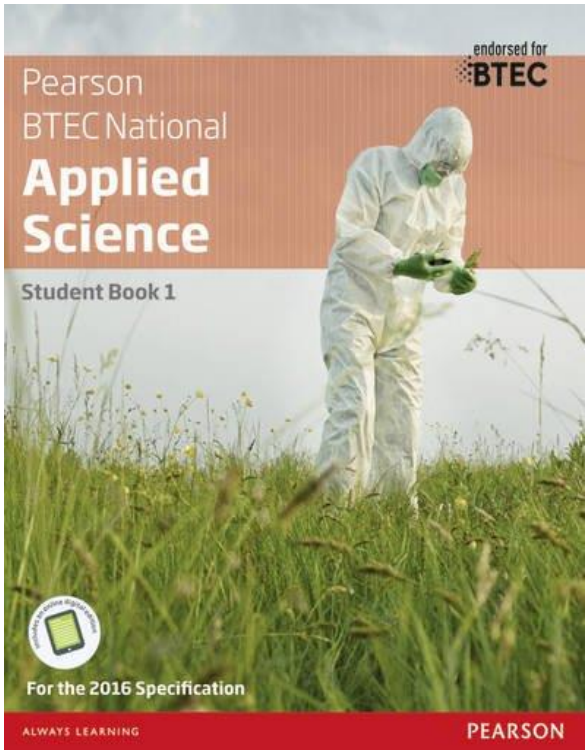
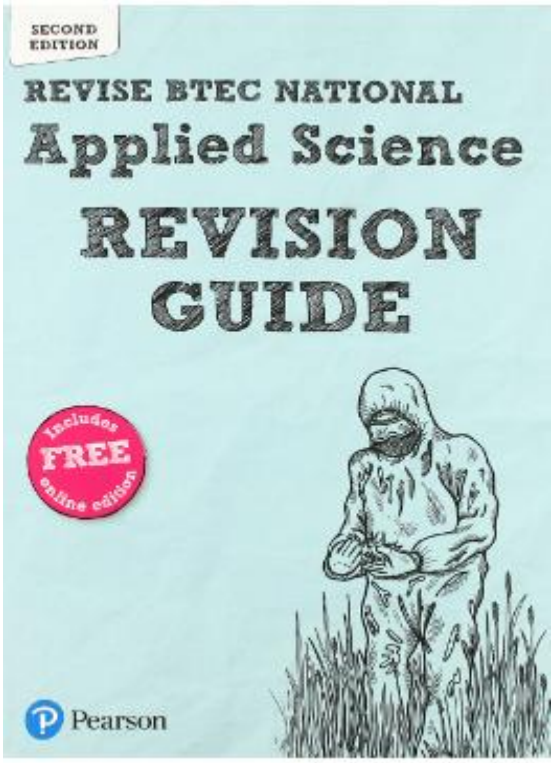
Wigston College

Level 3

National Certificate in Applied Science





Books useful for the course. Revision guide strongly recommended for use over the 2 years.

Transition Pack 2023/24

Welcome

We are glad that you have chosen to study BTEC Level 3 National in Applied Science at Wigston College.

You will be completing the Certificate in year 12 which includes two mandatory units, one externally assessed exam and one internally assessed unit of assignments. Learners must complete and achieve at pass grade or above for both these units to gain a BTEC qualification.

These units are:

Unit 1- Principles and Applications of Science (Examined 50%);

Unit 2- Practical Scientific Procedures and Techniques (Assignment based, internally assessed 50%).

On the BTEC course, your work will be assessed to one of five levels:

U- Unclassified (no qualification awarded)

P - Pass (equivalent to E at AS-level)

M - Merit (equivalent to C at AS-level)

D - Distinction (equivalent to A at AS-level)

D*- Distinction*(equivalent to A* at AS-level)

You can continue this course into Year 13 for the Extended Certificate which is equivalent in content and UCAS points to an A-Level.

You will receive regular feedback and support from your teachers during the internally assessed assignment. The external exam needs to be at least a 'Pass' to gain a qualification. The exam will be taken in January 2024.

How do I succeed in BTEC Applied Science?

