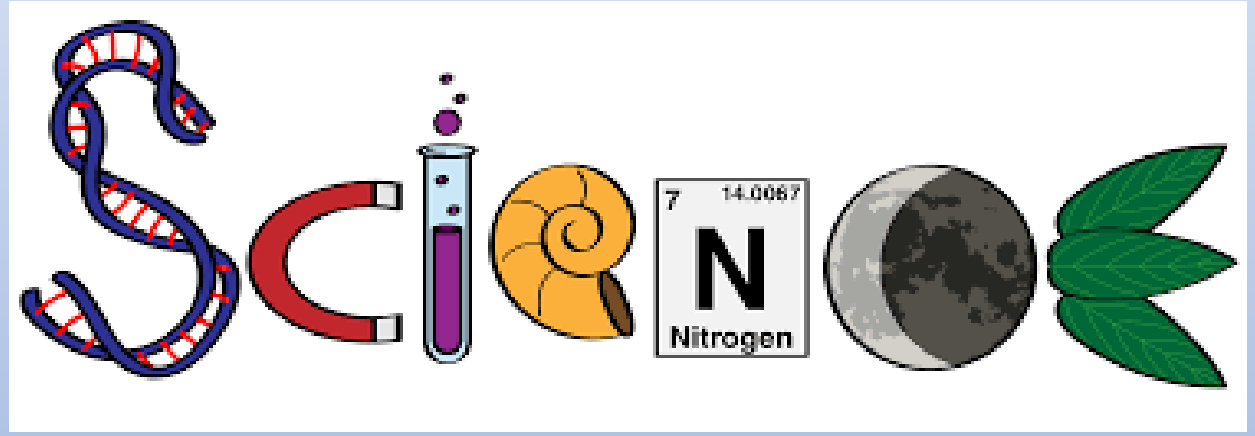


Matthew Hart
Science Faculty

Important changes to GCSEs within Science - linked to disruption

There are no changes to the GCSE specifications

Students will be given a formula sheet

The only change is that required practical's do not have to be completed but only observed.

