Welcome to Level 3 Applied Science!

You've probably been wondering how studying at college will compare to your previous studies so we have put together a quick guide and some activities to help you get ready for starting in September.

Pearson BTEC Level 3 National Extended Diploma in Applied Science

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Serving the community through education and training

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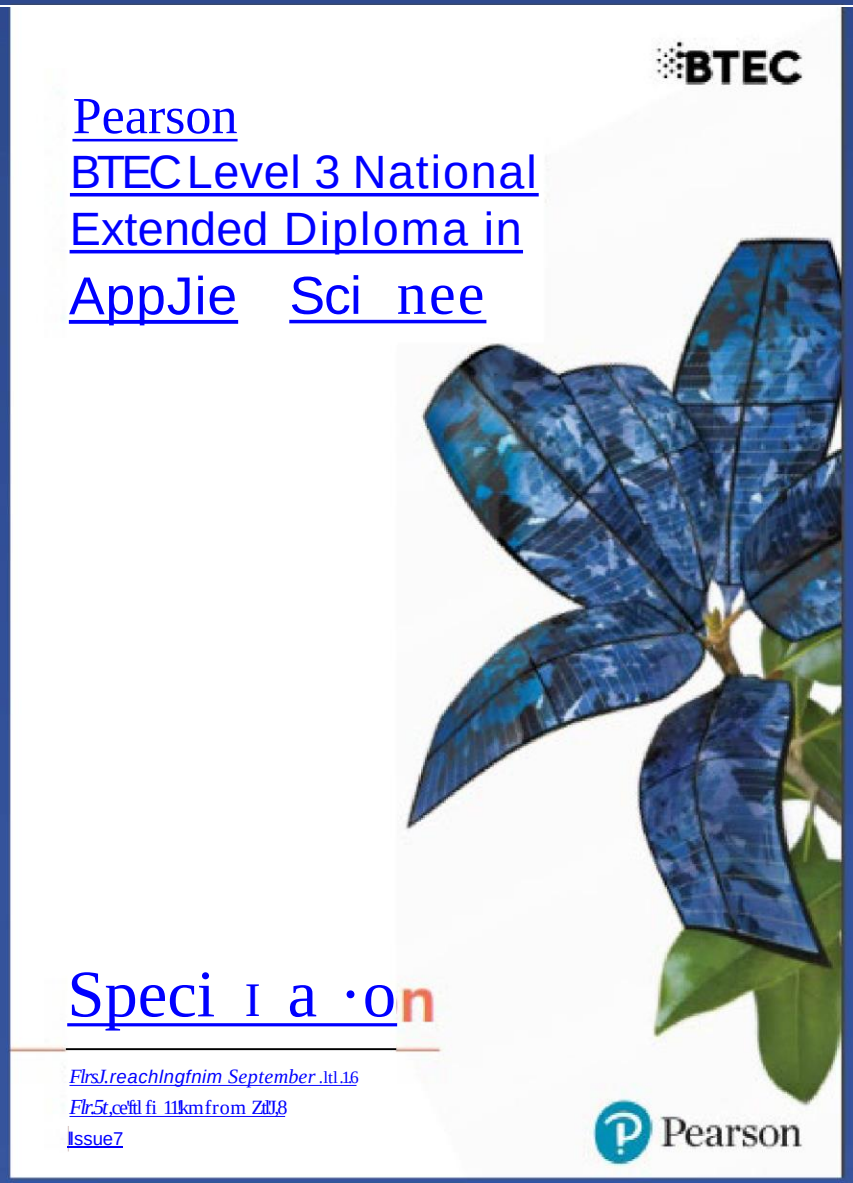
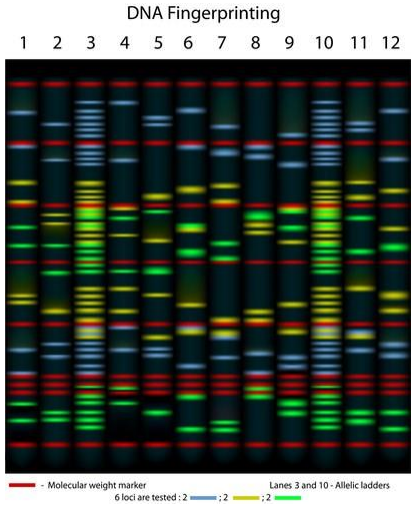


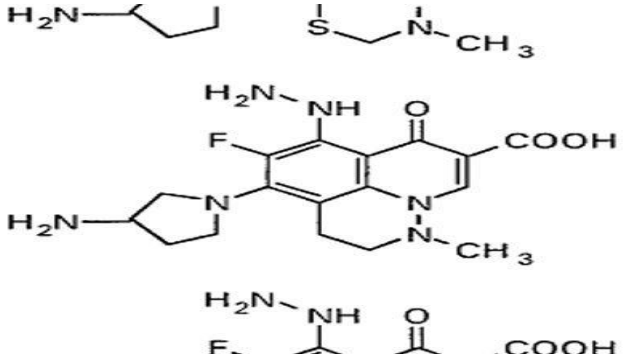
Serving the community through education and training

