Year 11 Raising Attainment Evening

What is Science at GCSE?

"Why do I need to do science?"

Science at GCSE level aims to develop students knowledge and understanding of scientific theories, but also their ability to apply that knowledge, analyse and evaluate information, in practical and everyday scenarios.

It gives students good life skills, regardless of the career path they follow.

Key Points

- Science GCSE grades are awarded on a 9–1 scale, with 9 being the highest grade awarded and 1 being the lowest grade awarded. This numerical grade is what you will see when students are given their results on results day.
- There is no coursework unit in the Science GCSEs
- Practical work is still a very important part of the course though, not only to consolidate learning, but also to develop skills in planning, analysing and evaluating.
- These practical skills will be assessed as part of the written examinations at the end of the course.

Content

There are two different pathways for Science at Southchurch High:

- The majority of students will sit **Combined Science** papers. This covers the full national curriculum, including all of the traditional topics in biology, chemistry and physics and counts as two GCSEs.

- Some students have opted to do **single sciences** (a.k.a. triple science) and will have extra lessons after school to cover the additional content required triple science. This counts as three GCSE grades

The Exams

- The final grades for each subject will be assessed through exam only.
- Students will be able to enter at a higher tier (grades 9-4) or a foundation tier (grades 5-1).
- For the Combined Science, students will sit six exam papers (two for each subject; physics, chemistry and biology). Exams are out of 70 marks and last 75 minutes each.
- For the single sciences, students will also sit six, slightly longer exams (two for each subject). Exams are out of 100 marks and last 105 minutes.

Grading

- For the single sciences, Physics, Chemistry and Biology you will now be graded from 9 to 1 instead of A* to G.
- Grade 9 will be reserved for only the very highest achievers (like an A**)
- For Combined Science you will receive a double grade e.g. 5-5, 5-4
- A good pass is now grade 5 or above.
- So what grade do you need in science?
  - Grade 4 to pass (and count towards your 5x A* - C grades)
  - Grade 5 for a good pass (lots of college course require 5x 5s)
  - Grade 6 to study A-level sciences
  - Grade 7 to study A-level science at a grammar school

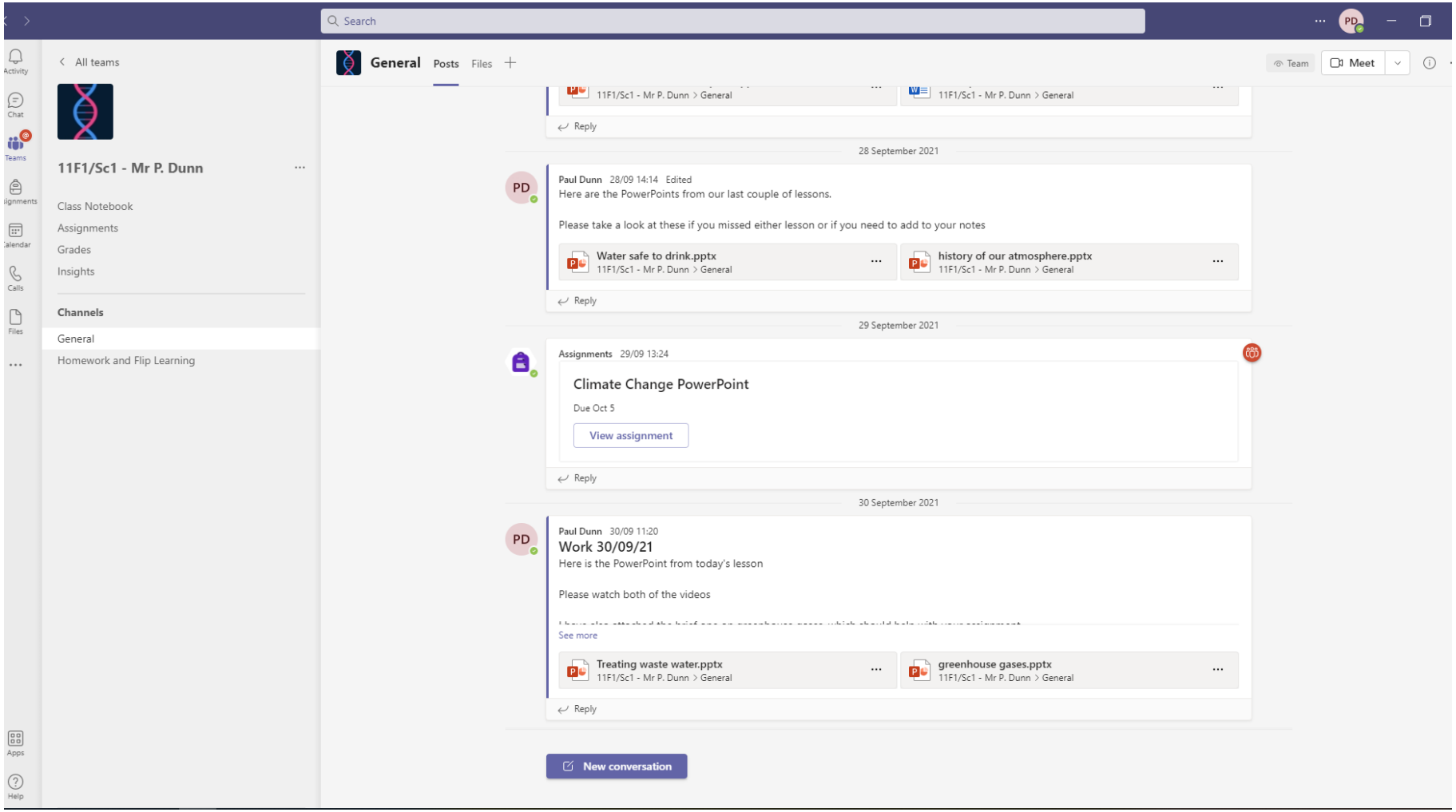
How Can Parents Support?