One of the best ways to…

Know what you need to know

Discover areas of weakness

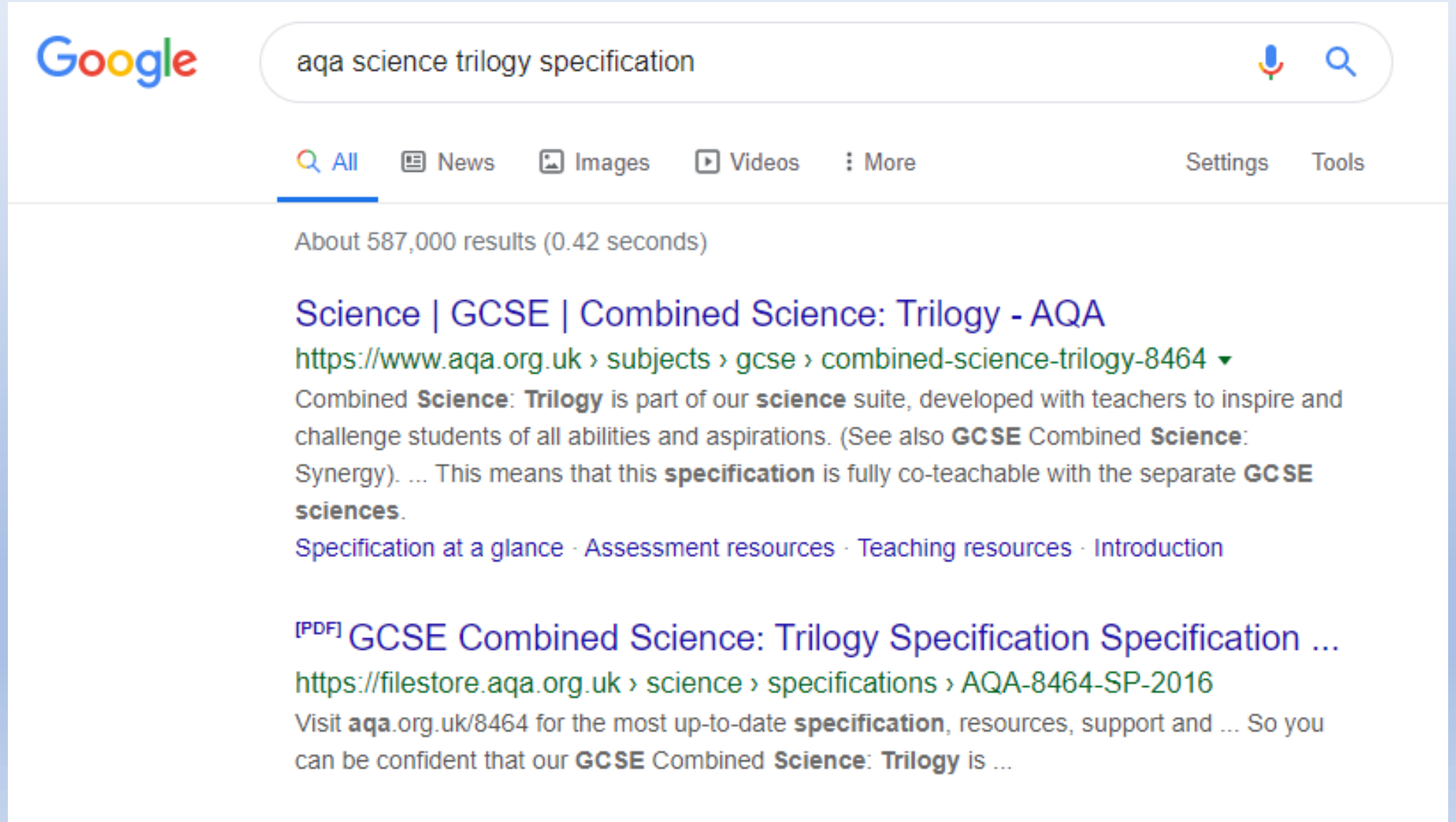
is to use…

Specifications

Personalised learning

Past Paper Question

Where are they?



AQA-8464-SP-2016.PDF (SECURED) - Adobe Acrobat Reader 2017

File Edit View Window Help

Home Tools AQA-8464-SP-201... ×

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AQA
Realising potential

What do they look like?

GCSE
COMBINED
SCIENCE:
TRILOGY
(8464)

Specification
For teaching from September 2016 onwards
For exams in 2018 onwards

Version 1.1 04 October 2019

6.1.1.1 Energy stores and systems

Content	Key opportunities for skills development
A system is an object or group of objects. There are changes in the way energy is stored when a system changes. Students should be able to describe all the changes involved in the way energy is stored when a system changes, for common situations. For example: • an object projected upwards • a moving object hitting an obstacle • an object accelerated by a constant force • a vehicle slowing down • bringing water to a boil in an electric kettle. Throughout this section on Energy students should be able to calculate the changes in energy involved when a system is changed by: • heating • work done by forces • work done when a current flows	The link between work done (energy transfer) and current flow in a circuit is covered in Work done and energy transfer (page 146). WS 4.5