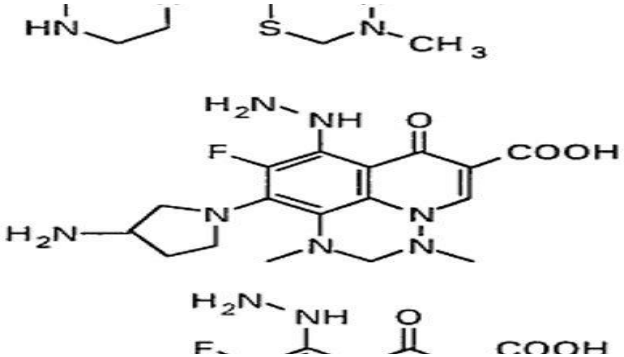


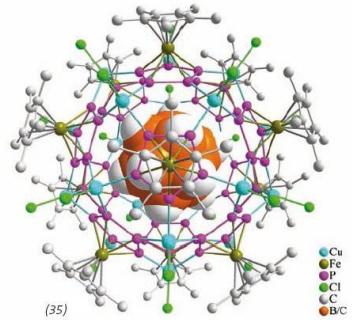
Year 1

Topics studied:

- ✓ Principles & Applications of Science I
- ✓ Practical Scientific Procedures & Techniques
- ✓ Scientific Investigation Skills
- ✓ Forensic Investigation Procedure in Practice
- ✓ Forensic Traffic Collision Investigation
- ✓ Microbiology & Microbiological Techniques
- ✓ Physiology of the Human Body







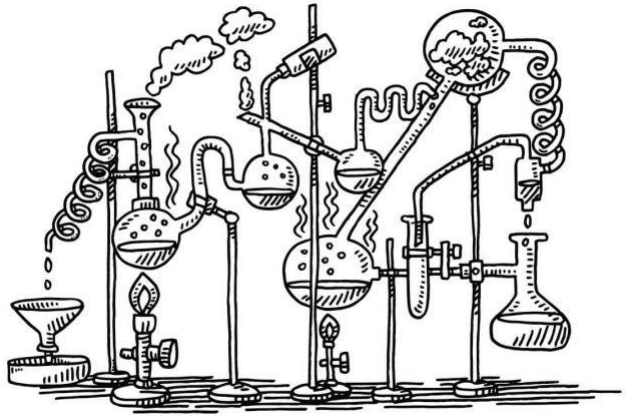
Year 2

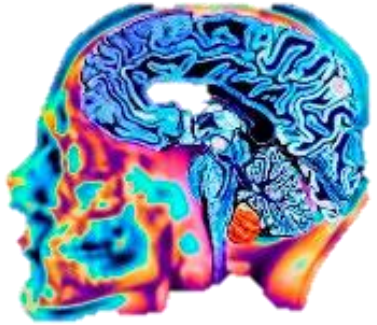
Topics studied:

- ✓ Principles & Applications of Science II
- ✓ Investigative Project
- ✓ Contemporary Issues in Science

Along with (these are subject to change)

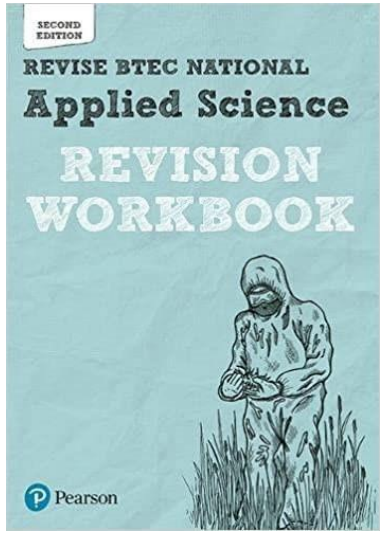
- ✓ Application of Inorganic Chemistry
- ✓ Application of Organic Chemistry
- ✓ Medical Physics
- ✓ Electrical Circuits and Their Applications

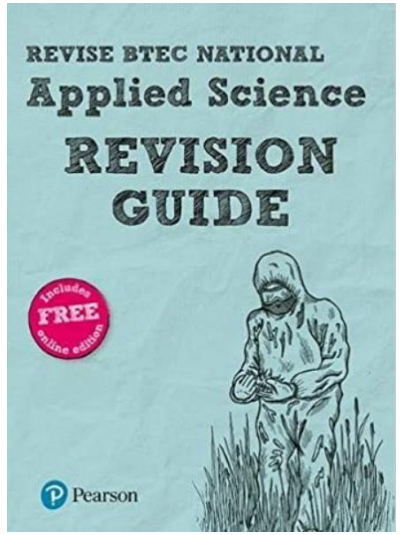


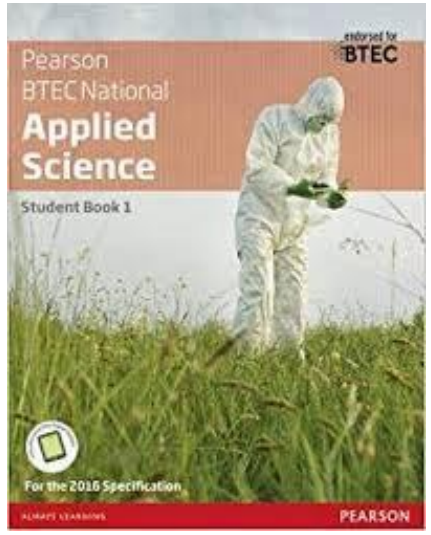


Useful resources

- ***Useful textbooks***







- ***Useful websites***

https://qualifications.pearson.com/en/qualifications/btec-nationals/applied-science-2016.html

http://www.chemguide.co.uk/

https://www.bbc.co.uk/bitesize

Preparation for college

What equipment do I need?