- It may feel overwhelming now that GCSEs are getting harder, especially if science 'isn't your subject'. How do you support your child?
- Don't give up! The Campaign for Learning found that parental involvement in a child's education can mean the difference between an 8 and a 9.
- Although your child may feel overwhelmed, over worked or demotivated at times, please try to stay positive. Try not to criticise, acknowledge their feelings and work towards a sensible solution together.

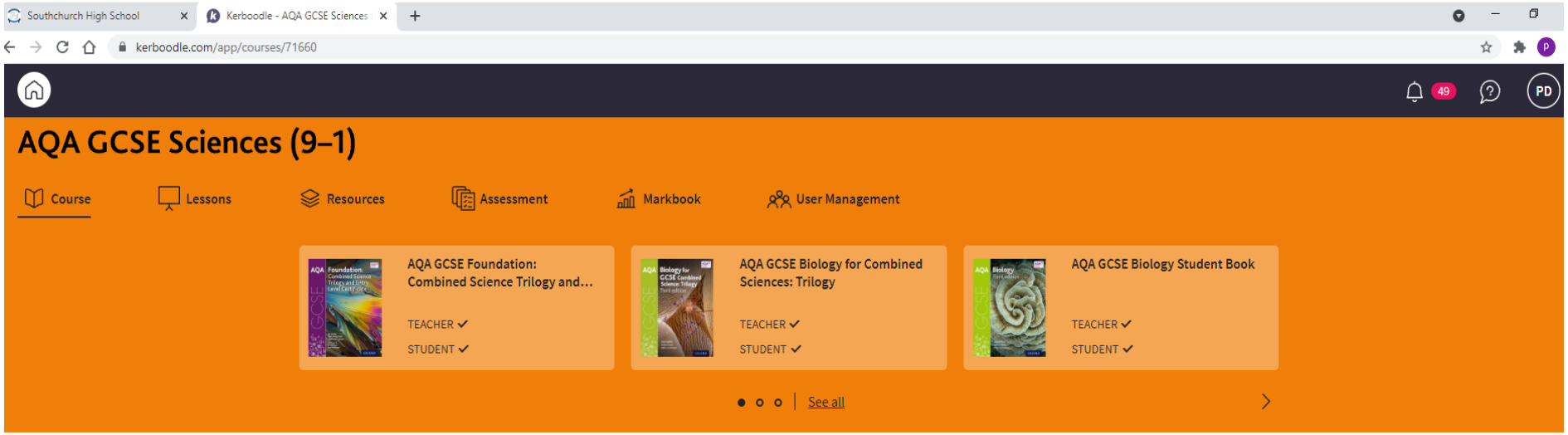
How Can Parents Support?

