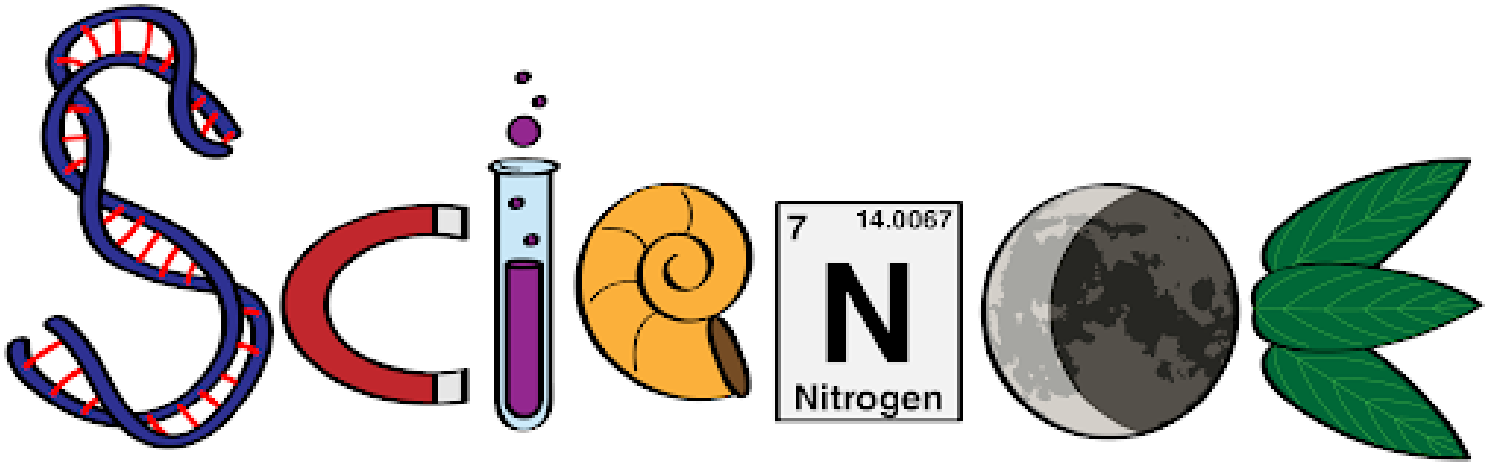
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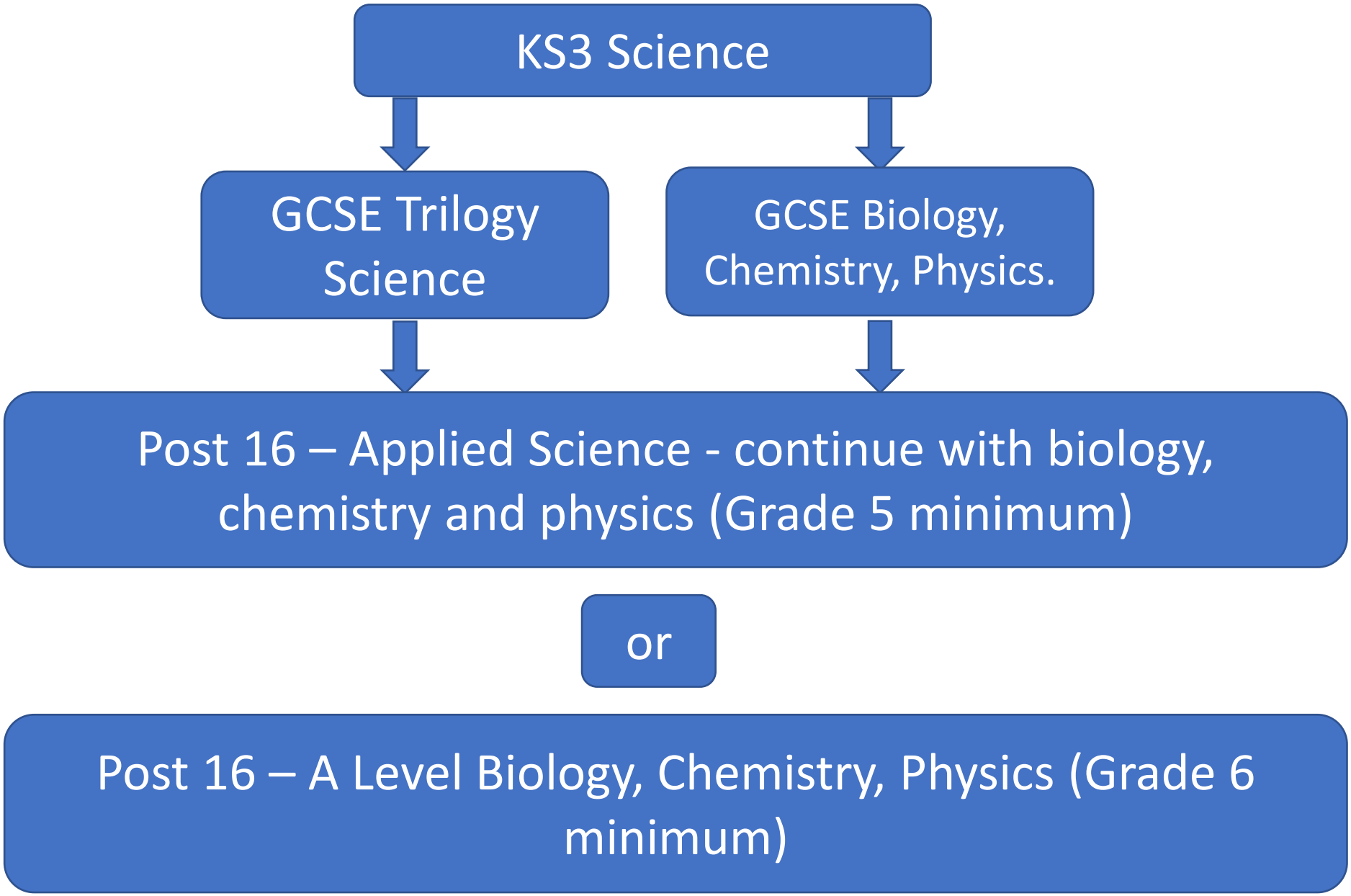