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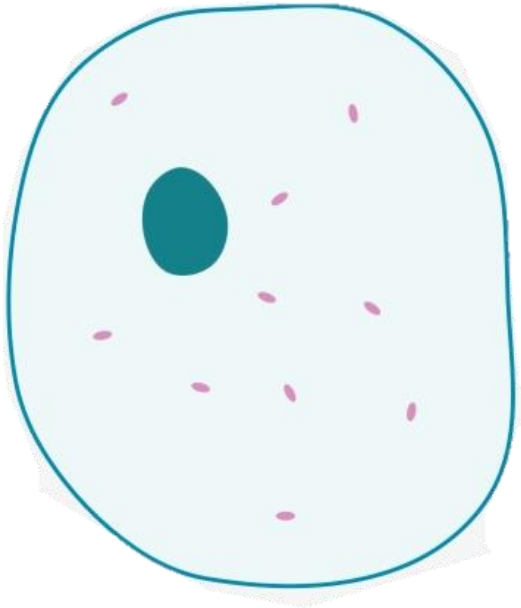
Biology

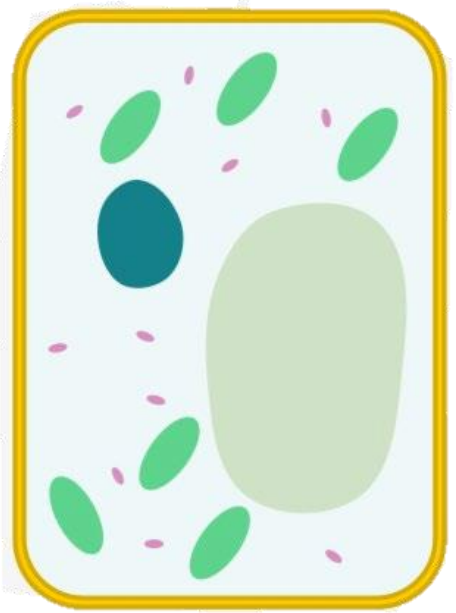
What do you know from GCSE?

Can you draw a simple animal or plant cell?

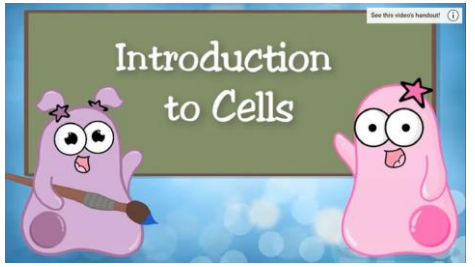
If so it would most likely look like the cells below…..



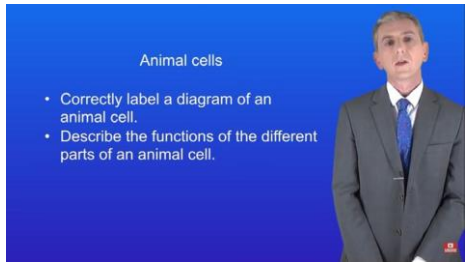
Can you label the simple components of an animal cell?

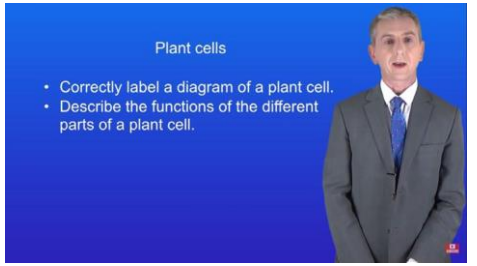


Can you label the simple components of a plant cell?