- **Work/Life balance.** Agree a schedule that provides a balance between work and social life and stick to it.
- **Be flexible**. If a special occasion arises, agree on another time to make up the work.
- **Be positive.** Recognise their successes and celebrate them. Use the 80/20 rule, if your child is sticking to the plan 80% of the time, they will be fine, try not to be too militant.
- **Show Interest.** You may have hated science at school, but if you can show an interest, maybe even learn something new with your child, your positive attitude will help them to enjoy their learning and hopefully motivate them to want to learn more.

Microsoft Teams



Kerboodle



Assignments

Due this week 0 Submitted 12 To mark 0

Welcome to AQA GCSE Sciences (9-1) Kerboodle

AQA GCSE Sciences (9–1) Kerboodle contains a bank of resources and assessments to support the latest AQA GCSE Biology, Chemistry, Physics, Combined Science: Trilogy, Combined Science: Synergy and Entry Level Certificate specifications for first examination in 2018.

NEW: The Oxford Revise app helps students master the knowledge and skills essential for GCSE success and can be used for all year-round revision. Sign-up and try for free at oxfordrevise.com

Kerboodle provides resources to support the AQA GCSE Science student books. Find out more about the wider course.

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Kerboodle textbook

B7.4 Diet, exercise, and disease

Learning objectives

After this topic, you should know:

- the effect of diet and exercise on the development of obesity
- how diet and exercise affect the risk of developing cardiovascular disease
- that obesity is a risk factor for type 2 diabetes.

The evidence is building that your weight and the amount of exercise you take affects your risk of developing various diseases. These diseases can be life-changing and even life-threatening.

Diet, exercise, and obesity

If you eat more food than you need, the excess is stored as fat. You need some body fat to cushion your internal organs and act as an energy store. However, over time regularly eating too much food will make you overweight and then obese.

Carrying too much weight is often inconvenient and uncomfortable. Far worse, obesity can lead to serious health problems, such as type 2 diabetes (high blood sugar levels, which are hard to control), high blood pressure, and heart disease.

Exercise and health

The food you eat transfers energy to your muscles as they work from respiration, so the amount of exercise you do affects the amount of respiration in your muscles, and the amount of food you need. People who exercise regularly are usually much fitter than people who take little exercise. People who take regular exercise make bigger muscles, up to 40% of their body mass, and muscle tissue needs much more energy to be transferred from food than body fat. People who exercise regularly have fitter hearts and bigger lungs than people who don't exercise. But exercise doesn't always mean time spent training or 'working out' in the gym. Walking to school, running around the house looking after small children, or doing a physically active job all count as exercise too. Between 60 and 75% of your daily food intake is needed for the basic reactions that keep you alive. About 10% is needed to digest your food so only the final 15–30% is affected by your physical activity!

Scientists and doctors have collected lots of evidence that people who exercise regularly are less likely to develop cardiovascular disease than people who do not exercise. They are less likely to suffer from many other health problems too, including type 2 diabetes (see later).

Synoptic link

You can find out about the effect of fitness on the way the body reacts to exercise in Topic B9.2.

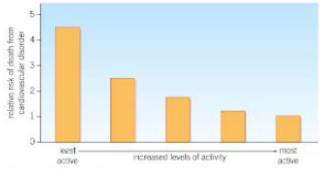


Figure 1 *The effect of exercise on the risk of death associated with cardiovascular disease in men and women*

Here are some of the causal mechanisms that explain why exercise helps to keep you healthy. You will have more muscle tissue, increasing your metabolic rate, so you are less likely to be overweight. This reduces the risk of developing arthritis, diabetes, and high blood pressure, for example. Your heart will be fitter and develop a better blood supply. Regular exercise lowers your blood cholesterol levels and helps the balance of the different types of cholesterol. This reduces your risk of fatty deposits building up on your coronary arteries, so lowering your risk of heart disease and other health problems.