KS3 Science
GCSE Trilogy Science
GCSE Biology, Chemistry, Physics.
Post 16 – Applied Science - continue with biology, chemistry and physics (Grade 5 minimum)
or
Post 16 – A Level Biology, Chemistry, Physics (Grade 6 minimum)

Key Stage Three

Science

Year 7
Cells
Environment and Feeding Relationships
Movement
Reproduction
Acids and alkalis
States of Matter
Solutions
Earth and Beyond
Electricity
Energy
Forces and their Effects

Year 8
Food and Digestion
Photosynthesis
Respiration
Variation & Classification
Atoms, Elements, Compounds and Mixtures
Chemical Reactions
Periodic Table
Light & the Eye
Magnets & Electromagnets
Pressure & Moments
Sound & the Ear

Key Stage Three
Science

Year 9

To prosper in this modern age requires the capacity to grasp the essentials of diverse problems, recognise meaningful patterns, retrieve and apply relevant knowledge.

A good grasp of the scientific process can provide our children with the transferrable skills they need to achieve this.

Science education also needs to take account of changes in the work place that require ability to link science with engineering, technology and mathematics (STEM).

Key Stage Three
Science

Year 9

In year 9, there is a greater emphasis on the scientific process and linking together different aspects of science.

For example, General Hospital has sections on medical imaging, food and diet, microbes and drug development.

In addition, there are several STEM projects undertaken throughout the year that not only train the students in science skills but also transferrable skills such as problem solving and team work.