Workload

At first, you will notice the difference in work load compared to year 11. You will need to take notes in class and read around the subject in your own time to support your learning. Make sure you ask for help if you feel you need it. Many people leave it too long before asking for help. At the start you need to recognise that Year 12 will take some getting used to.

Planning

You will be given deadlines for assignments and tasks. You have to meet deadlines so make sure you plan for them in your study schedule. For each hour you have in class, you should spend at least another hour in personal study time, completing notes and writing up experiments. Your teacher will tell you what is coming up and you need to complete tasks for lessons so you maximise your time in the lab.

Practical work

As this is a vocational and practically based course, you will be completing a substantial amount of practical work in all areas. Most of this will be as part of your assignments or exam. Therefore, any tasks that are completed should be written up as notes.

Resources

It is strongly recommended that the course text book shown on the front cover is purchased and it is extremely helpful for both years of the course. A USB stick is a necessity to back up and keep your digital work safe.

Transition Tasks

Your knowledge of GCSE science (Chemistry, Biology and Physics!) will be essential to support your success at BTEC. **Research the following topics that have been covered at Key Stage 4 and make notes for use in the course.**

- Atomic bonding – Covalent and ionic
- Writing chemical formulae
- Animal and plant cells
- Waves (P2)

Now have a go at applying or researching scientific knowledge to answer these questions that have been taken from sample assessment material online.

1)

(a) Write the balanced equation for the reaction of aluminium in air to form aluminium oxide.

2 marks

(b) Draw dot-and-cross diagrams to show the arrangement of the outer electrons in the calcium ion and the two chloride ions in calcium chloride, $CaCl_2$.

2 marks

Show outer electrons only.

Most metals have high melting and boiling points.

The table shows the melting and boiling points of three metals: sodium, magnesium and potassium.

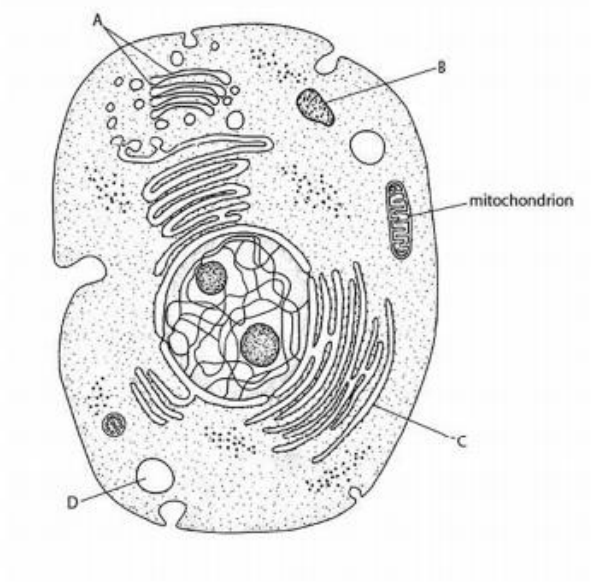
Metal	Group	Melting points/°C	Boiling points/°C
Sodium	1	97.72	883
Magnesium	2	650	1090
Potassium	1	63.38	759

(b) Discuss the different melting and boiling points of the three metals and the trends they show.

6 marks

3)

The diagram shows the ultrastructure of an animal cell.



(Source: http://m.everythingmaths.co.za/science/lifesciences/grade-10/02-the-basic-units-of life/images/5aaa292660adc2b15e6153c598f3ff07.jpg)

Find out what parts A, B, C and D are and their function in the cell:

A: _____

Role:_____

B:_____

Role:_____

C:_____

Role:_____

D:_____

Role:_____ (8marks)

4)

Heart disease caused by atherosclerosis is a major problem in the UK.

Smoking cigarettes and drinking alcohol are lifestyle factors that increase the risk of atherosclerosis.