Obesity and type 2 diabetes

In type 2 diabetes, either your body doesn't make enough insulin to control your blood sugar levels or your cells stop responding to insulin. This can lead to problems with circulation, kidney function, and eyesight, which may eventually lead to death. Type 2 diabetes gets more common with age and some people have a genetic tendency to develop it. The evidence is now overwhelming that being overweight or obese and not doing much exercise are risk factors for type 2 diabetes at any age. Type 2 diabetes is becoming increasingly common in young people. By 2025, an estimated 4 million people in the UK will have diabetes and 90% of those cases will be type 2. Fortunately most people can restore their normal blood glucose balance simply by eating a balanced diet with controlled amounts of carbohydrate, losing weight, and doing regular exercise.

1. Explain why people who exercise regularly are usually healthier than people who take little exercise. [5 marks]
2. Exercise levels and obesity levels are often linked. Suggest reasons for this. [4 marks]
3. Based on the data in Figure 1, what is the relative risk of suffering cardiovascular disease in men who exercise least compared to men who exercise most? [2 marks]
4. Type 2 diabetes has been described as an epidemic. It was observed that if it is an epidemic, it is an epidemic that particularly affects women. Look at the data in Figure 2 and evaluate these statements, taking into account the scientific evidence. Suggest both the reasons for the observations and how the 'epidemic' might be controlled. [6 marks]

Synoptic links

You will learn more about both type 1 and type 2 diabetes in Topic B11.2 and Topic B11.3.

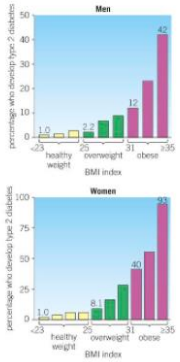
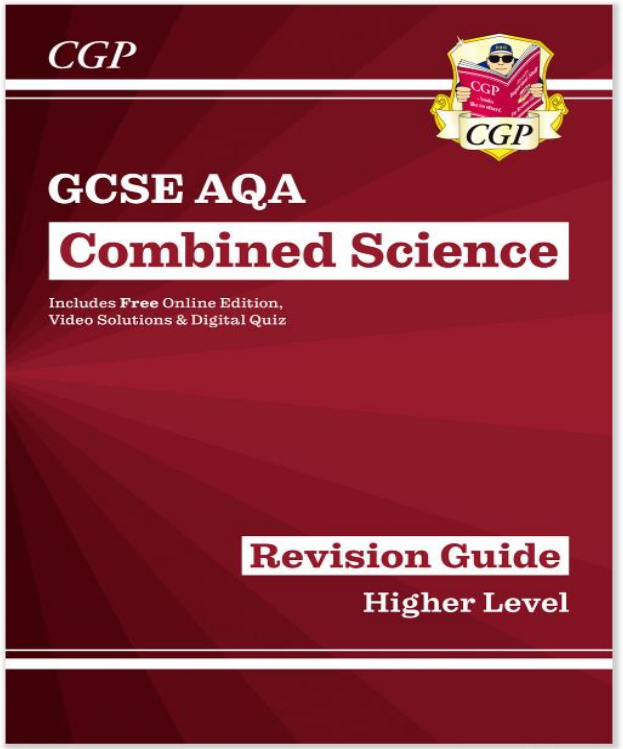


Figure 2 *The effect of obesity on the risk of developing type 2 diabetes in men and women*

