
		Calculate and interpret reacting quantities			
		Calculate and interpret percentage yields			

			Now	After lesson	After revision
Production and uses of substances in relation to properties	**Periodic table**	Understand the periodic table:			
		Describe the elements in periods 1, 2, 3 and 4			
		Recognise and explain the atomic structure of elements in groups – s block, p block, d block			
		Explain the layout of periodic table in relation to s, p, d notation			
		Recognise and state electronic arrangement of elements using s, p, d notation			
	Physical properties related to atomic structure	Understand the physical properties of elements:			
		Describe what is meant by first ionisation energy			
		Explain the reasons for trends in ionisation energy across Periods 2–4 and down Groups 1, 2 and 7			
		Describe what is meant by electron affinity and explain differences between elements			
		Describe what is meant by atomic radius and explain differences between elements			
		Describe what is meant by ionic radius and explain differences between elements			
		Describe what is meant by electronegativity and explain differences between elements			
		Describe the type of bonding in different elements and explain differences			
		Describe the trends in melting point and boiling point across the periods			
		Describe and explain physical properties of metals – electrical conductivity, thermal conductivity, malleability, ductility			
	Chemical properties related to atomic structure	Understand the chemical properties of elements:			
		Describe and explain the products and reactivity of all period 2 and 3 elements with oxygen			
		Describe and explain the products and reactivity of metals with oxygen, water, dilute hydrochloric acid and dilute sulfuric acid			
		Describe the position of metals in the reactivity series in relation to position in the periodic table			
		Describe and explain what is meant by oxidation and reduction			
		Describe and explain variable oxidation states of transition metal ions			
		Describe displacement reactions of metals/halogens			
		Describe and explain the uses and applications of substances produced within this unit.			

Physics			Now	Revisit 1	Revisit 2
Working with waves		Understand the features common to all waves; use and define the following terms as applied to waves:			
		periodic time			
		speed			
		wavelength			
		frequency			
		amplitude			
		oscillation			
		Interpret and make calculations using features and values from graphical representation of wave features.			
		Understand the difference between the two main types of wave:			
		Describe transverse waves in terms of the direction of vibration and energy transfer and recognise their features			
		Describe longitudinal waves in terms of the direction of vibration and energy transfer and recognise their features			
		Describe and explain the use of diffraction gratings:			
		Explain what is meant by displacement			
		Explain what is meant by coherence			
		Explain what is meant by path difference			
		Explain what is meant by phase difference			
		Explain what is meant by superposition			
		Understand the industrial application of diffraction gratings to include emission spectra and identifying gases.			
		Be able to use the wave equation wave speed = frequency x wavelength $v = f\lambda$			
		Understand the concept and applications of stationary waves resonance			
		Explain how stationary waves are formed			
		Describe nodes and anti-nodes			
		Explain how musical instruments use stationary waves and draw and recognise fundamental frequencies and harmonics for tubes open at both ends and one end only			
		Be able to use the equation Wave speed = √(Tension/ μ) where μ = mass/length of string $v = \sqrt{(T/\mu)}$			
	Waves in communication	Understand the principles of fibre optics:			
		refractive index $n = c/v = \sin i / \sin r$			
		total internal reflection			
		calculation of critical angles at a glass–air interface: $\sin C = 1/n$ where C is the critical angle			
		Understand the applications of fibre optics in medicine to include endoscopes.			
		Understand the applications of fibre optics in communication to include:			
		Describe the difference between analogue and digital signals			

Physics			**Now**	**Revisit 1**	**Revisit 2**
		Describe how to convert analogue to digital signals			
		Explain which part of the electromagnetic spectrum is used in broadband			
		Use of electromagnetic waves in communication			
		Understand that all electromagnetic waves travel with the same speed in a vacuum.			
		Be able to use the inverse square law in relation to the intensity of a wave: Intensity = a constant / (distance from source)^2 $I = k / r^2$			
		Understand how the regions of the electromagnetic spectrum are grouped according to the frequency.			
		Understand how the applications of electromagnetic waves in communications are related to frequency			
		Know the frequency range of electromagnetic radiation used for satellite communication			
		Know the frequency range of electromagnetic radiation mobile phones			
		Know the frequency range of electromagnetic radiation used for Bluetooth®			
		Know the frequency range of electromagnetic radiation used for infrared			
		Know the frequency range of electromagnetic radiation used for wi-fi.			
		Compare different ranges of electromagnetic radiation and explain why they are suitable for their use			

Glossary

Command verb	Explanation of what you have to do
Analyse	Explore the main ideas of the subject. Explain the importance of each idea and how they are related.
Assess	Give your judgement on the importance of something.
Compare/Contrast	Explain the similarities and the differences between the two or more subject matters.
Conclude	After having written about a topic give a reasoned judgement stating what your overall opinion is.
Critically analyse	Give your opinion of the subject of interest – consider all of the evidence and then write about both the advantages and disadvantages
Demonstrate	Give a number of related examples or details from a variety of sources to support the argument you are making. In a practical situation, this means that you must practically carry out the activity/skill while being observed
Describe	**Give a detailed account of something**
Discuss	Examine the advantages and disadvantages of the subject of interest and then try to complete the discussion with a conclusion.
Distinguish	Explain the differences
Evaluate	Give evidence to support the good and bad points of the topic and then give your opinion based upon the evidence.
Examine	Inspect something closely
Explain	**Give a detailed account to give the meaning of something with reasons. Include the 'how' and 'why' of the topic of interest**
Identify	Point out (choose the right one), give a list of the main features.
Illustrate	This usually means that you should draw or use images to help answer the question.
Interpret	Explain the meaning of something by giving examples, diagrams and/or opinions
Justify	Give supported reasons for your view to explain how you have arrived at these conclusions
List	Bullet points of information or a record that includes an item-by-item account of relevant information
Outline	A brief description of something that really only looks at the main topic or item

The most common BTEC verbs are

PASS – describe

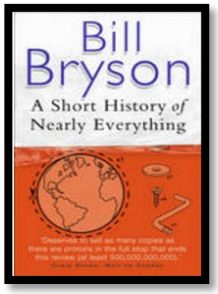
MERIT - explain

DISTINCTION - analyse.