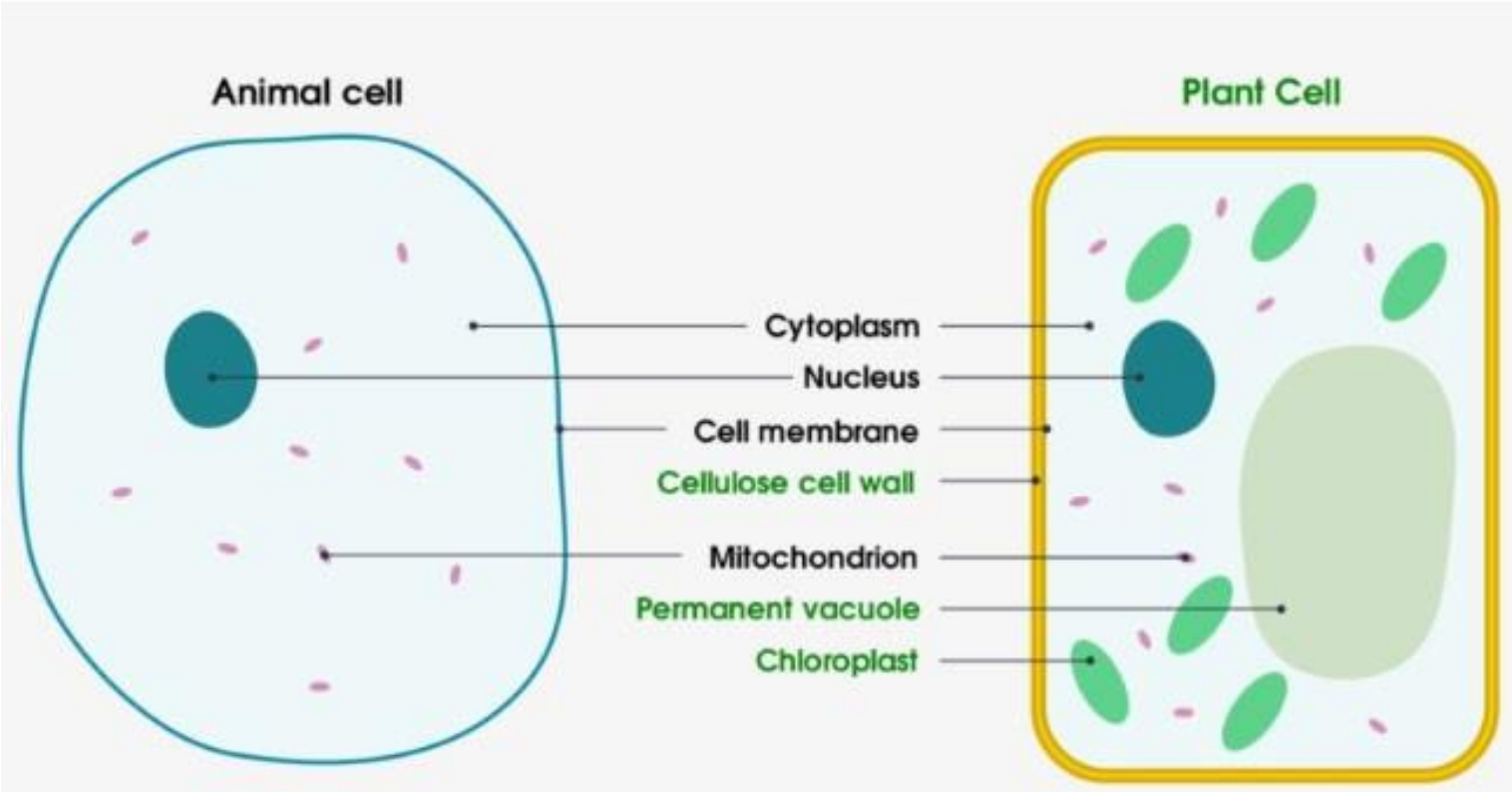
You may have watched videos like the one above or those below during high school, to help learn basic cell organelles. Click on each for a reminder and label the cells to the left





What do you know from GCSE?

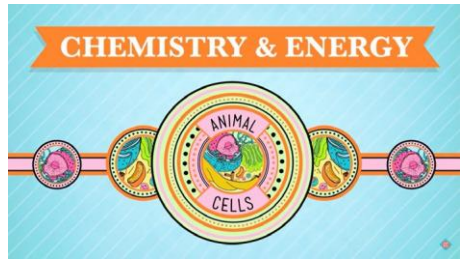
If you labelled the cells correctly, you should have come up with answers such as these:



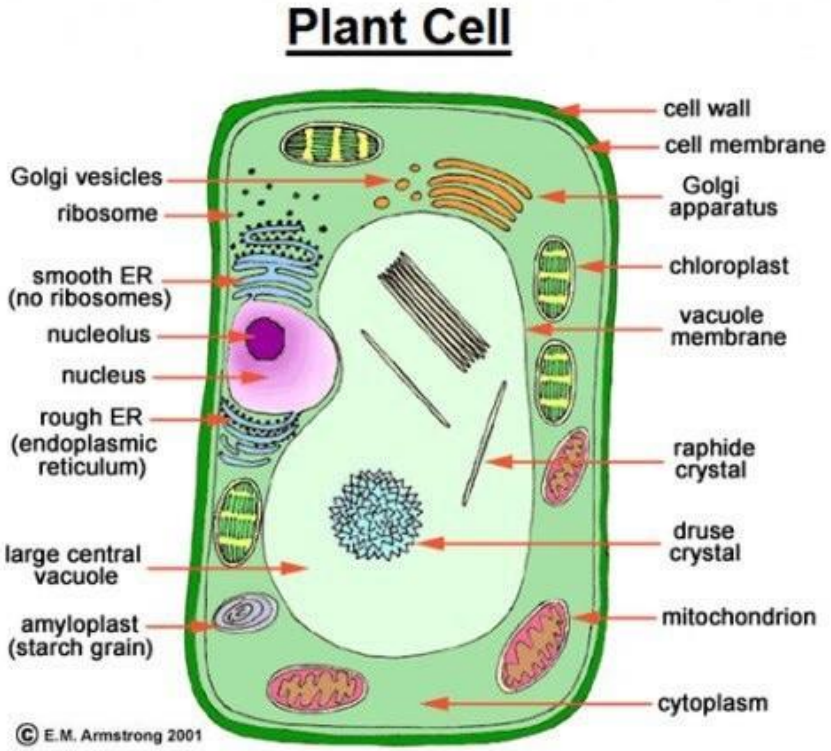
Watch the videos above and below. Then draw and label these new organelles onto your original diagram.