Key points

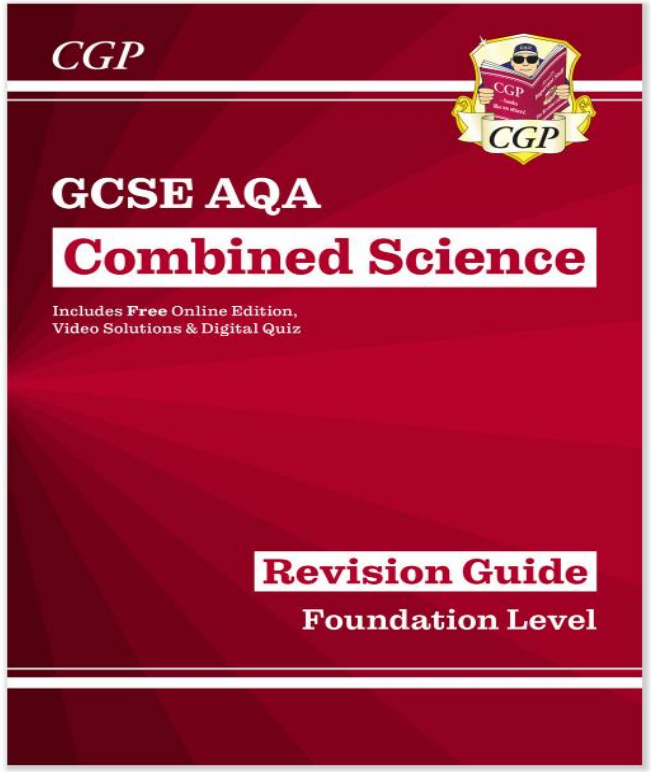
- Diet affects your risk of developing cardiovascular and other diseases directly through cholesterol levels and indirectly through obesity.
- Exercise levels affect the likelihood of developing cardiovascular disease.
- Obesity is a strong risk factor for type 2 diabetes.

Revision guides



We have already ordered these for every student in year 11 to use

These are great for using to make flash cards



Textbook loans

Southchurch High School Book Loan Agreement (Students)

1. This agreement is between:

1) Southchurch High School ("the school")

And

2) Parent/carer and student ("the parent/carer" and "I")

STUDENT'S FULL NAME	
PARENT/CARER'S FULL NAME	
HOME ADDRESS	

The following books are being provided.

Book(s) Loaned	Book number	Value
Biology		£23
Chemistry		£23
Physics		£23

This agreement covers the period from the date the equipment is issued through to the return date of the device to the school and governs the use and care of the books assigned to the parent/carer's child (the "student").

All issued equipment shall remain the sole property of the school and is governed by the school's policies.

This agreement sets the conditions for taking a Southchurch High School textbook* ("the equipment")] home.

I confirm that I have read the terms and conditions set out in the agreement and my signature at the end of this agreement confirms that I and the student will adhere to the terms of loan.

2. Damage/loss

By signing this agreement, I agree to take full responsibility for the loan equipment issued to the student and I have read or heard this agreement read aloud and understand the conditions of the agreement.

I understand that I and the student are responsible for the equipment at all times whether on the school's property or not.

If the equipment is damaged, lost or stolen, I will immediately inform the school, and I acknowledge that I am responsible for the reasonable costs requested by the school to repair or replace the equipment. If the equipment is stolen, I will also immediately inform the police.

I agree to keep the equipment in good condition and to return it to the school on their demand from the school in the same condition.

I will not leave the equipment unsupervised in unsecured areas.

3. Personal use

I agree that the student will only use this device for educational purposes and not for personal use and will not loan the equipment to any other person.

4. Return date

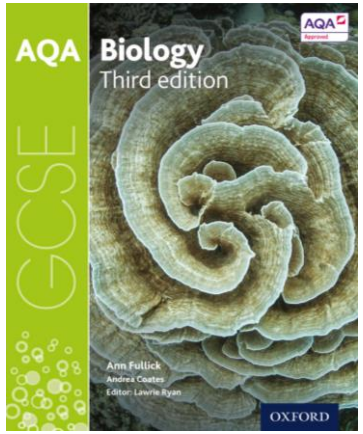
I will return the device in its original condition to Southchurch High School ICT Department within 7 days of being requested to do so.

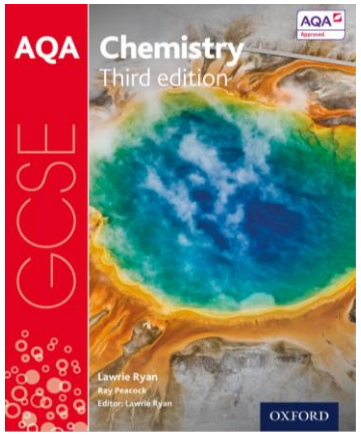
I will ensure the return of the equipment to the school if the student no longer attends the school.