Additional Reading

Below is a selection of books that should appeal to a scientist looking for science in everyday life!

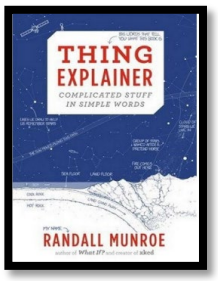
1. **A Short History of Nearly Everything**



ISBN – 0552997048 - A modern classic. Popular science writing at its best. A Short History of Nearly Everything Bill Bryson's quest to find out everything that has happened from the Big Bang to the rise of civilization - how we got from there, being nothing at all, to here, being us. Hopefully by reading it you will gain an awe-inspiring feeling of how everything in the universe is connected by some fundamental laws.

https://www.waterstones.com/books/search/term/a+short+history+of+nearly+everything

2. **Thing Explainer: Complicated Stuff in Simple Words**



ISBN – 1408802384 - This final recommendation is a bit of a wild-card – a book of illustrated cartoon diagrams that should appeal to the scientific side of everyone. Written by the creator of online comic XTCD (a great source of science humour) is a book of blueprints from everyday objects such as a biro to the Saturn V rocket and an atom bomb, each one meticulously explained BUT only with the most common 1000 words in the English Language. This would be an excellent coffee table book in the home of every scientist.

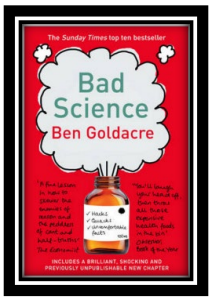
https://www.waterstones.com/book/thing-explainer/randall-munroe/9781473620919

3. **The Science of Everyday Life: Why Teapots Dribble, Toast Burns and Light Bulbs Shine (Hardback) Marty Jopson**

ISBN-10: 1782434186 http://bit.ly/pixlchembook2

The title says it all really, lots of interesting stuff about the things around you home!

4. **Bad Science (Paperback) Ben Goldacre**



ISBN-10: 000728487X http://bit.ly/pixlchembook3

Here Ben Goldacre takes apart anyone who published bad / misleading or dodgy science – this book will make you think about everything the advertising industry tries to sell you by making it sound 'sciency'.

Online Clips / Series

1. **Shock and Awe, The Story of Electricity –** A 3 part BBC documentary that is essential viewing if you want to see how our lives have been transformed by the ideas of a few great scientists a little over 100 years ago. The link below takes you to a stream of all three parts joined together but it is best watched in hourly instalments. Don't forget to boo when you see Edison. (alternatively watch any Horizon documentary – loads of choice on Netflix and the I-Player)

   https://www.youtube.com/watch?v=Gtp51eZkwoI

2. **NASA TV –** Online coverage of launches, missions, testing and the ISS. Plenty of clips and links to explore to find out more about applications of Physics in Space technology.

   http://www.nasa.gov/multimedia/nasatv/

Online Journals/Podcasts

1. https://www.livescience.com/ - For the science geek in everyone, Live Science breaks down the stories behind the most interesting news and photos on the Internet, while also digging up fascinating discoveries that hit on a broad range of fields, from dinosaurs and archaeology to wacky physics and astronomy to health and human behavior. If you want to learn something interesting every day, Live Science is the place for you.

2. https://www.nursingtimes.net/careers/your-nursing-career/listen-to-the-navigating-nursing-podcast-03-03-2022/ - for those considering a career in nursing or similar caring profession. You will hear from nurses working across all fields and in a variety of jobs, discussing their current roles, educational achievements and their careers to date – while sharing their plans for the future.

3. https://open.spotify.com/show/6GMjF5TBywEJ2jdkkWY4Tf - The College of Paramedics presents a new series of podcasts bringing news, interviews, discussion and up to date analysis from around the world of paramedic practice.

4. https://engineeringmatters.reby.media/ - Engineering Matters celebrates the work of engineers who use ingenuity, practicality, science, theory and determination to build a better world.

Additional Reading Log:

Additional Reading Title	Dates?	Points of interest	How does it link to the course?

Supporting Resources

Khan Academy
A much-loved resource for a multitude of subjects, Khan Academy offers detailed insight into a whole host of science topics as well as providing free access to articles, exercises, and videos for you to browse through.
Although they don't offer exam board specific resources, Khan Academy offers students a comprehensive guide to the fundamentals of biology that form part of your Applied Science course.

https://www.khanacademy.org/

Get Revising
Get Revising offers a series of revision tools including downloadable revision guides, and study planners. Use this site to find everything from past papers and insightful mind maps to downloadable documents, presentations and revision notes. As notes are uploaded by past and current students, be sure to look out for teacher recommended resources and positive teacher comments to ensure you are learning from the correct information.

https://getrevising.co.uk/

S-cool
S-cool is a free provider of educational resources. Simply select your level of study and area you want to focus on and S-Cool will present you with a topic breakdown for you to scroll through and take notes from. For additional learning resources, like past papers and revision summaries, S-cool does require you to sign up but don't worry, it's totally free!

https://www.s-cool.co.uk/

Physics & Maths Tutor
Despite the name this site has tons of excellent resources and allows you to get straight to the materials that matter to you.

shorturl.at/kmsuL