AQA Physics (8463) from 2016 Topics P4.1. Energy				
Topic	**Student Checklist**	**R**	**A**	**G**
Chapters 1 and 2 – Conservation and dissipation of energy Energy transfer by heat	Define a system as an object or group of objects and state examples of changes in the way energy is stored in a system			
	Describe how all the energy changes involved in an energy transfer and calculate relative changes in energy when the heat, work done or flow of charge in a system changes			
	Use calculations to show on a common scale how energy in a system is redistributed			
	Calculate the kinetic energy of an object by recalling and applying the equation: $[E_k = ½mv^2]$			
	Calculate the amount of elastic potential energy stored in a stretched spring by applying, but not recalling, the equation: $[E_e = ½ke^2]$			
	Calculate the amount of gravitational potential energy gained by an object raised above ground level by recalling and applying, the equation: $[E_e = mgh]$			
	Calculate the amount of energy stored in or released from a system as its temperature changes by applying, but not recalling, the equation: $[\Delta E = mc\Delta\theta]$			
	Define the term 'specific heat capacity'			
	Required practical 1: *investigation to determine the specific heat capacity of one or more materials.*			
	Define power as the rate at which energy is transferred or the rate at which work is done and the watt as an energy transfer of 1 joule per second			
	Calculate power by recalling and applying the ***equations:*** $[P = E/t \ \& \ P = W/t]$			
	Explain, using examples, how two systems transferring the same amount of energy can differ in power output due to the time taken			
	State that energy can be transferred usefully, stored or dissipated, but cannot be created or destroyed and so the total energy in a system does not change			
	Explain that only some of the energy in a system is usefully transferred, with the rest 'wasted', giving examples of how this wasted energy can be reduced			
	Explain ways of reducing unwanted energy transfers and the relationship between thermal conductivity and energy transferred			
	Describe how the rate of cooling of a building is affected by the thickness and thermal conductivity of its walls			
	Required practical 2: *investigate the effectiveness of different materials as thermal insulators and the factors that may affect the thermal insulation properties of a material.*			
	Calculate efficiency by recalling and applying the equation: ***[efficiency = useful power output / total power input]***			
	HT ONLY: Suggest and explain ways to increase the efficiency of an intended energy transfer			
Chapter 3 – Energy Resources	List the main renewable and non-renewable energy resources and define what a renewable energy resource is			
	Compare ways that different energy resources are used, including uses in transport, electricity generation and heating			
	Explain why some energy resources are more reliable than others, explaining patterns and trends in their use			
	Evaluate the use of different energy resources, taking into account any ethical and environmental issues which may arise			
	Justify the use of energy resources, with reference to both environmental issues and the limitations imposed by political, social, ethical or economic considerations			

Learning checklists

Identify and describe scalar quantities and vector quantities

R	A	G

Past Papers

AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

GCSE
PHYSICS

H

Higher Tier Paper 1

Wednesday 23 May 2018 Afternoon Time allowed: 1 hour 45 minutes

Materials
For this paper you must have:
- a ruler
- a scientific calculator
- the Physics Equation Sheet (enclosed).

Instructions
- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the space provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.
- In all calculations, show clearly how you work out your answer.

Information
- The maximum mark for this paper is 100.
- The marks for questions are shown in brackets.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.