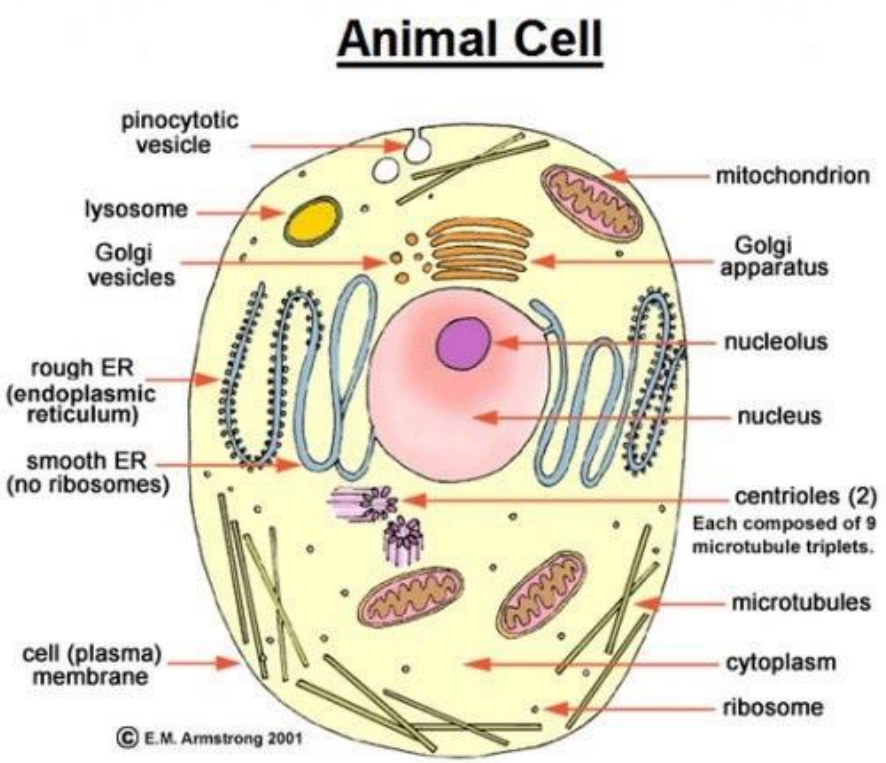
Above is very specific and informative.