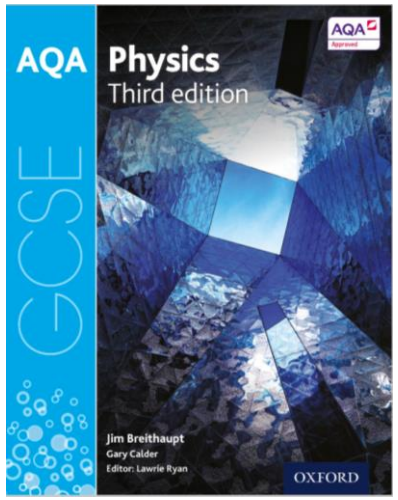
5. Consent

By signing this form, I confirm that I have read and agree to the terms and conditions set out above.

STUDENT'S FULL NAME	
PARENT'S FULL NAME	
PARENT'S SIGNATURE	

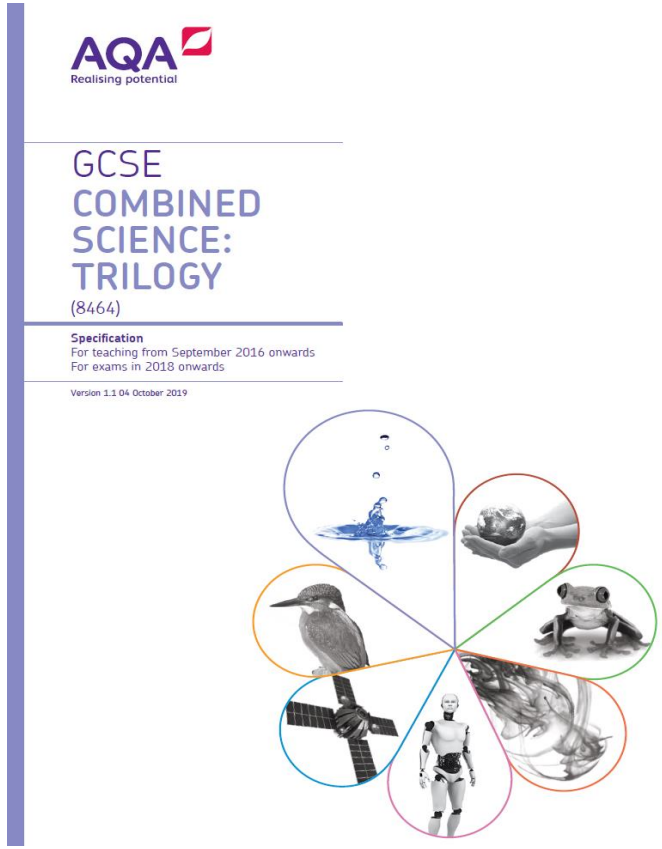


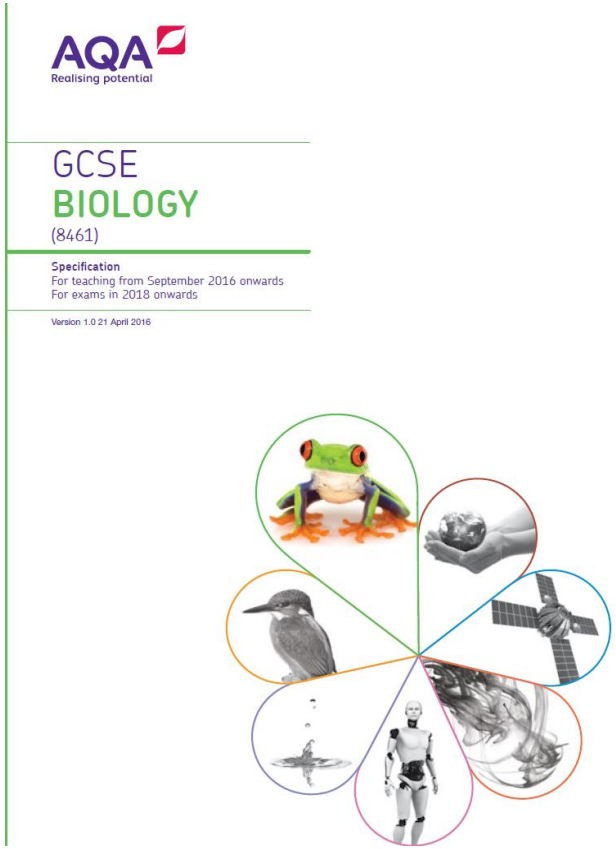




Aimed at the triple science students

Specifications





Print off

Store in your folder

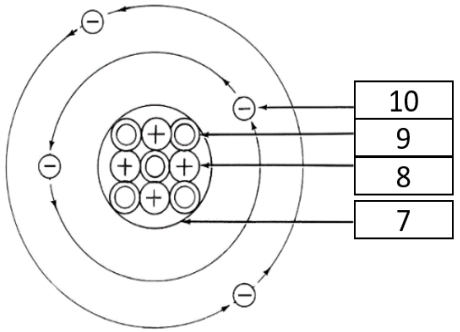
Highlight sections you don't yet know

Knowledge organisers

Physics Kerboodle: P7 Radioactivity

Name:_____

1. Keywords	
1. Atom	The smallest possible piece of an element. Has a radius of 0.1nm (or $1x10^{-10}$m).
2. Element	A substance in which all the atoms have the same atomic number.
3. Isotope	Atoms with the same number of protons but different numbers of neutrons.
4. Molecule	Two or more atoms bonded together
5. Compound	Two or more different atoms bonded together
6. Mixture	At least two different elements or compounds together. Can be separated easily.
7. Nucleus	The centre of an atom. Contains protons and neutrons
8. Proton	A positively charged particle found in the nucleus
9. Neutron	A neutral particle found in the nucleus. Has no charge
10. Electron	A negatively charged particle found in energy levels (shells) around the nucleus



2. Properties of sub-atomic particles

Particle	Relative mass	Relative charge	Location
Proton	1	+1	Nucleus
Neutron	1	0	Nucleus
Electron	0	-1	Shells

Key

relative atomic mass
atomic symbol
name
atomic (proton) number

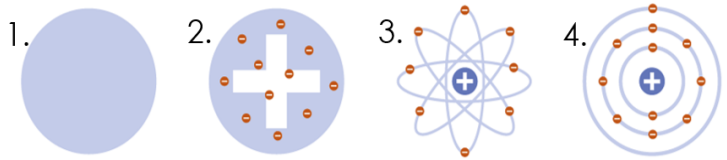
1
H
hydrogen
1