STEM LEARNING

BEST™

Best Evidence Science Teaching

Salters' Institute

UNIVERSITY OF YORK
SCIENCE EDUCATION GROUP

Education Endowment Foundation

1 Preconceptions: Build on the ideas that pupils bring to lessons

2 Self-regulation: Help pupils direct their own learning

3 Modelling: Use models to support understanding

4 Memory: Support pupils to retain and retrieve knowledge

5 Practical Work: Use practical work purposefully and as part of a learning sequence

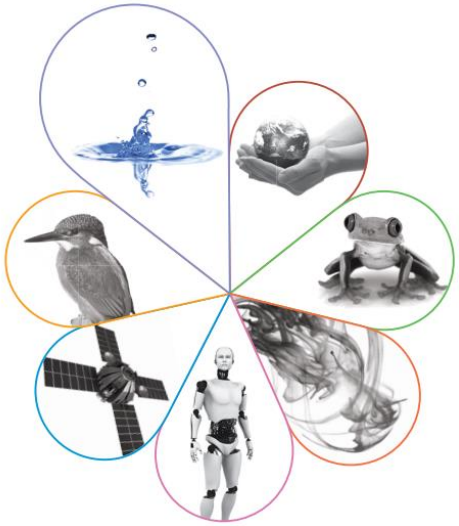
6 Language of Science: Develop scientific vocabulary and support pupils to read and write about science

7 Feedback: Use structured feedback to move on pupils' thinking

Building on knowledge from previous years and key stages.

Combined Science

AQA
Realising potential



2 GCSE grades

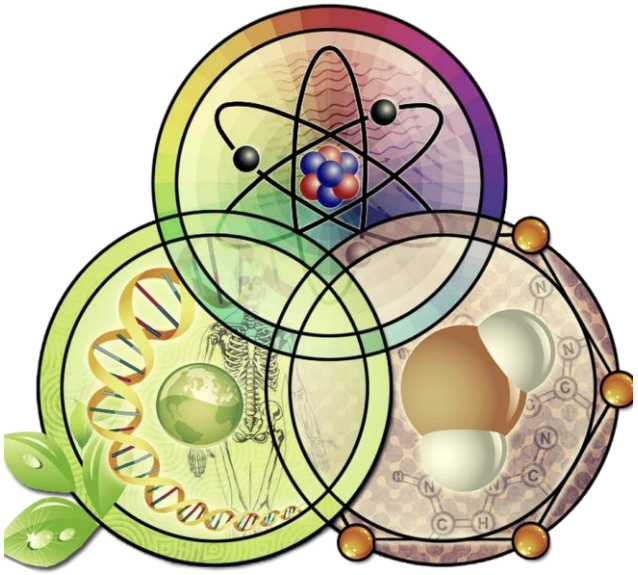
6 exams, each 1 hour 15 minutes

2 biology 2 chemistry 2 physics

Total score from all 6 papers <u>combined</u>

Topics taught as discrete units

More than adequate to go on to study A Level sciences



Triple / Separate Science

AQA
Realising potential

3 GCSE grades

6 exams, each 1 hour 45 minutes

2 biology 2 chemistry 2 physics

Scores from the 3 subjects not combined

Subjects taught as discrete units

Increased content for each as opposed to harder

Legacy GCSE science		Current GCSE science	
Foundation	Higher	Foundation	Higher
			9
	A*		8
	A		7
	B		6
C	**C**	**5**	**5**
		4	**4**
D	**D**	3	(3)
E	(E)	2	
F			
G		1	

Which Tier?

- There is nothing on certificates that details the tier of entry. So a grade 4 or 5 on foundation tier has the same value and is indistinguishable from a grade gained on the higher tier.

- *"Students are at risk of missing out on two GCSE grades if they do not perform as well as expected. We recommend that students who are expected to achieve a grade 4-4 or 5-4 should be entered for foundation tier."*

Sally Collier
Chief Regulator, Ofqual

Tier of entry is only decided late on in year 11.

Key Stage Three

Science

3 Gold assessments

1 Platinum assessment

Short formative assessments after each topic to identify gaps and plug them.

Q1. Herefords and Friesians are two breeds of cattle.
Herefords produce high quality meat. Friesians produce lots of milk.

The drawings below show a Hereford cow and a Friesian cow.

Hereford cow Friesian cow

(a) (i) The two breeds of cattle are different in appearance from each other.
What causes the variation between the two breeds of cattle?

.....

.....

1 mark

(ii) Suggest **two** environmental factors which can affect the amount of meat or milk cattle produce.