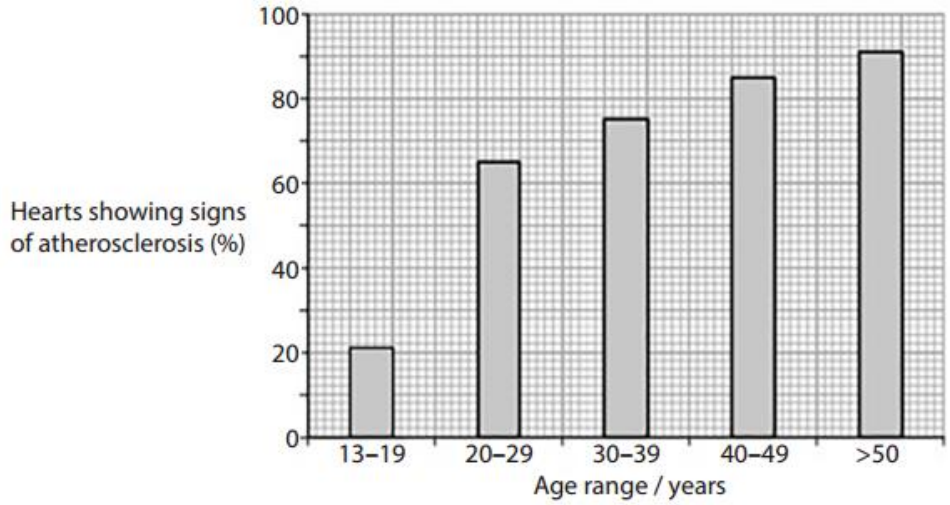
(a) State **one** other lifestyle factor that increases the risk of atherosclerosis.

1 mark

Many people in the UK need a heart transplant to replace their diseased heart.

A study of the hearts used in transplant operations from donors of different ages was carried out. The percentage of the donor hearts that showed signs of atherosclerosis was measured.

The graph shows the results.



The number of hearts donated by people between 20 and 29 years of age was 40.

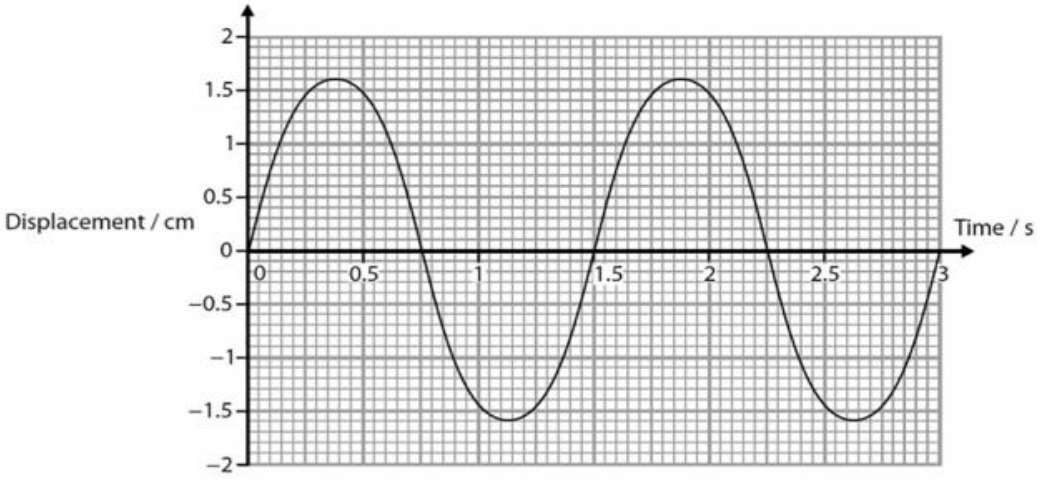
(b) (i) How many hearts showed signs of atherosclerosis for the age range 20–29 years.

1 mark

- ☐ **A** 14
- ☐ **B** 26
- ☐ **C** 40
- ☐ **D** 65

Oceanographers can understand the effects of coastal erosion by studying water waves in tanks. They collect information about the behaviour of a wave.

The graphs show two sets of information about the same water wave.



Use the graph to:

(a) Give the amplitude of the wave.

1 mark

Amplitude = ... cm

(c) Calculate the frequency of the wave.

3 marks

Show your working.

Frequency = ... Hz

6) Compare the use of mobile phones, Bluetooth® and Wi-Fi in communications.

Your answer should include reference to their uses, frequencies and range.

6 marks

Hand in all your tasks during the first lessons with your teacher. Completion of these tasks is required over the Summer holidays to show a commitment to your place on the BTEC Level 3 course.

MARK:

'I don't understand this yet.'

'I think I understand, but could not explain it to someone else.'

'I understand this well and could explain it to a friend.'

We look forward to seeing you in August.