3. Using the periodic table

Number of..	Is the…	Found by..
Protons	Atomic (proton) number	Smaller number on periodic table
Electrons	Atomic (proton) number	Smaller number on periodic table
Neutrons	Difference between the atomic mass and atomic number	Big number – small number

4. History of the atom

Discovery	By	Model	Diagram
Solid particle called atom	John Dalton	Particle: solid spheres	1
The electron	JJ Thompson	Plum pudding: positive 'cake' with negative 'plums'	2
Nucleus	Rutherford	Nuclear: Positive nucleus surrounded by electrons (**gold-leaf experiment**)	3
Neutron	James Chadwick	Nuclear: Now with protons and neutrons in nucleus	3
Energy levels (shells)	Niels Bohr	Planetary: Electrons now 'orbit' in different shells	4



Print these off in colour

Store in your folder

Use to make flash cards

Science revision folder

I have asked all year 11 students to acquire a Lever arch folder just for science

Divide this folder into 6 sections:

- Biology paper 1
- Biology paper 2
- Chemistry paper 1
- Chemistry paper 2
- Physics paper 1
- Physics paper 2

In each section goes your knowledge organisers, specifications, mocks, other past papers and anything else relevant to that paper

Use this folder to make sure that you revise the right content for the paper you are sitting!

Resources

- Lessons - BE IN CLASS EVERY LESSON, YOUR TEACHER IS YOUR BEST RESOURCE
- Revision guides – MUST BE AQA 9-1 SCIENCE
- Textbooks – Kerboodle. Loan a paper copy.
- Intervention – Triple science already running, science intervention starts soon

Thank you for listening

Any questions?