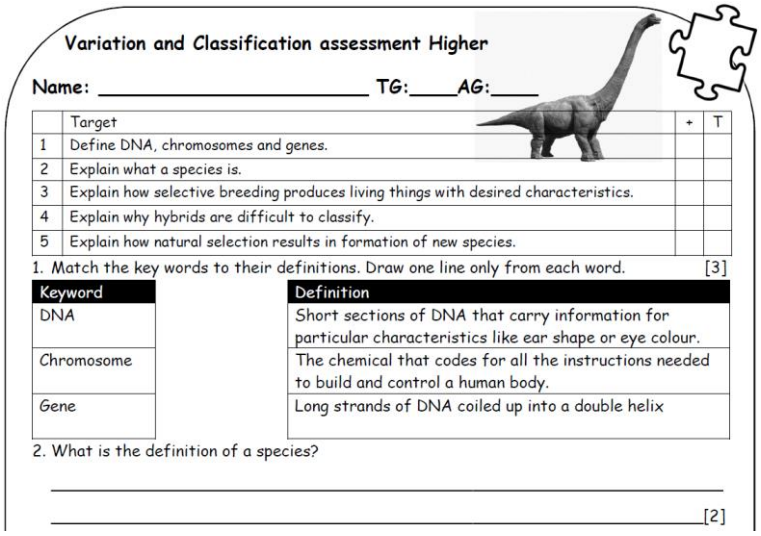
1. .....

.....

2. .....

.....

2 marks



Variation and Classification assessment Higher

Name: _____ **TG:**____**AG:**____

	Target	+	T
1	Define DNA, chromosomes and genes.		
2	Explain what a species is.		
3	Explain how selective breeding produces living things with desired characteristics.		
4	Explain why hybrids are difficult to classify.		
5	Explain how natural selection results in formation of new species.		

1. Match the key words to their definitions. Draw one line only from each word. [3]

Keyword	Definition
DNA	Short sections of DNA that carry information for particular characteristics like ear shape or eye colour.
Chromosome	The chemical that codes for all the instructions needed to build and control a human body.
Gene	Long strands of DNA coiled up into a double helix

2. What is the definition of a species?

_____

_____ [2]

Summary Sheet: Cells

Cells are the basic building blocks of all animals and plants. They are so small, you need to use a light microscope to see them

The light microscope

A light microscope uses a series of lenses to produce a magnified image of an object:

1. The object is placed on a rectangular glass slide
2. The slide is placed on a stage with a light source below
3. Light shines through the object and into the objective lens
4. The light passes through the eyepiece lens and from there into your eye

Making a slide

Onion cells are easy to see using a light microscope. Here is a typical method for preparing a slide:

1. Cut open an onion
2. Use forceps to peel a thin layer from the inside
3. Spread out the layer on a microscope slide
4. Add a drop of iodine solution to the layer
5. Carefully place a cover slip over the layer

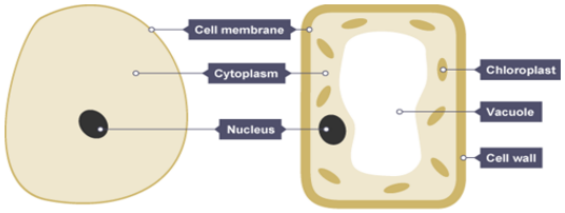
Observing cells

When you observe cells, it is usual to make a drawing of what you see. Very often there is so much to see that you can only aim to draw part of it:

- use pencil rather than pen or colours
- outline the features as accurately as you can
- use as little shading as possible
- label your drawing with the name of the sample and the total magnification you used

Animal cells and plant cells

Animal cells usually have an irregular shape, and plant cells usually have a regular shape. Cells are made up of different parts. It is easier to describe these using diagrams.



1 An organ is:

A another name for a living thing.

B a large part of an animal or plant that does a very important job.

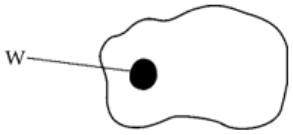
C the part of the body that makes sounds.

2 Organs contain:

A hearts. **B** tissues.

C glass. **D** newspaper.