For Examiner's Use	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
TOTAL	

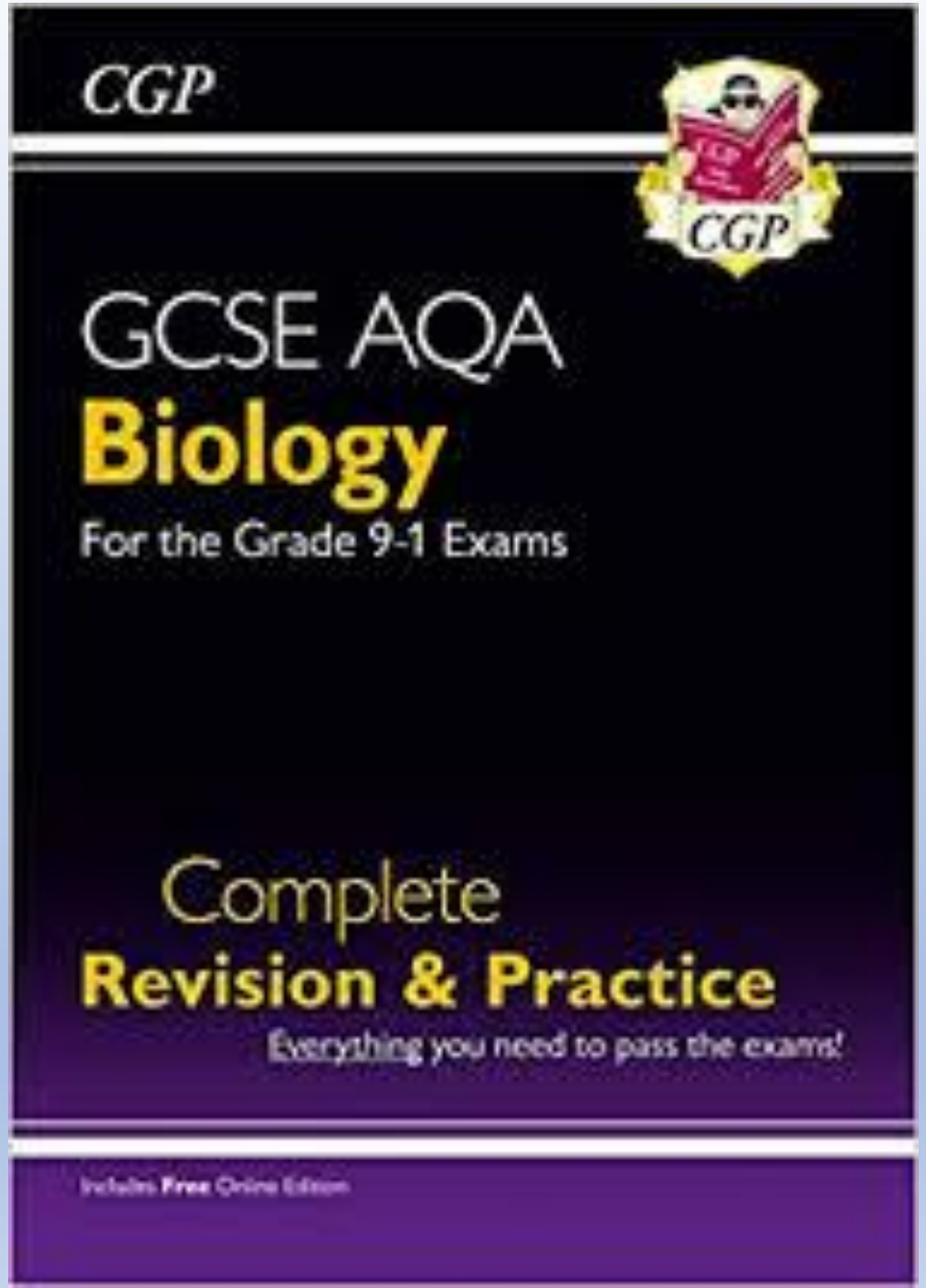
Act on area of weakness

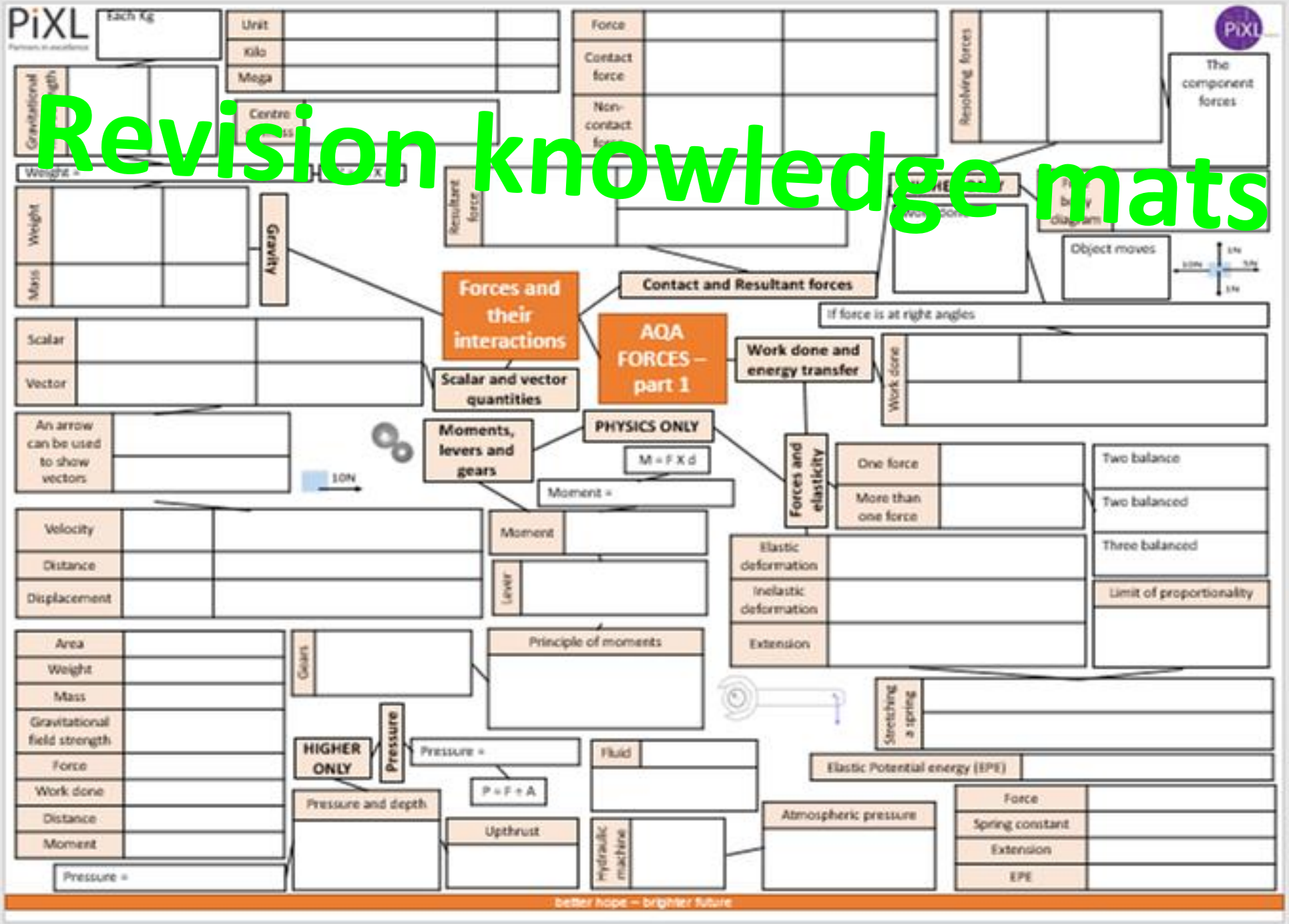
- Revision guides
- Revision knowledge mats
- Revision videos
- Seneca
- BBC Bitesize
- Independence booklets
- Revision sessions
- Contact teachers