Below, are a little more 'fun' with correct information also



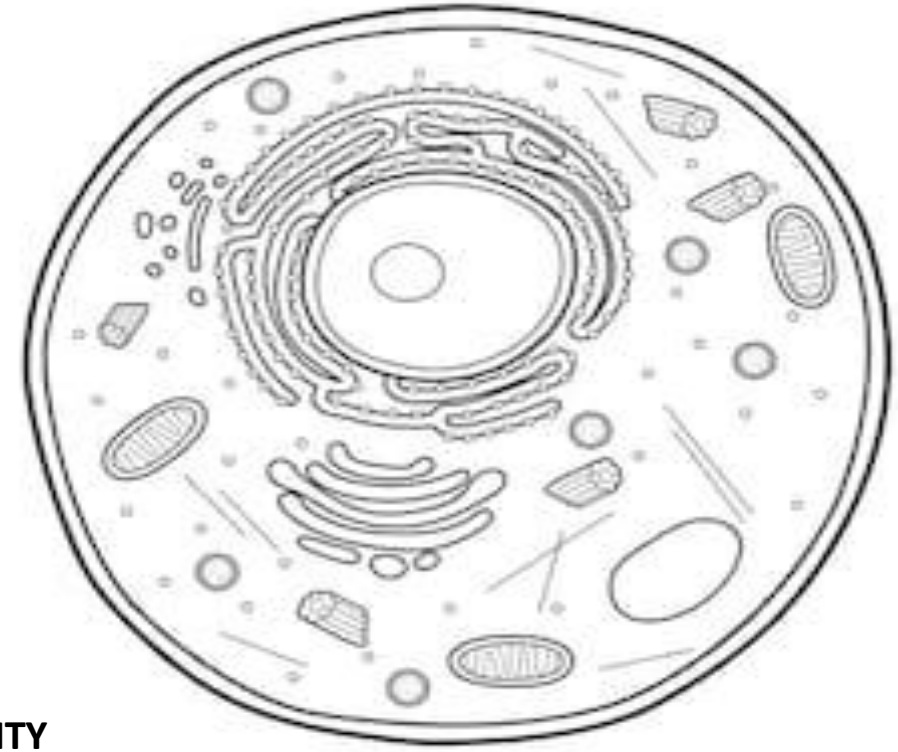
Biology in Vocational Science

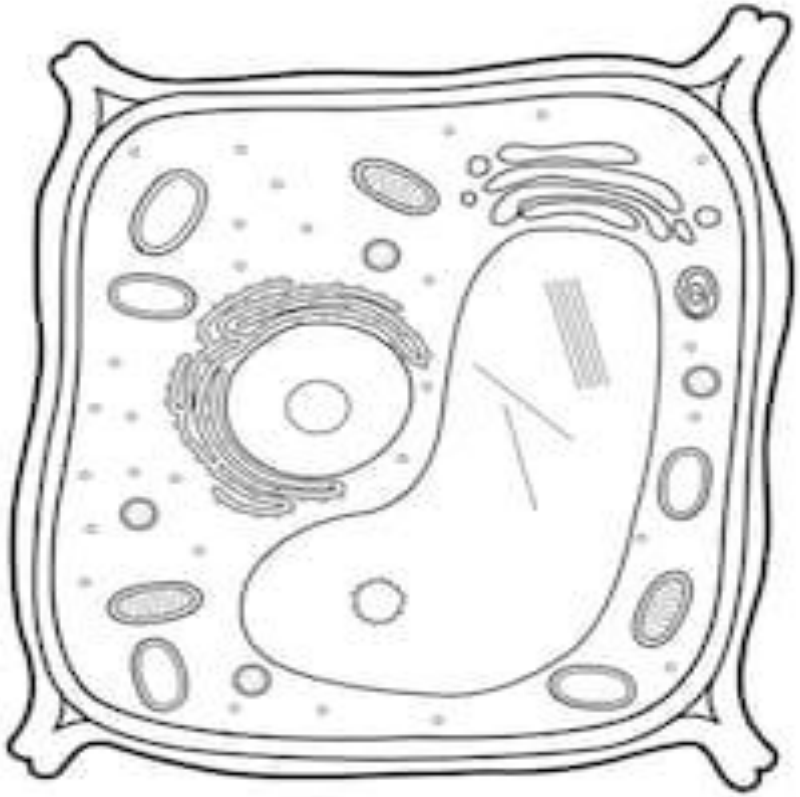




For many topics, we will take what you have learnt in GCSE, consolidate that theory and then build on it with more detail. In this topic for example, you learn about many more organelles in plant and animal cells, as well as their functions.

Have a go for fun – from memory.
How many of these organelles can you label?



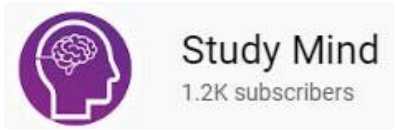


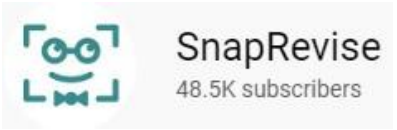
EXTENSION ACTIVITY

Can you describe their function also?

Useful links and videos

There are lots of useful videos on YouTube to help consolidate your learning in Level 3 Biology. Below are just some of the YouTube users who regularly upload specific Biology videos:





We often use videos in Biology to ‘flip learning’.

If you have a YouTube account, it may be useful to subscribe to their pages in advance, so you can watch the relevant videos prior to learning the new content

So, what can you do in preparation for college?

In the first year of Biology, you will learn about;

- Cells (animal, plant, bacterial, viral) and Tissue (epithelial, nervous, etc)
- The Nervous System (reflexes, neurones, synapses)
- Muscles (different types, how they work)
- Microbiology (organisms that cause disease, how to treat them)
- Anatomy and Physiology (Musculoskeletal, Lymphatic, Digestive)
- And much much more…….

Read ahead. Gain confidence. Enjoy Biology

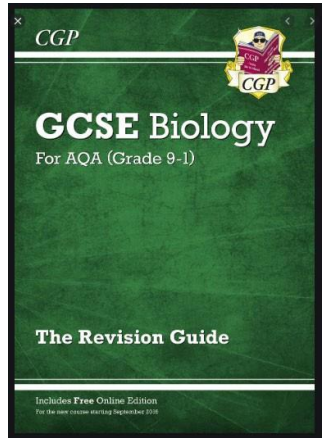
Make sure you are confident coming to college with the content learnt during your GCSE years.

Biology at college builds on this content. Many of the topics you will have already learnt. We just add to it in more detail.

There are many new topics also though, so a solid understanding is vital to succeed

Use your high school notes and read ahead over the summer.

You may also wish to invest in a GCSE revision guide to help with this.



Good Luck

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Chemistry

Why study chemistry?

Chemistry is everything and is everywhere, it allows us to explore and study the world we live in. It's in the food you eat, clothes you wear, water you drink, medicines, air, cleaners. You name it!

Studying Chemistry in Applied science helps you to develop research, problem solving and analytical skills. It allows you to challenge ideas through logic and step-by-step reasoning. By studying Applied science (chemistry) at Bury College you will develop teamwork and communication skills in a laboratory setting.

This means you should be well prepared for every single lesson!

Career paths you can go into include:
Zoology
Engineering,
Biomedicine
Pharmacology
Allied Health professional

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Here are some things you should ideally already know and what you will learn.