3 On this drawing of an animal cell, what is part labelled 'W'?



A cell surface membrane

B chloroplast

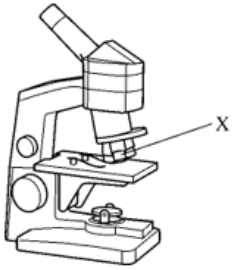
C nucleus

4 On the drawing of the animal cell, what does part 'W' do?

A makes energy **B** makes food

C controls the cell **D** holds the cell together

5 On the drawing of a microscope, what is the name of the part labelled 'X'?



A stage

B focusing wheel

C objective lens

D base

Get them to self-test, a lot.

Research shows that testing in order to recall content is the best way of getting us to think hard.

Thinking about and getting the answer is much better than re-reading notes.

The more we recall information the better it sticks in our long-term memory. This should be in the form of quizzing themselves where possible.

Talk to them

Get your child to tell you what they have learnt or are revising, then quiz them at random times: at breakfast, at the dinner table, or even in the car.

Ask them questions that relate to their studies and get them to think hard about the answer.

Get them to explain their answer. Adding reason to an answer helps them to remember.

Learn keywords and definitions by heart

Learning the correct definitions will help gain extra marks, so long as they use them correctly.

Produce memory cards with the key word and the definition on to test them regularly.

Use memory tricks

Mnemonics, such as "Richard of York gave battle in vain" to remember the colours of the rainbow, can be a good trick to remember sequences and lists of information.

Get them to invent their own.

Making them funny or rude can be a great hook for memory!

They can be a good way of helping to store larger chunks of information.

Write them on posters and stick them up around their room or the house.

Read around the subject

Even if the content is not in the exam, understanding the subject area better helps to build links which may be valuable for those higher-grade questions.

Documentaries, websites, exam board resources and places of interest to visit can also be beneficial.

Go easy on the highlighters

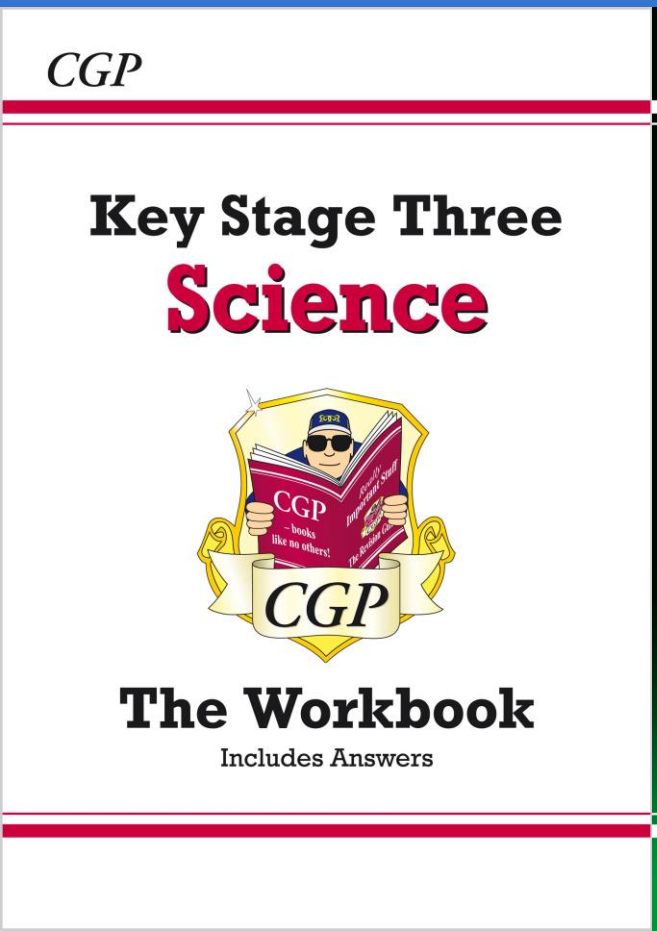
Rereading and highlighting key points is not the best way to revise.