Revision guides
Practice books

AQA 9-1 exam

Science department sells CGP books at roughly 50% RRP



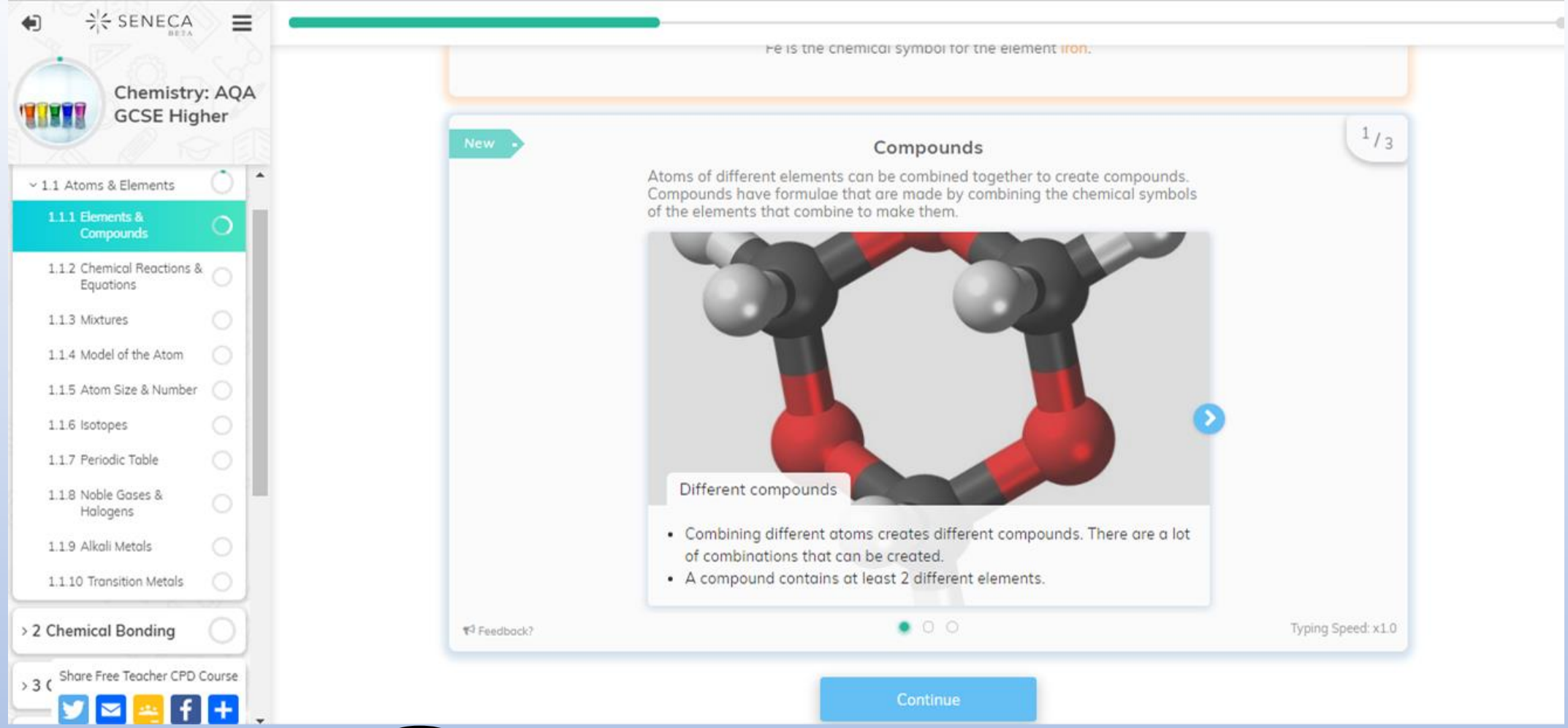


Revision knowledge mats

Revision videos

Primrose Kitten

Free Science Lessons



Seneca - website

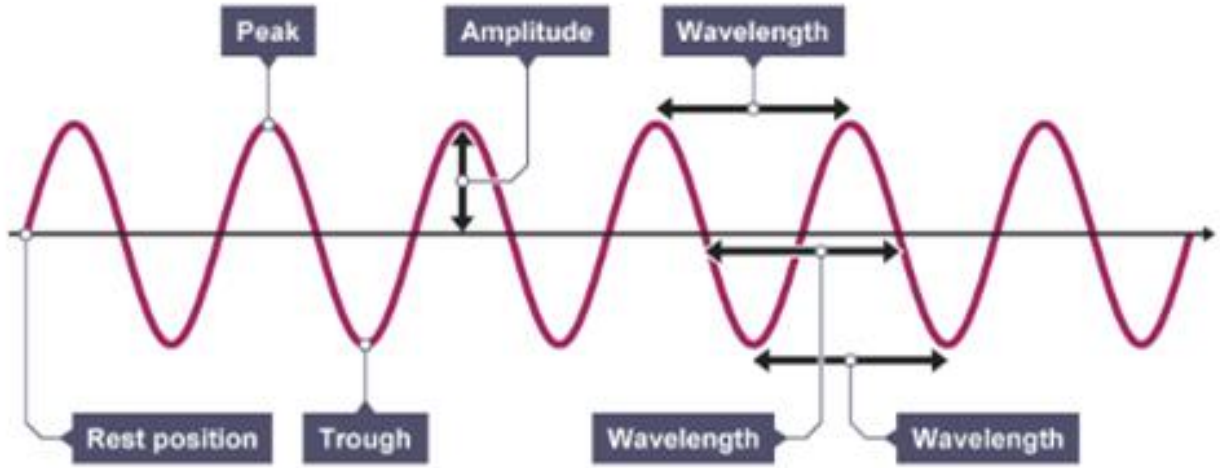
BBC Bitesize

Parts of a wave

Waves are described using the following terms:

- **rest position** - the undisturbed position of particles or fields when they are not vibrating
- **displacement** - the distance that a certain point in the medium has moved from its rest position
- **peak** - the highest point above the rest position
- **trough** - the lowest point below the rest position
- **amplitude** - the maximum displacement of a point of a wave from its rest position
- **wavelength** - distance covered by a full cycle of the wave, usually measured from peak to peak, or trough to trough
- **time period** - the time taken for a full cycle of the wave, usually measured from peak to peak, or trough to trough
- **frequency** - the number of waves passing a point each second

Diagram of a wave



QUESTION:	**What is a radioactive substance?**
Sources:	**Website –** 1. https://www.youtube.com/watch?v=V-UtgheMNNU 2. http://www.darvill.clara.net/nucrad/types.htm

1. **A radioactive substance contains unstable nuclei that become stable by emitting radiation.**
2. **There are three main types of radiation – alpha, α, beta, β and gamma, γ.**
3. **Radioactive decay is random – it cannot be predicted.**
4. **All radioactive sources emit alpha, beta and gamma radiation.**
5. **A Geiger counter is used to measure the amount of radioactivity given off by a substance.**

The Risks of Radiation Therapy

News article: https://www.cheatsheet.com/health-fitness/these-popular-cancer-treatments-have-the-most-dangerous-side-effects.html/?a=viewall
NHS article: http://www.nhs.uk/Conditions/Radiotherapy/Pages/Introduction.aspx
Discussion article: https://health.usnews.com/health-news/patient-advice/articles/2015/05/22/radiation-evolving-choices-in-cancer-treatment
Real article: http://www.cancerresearchuk.org/about-cancer/cancer-in-general/treatment/radiotherapy/follow-up/long-term-side-effects

Task 1:
You need to produce a 1 page essay on the risks surrounding radiation therapy.

Essay section	Activity
Introduction	What is radiation therapy? What is radiation therapy used to treat?
Describe	Describe how radiation therapy would be conducted using a specific type of tumor, e.g. brain, breast, liver.
Explore	Explore the risk associated with having radiation therapy.
Evaluate	Evaluate whether the benefit outweighs the risk for the patient.

Compare nuclear fission and nuclear fusion, their role in generating energy and their long-term futures.

Background
Both fission and fusion are nuclear reactions that produce energy, but that is where their similarities end. Fission is the splitting of a heavy, unstable nucleus into two lighter nuclei, and fusion is the process where two light nuclei combine together releasing vast amounts of energy. Both have a place in the energy generation industry but, where is it?

Source articles
http://www.passmyexams.co.uk/GCSE/physics/nuclear-fusion.html
http://www.passmyexams.co.uk/GCSE/physics/nuclear-fission.html
http://www.gcsescience.com/prad37-nuclear-power-moderator-control-rod.htm
http://www.passmyexams.co.uk/GCSE/physics/nuclear-reactor.html
https://www.youtube.com/watch?v=LekacMuM12Y
https://www.youtube.com/watch?v=mZsaaturR6E
http://www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway_pre_2011/living_future/3_fuels_for_power3.shtml
http://www.bbc.co.uk/education/clips/zvmcd2p
http://www.world-nuclear.org/information-library/current-and-future-generation/outline-history-of-nuclear-energy.aspx
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4678124/

Use other sources as necessary.

Task:
Produce a scientific poster on the role of nuclear fission and nuclear fusion in the generation of energy.

Contact your teachers

- Finds us at school
- Email