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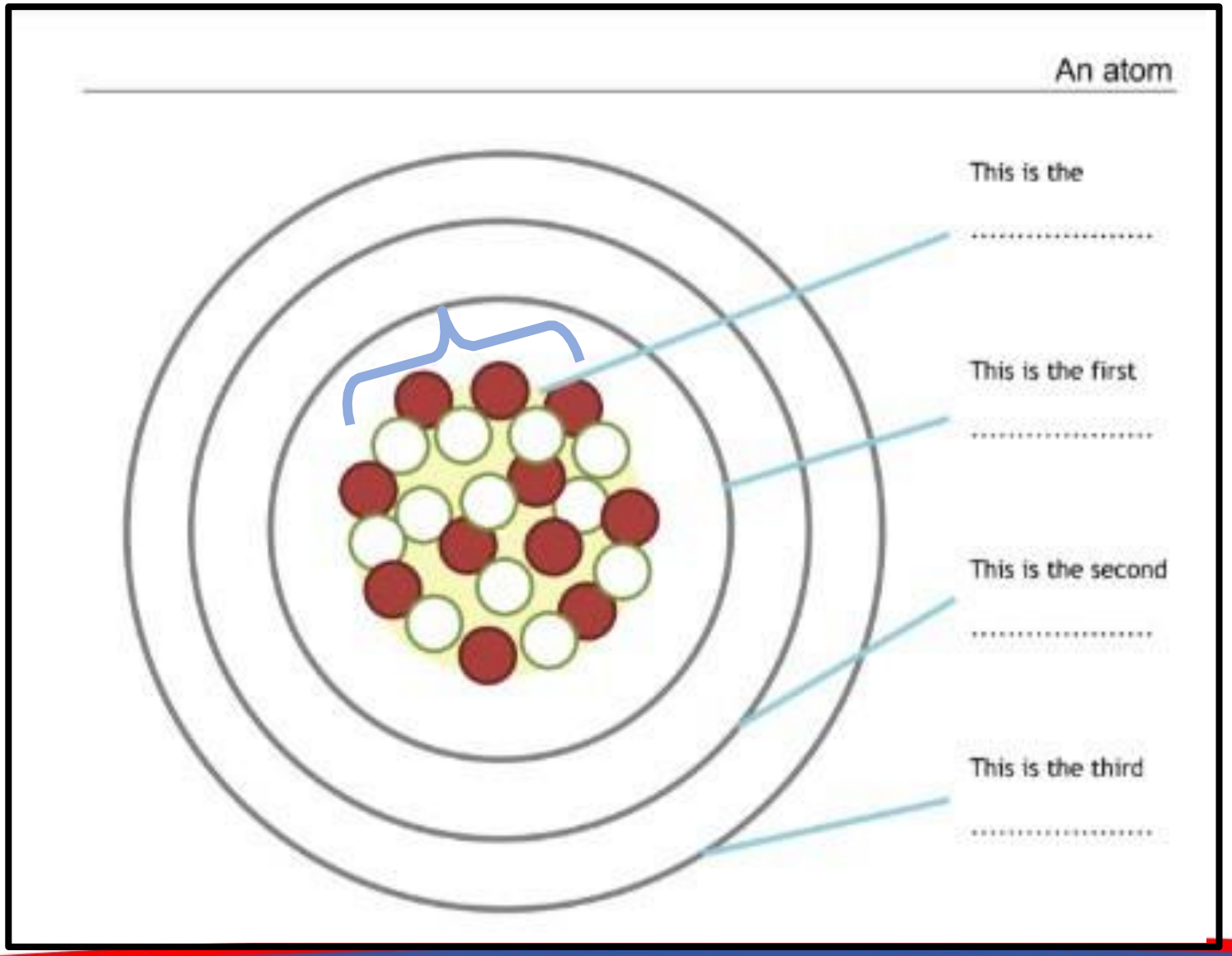
I already know....	I will learn....
Simple model of the atom	Atoms are made up sub atomic particles
Properties of metals and non-metals	Explain differences between metals and non –metals in terms of atomic structure and bonding
Difference between atoms, elements & compounds	Explain atoms are bonded to each other elements and compounds
How to represent chemical reactions using formulae and equations	Carry out reacting masses from balance symbol equations
How to use chemical symbols and formulae to represent elements and compounds	Knowing the structure of atoms and type of bonding involved
The conservation of mass in chemical reactions	Carry out mole calculations from balanced symbol equations