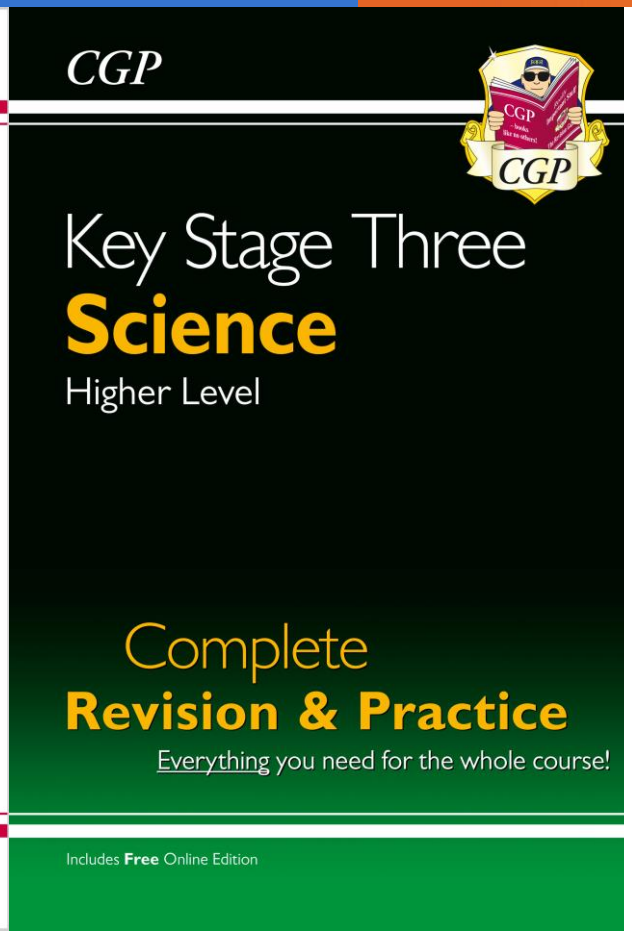
If they are unsure on a subject this may help to learn a topic, but always get them to check with a teacher that they've understood properly what they've read.

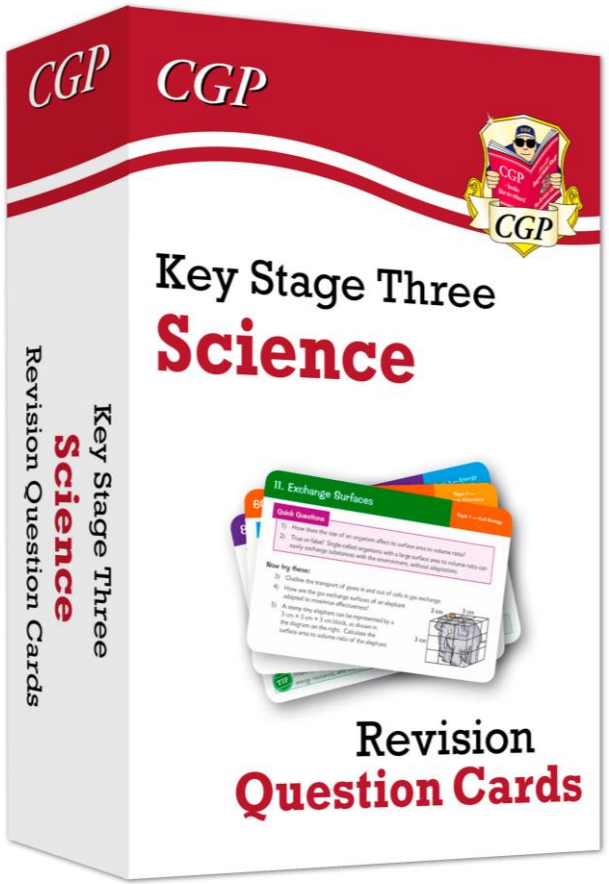
SENECA

Free interactive content to keep students engaged

BBC Bitesize







Relationships Between Organisms

Within a habitat, all living things interact with one another, whether it be a predator/prey relationship or one organism using another for shelter.

Organisms in the same habitat

- Organisms are dependent on one another for a wide range of reasons:
  - They provide a food source (any organism that is consumed).
  - They help with pollination (insects such as bees).
  - They help provide shelter (some species of tree).

In what ways are organisms dependent on each other?

1. Providing a [ ] source
2. Helping with pollination
3. Provide a shelter

Type your answer here...

Which of these are interdependencies between organisms?

Providing shelter

Living in different habitats

Being awake at different times of day

Helping in pollination

Eating different foods

Using as a food source

The answer is correct