Can you complete following? Part a



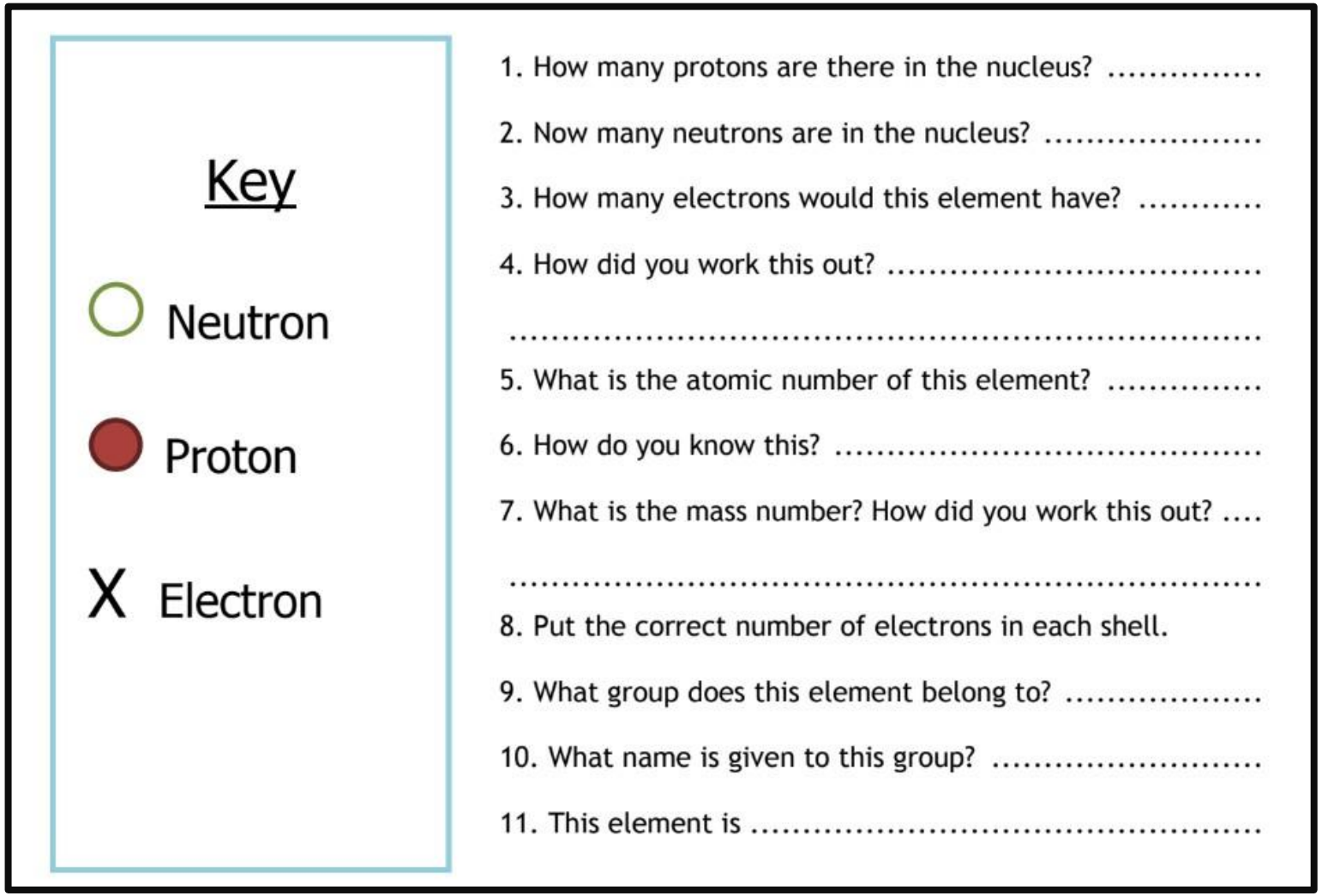
Key

Neutron

Proton

X Electron

Can you find out the name of the element?
(You will need a periodic table)
Part b



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Physics

Waves

Waves and the Electromagnetic spectrum is something that you will have studied for your GCSE Science. We will recap this topic and build upon it during your first term at Bury, and it will form a large part of your first exam in January.

This short workbook is intended to ensure you are confident with the content covered at GCSE, which is needed for the new topics introduced on the Physics part of the BTEC Applied Science course.

Checklist of GCSE Topics you should be familiar with.

- Properties of waves (including any equations) ☐
- Transverse and longitudinal waves (with examples of each) ☐
- Reflection and refraction of waves ☐
- Use of waves for detection e.g. ultrasound and P-waves/S-waves ☐
- The electromagnetic (EM) spectrum ☐
- Black body radiation ☐

Tick off the topics you feel confident with. Use your GCSE notes/revision guide to go over any areas you are unsure about.

Useful videos:

Here are some links to videos which you might find useful if you need to recap any of the topics in the checklist above (the videos are all short: under 10 mins):

- https://www.youtube.com/watch?v=aCu4VRKMstA – Covers the basics on wave properties, and longitudinal and transverse waves
- https://www.youtube.com/watch?v=7v2gs8rdQzU – Covers the EM spectrum
- https://www.youtube.com/watch?v=h4jvZ_zHKYY&list=RDCMUCaGEe4KXZrjou9kQx6ezG2w&index=3 – Covers P-waves and S-Waves
- https://www.youtube.com/watch?v=KnIualWf6Rs&list=RDCMUCaGEe4KXZrjou9kQx6ezG2w&index=4 – Covers visible light and colour
- https://www.youtube.com/watch?v=s9wZkP64rAc – Covers sound waves and hearing
- https://www.youtube.com/watch?v=WDBtOeXUdWQ – Covers reflection
- https://www.youtube.com/watch?v=UUc44Vg5pCI – Covers refraction

- (BBC Bitesize is also a great resource for recapping topics!)

Tasks

Complete these questions to recap/consolidate what you have previously covered at GCSE (topics are mentioned in the checklist above).

1. a) Draw a diagram of a wave and label:

   i) Amplitude
   ii) Wavelength

   b) Explain what is meant by:
   i) frequency
   ii) time period

2.a) What are the differences between longitudinal and transverse waves?

b) Give an example of a longitudinal and transverse wave

3. a) What is the equation for wave speed?

b) What is the speed of a wave travelling with a frequency of 10Hz and with a wavelength of 2m

c) What is the frequency of a wave travelling at 100m/s and with a wavelength of 50cm

4. What does the colour of green plants suggest about what light is reflected from them, and what light is absorbed?

5. a) What are P-waves and S-waves?

   b) P-waves and S-waves have been used to provide evidence about the structure on the earth. Explain why they were used for this

   (*Hint: draw a diagram of the earth's structure, and the path of the waves to help…*)

6.a) Label a diagram of the electromagnetic spectrum, starting with the shortest wavelength and going to the longest.

b) Write one use of each type of wave on the electromagnetic spectrum

7. Write a sentence and draw a diagram to explain:
   a) What is meant by reflection?
   b) What is meant by refraction