



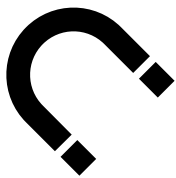
Year 11 parent information evening

Science

As a parent, what can you do to help?

What does good revision look like?





Students on both the combined science and triple science courses will sit **6 exams** in the summer.

Biology paper 1 – topics B1-B4

Chemistry paper 1 – topics C1-C5

Physics paper 1 – topics P1-P4

Biology paper 2 – topics B5-B7

Chemistry paper 2 – topics C6-C10

Physics paper 2 – topics P5-P7

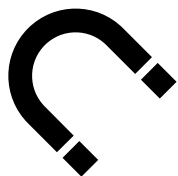
Trial exams in November-Dec

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

- **Second set of trials- Feb-March**
- Biology paper 2
- Chemistry paper 1
- Physics paper 1

This information is also available on the inside front cover of the revision guides.





NEW GCSE (9-1), (9-9 to 1-1)

SCIENCE GRADING



Students following the **triple pathway** will gain **3 GCSEs**, with a grade for ***Biology, Chemistry*** and ***Physics***.

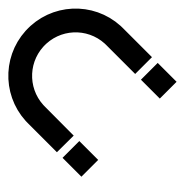
Students on the **Combined Science** course will gain **2 GCSEs** in Science. The grades are awarded in the format shown in **blue**.

A **4-4** grade is considered to be a standard pass.

The two grades are calculated using grade boundaries based on a total number of marks across all 6 papers.

BIOLOGY, CHEMISTRY, PHYSICS	COMBINED SCIENCE
9	9-9
8	9-8 8-8
7	8-7 7-7
6	7-6 6-6
5	6-5 5-5
4	5-4 4-4
3	4-3 3-3
2	3-2 2-2
1	2-1 1-1
U	U





NEW GCSE (9-1), (9-9 to 1-1)

SCIENCE GRADING



Students on the **combined science course** could be entered for **higher tier** or **foundation tier**.

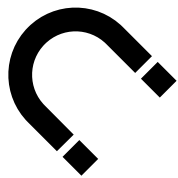
Students taking the **foundation tier papers** could achieve **up to a grade 5-5**. There tends to be more multiple-choice style and lower demand questions, however the grade boundaries will be higher.

Students taking the **higher tier papers** can achieve a **grade 4-3 up to a grade 9-9**. The demand of the questions will be higher, However the grade boundaries will be lower.

Students taking the triple science route will sit the higher tier papers. The demand of the questions will be equivalent to the demand on the Combined science higher tier.

BIOLOGY, CHEMISTRY, PHYSICS	COMBINED SCIENCE
9	9-9
8	9-8
7	8-8
6	8-7
5	7-7
4	7-6
3	6-6
2	6-5
1	5-5
U	5-4
	4-4
	4-3
	3-3
	3-2
	2-2
	2-1
	1-1
	U





Science papers will assess maths and practical skills as well as the science content.

The average across all the papers is approximately **30% maths and 15% how science works (practical skills)**.

This will largely be assessed through analysis of data provided to students in the forms of graphs or tables as well as students' knowledge of the **21 required practicals (spread across all 6 papers)**.

Students are given the opportunity to carry out the required practicals in lessons as well as to practise the sort of questions that are often asked.

It is important when revising that students don't skip the first chapter of the revision guide that goes through these skills.



Analysis of performance of students in the summer year 10 exams.

Feedback from a survey we do with students at the end of year 10 showed that many students spent **less than an hour** in total revising and preparing for the **three exam papers**.

This is nowhere near enough time as they are gaining two GCSEs or three GCSEs

Many students were only revising by reading the revision guide. This doesn't work. They need to cover it up and test themselves and then answer practice exams questions.

General revision/ key definitions for a whole topic

Step	Approx. time (minutes)	
1	10-15	Read the pages of information in your revision guide OR watch a video (type... isotopes AQA gcse into YouTube)
2	5	Create a revision card or start/ add to a mind map or spider diagram/poster of the information (see examples on the next slide) OR Set yourself a quiz on educake
3	Keep coming back to it!	Get someone to quiz you/ quiz yourself/ read through your mind map etc
4	1- 2 hours	Once you are happy with a whole topic or exam paper, find and complete/ mark some exam questions on the revision website

Remember sites like BBC bitesize are an alternative for revision guide!
Make sure to pick AQA and the correct course.

FRONT OF CARD

1. What is an isotope?
2. What does the atomic number tell us?

BACK OF CARD

1. Atoms with the same number of protons but a different number of neutrons
2. The number of protons an atom has (in the nucleus)

Spider diagram/knowledge organiser poster examples

These are added to over several revision sessions on one topic

Chlorine → 2, 8, 7 → have one white e- caping

These electron configurations can also be worked out from an element's atomic number (Z)
e.g. Chlorine's $Z = 17$
Therefore chlorine has 17 electrons - 2 in shell 1, 8 in shell 2 and 7 in shell 3

Electron Configuration

Atomic Structure

Subatomic Particle	Relative Charge	Relative Mass
Proton	+1 (positive)	1
Neutron	0 (no charge)	1
Electron	-1 (negative)	1/1836 (negligible)

Maximum electrons in shells:
1st = 2 electrons
2nd = 8 electrons
3rd = 8 electrons

Electrons
Protons
Neutrons
Electron shell

The Periodic Table
Developed by Dmitri Mendeleev, organised by mass number and chemical properties leaving gaps for elements yet to be discovered

Hydrogen (an alkali metal)
Metals / non-metals divide
Group number = no. of e- in outer shell of atom
or 8 = noble gases

Isotopes
= Same atomic no. but different mass numbers
= number of protons = different forming a different element

Relative Atomic Mass
The mass of an atom compared to an atom of Carbon-12

Mass

Period Number = number of electron shells

Group 1 = alkali metals
Group 2 = alkaline earth metals
Group 8 = noble gases
Group 9 = The halogens

Atomic Symbol
A Sodium atom:
mass number (A) = 23
atomic number (Z) = 11

Spider diagram/knowledge organiser poster example

Split into sections like the revision guide (on the contents page)

Start → Make sure you understand Topic 1 - Structure of the atom

CC5,6,7,8

Lesson 1 Ions
Atoms are more stable with a full outer shell of electrons and they will lose or gain electrons to achieve this
Atoms that lose electrons (metals) gain a positive charge. Atoms that gain electrons (non-metals) gain a negative charge. An ion is an atom with a charge
You need to be able to calculate the number of protons, neutrons and electrons in different ions and draw electron structure of ions showing their charge outside of brackets

Lesson 2 Ionic bonds
Ionic bonds form between metals and non-metals. Metals have extra electrons and they **lose** them to form positive ions. Non-metals have electron gaps and they **gain** electrons to form negative ions. In an ionic bond the metal 'gives' its electrons to the non-metals to form positive and negative ions
An ionic bond is the electrostatic attraction between a positive and negative ion

Lesson 3 Ionic compounds
Ionic compounds consist of regular arrangements of positive and negative ions called an ionic lattice
Positive and negative ions combine in fixed ratios to give neutral compounds
You can work out the charge on most positive and negative ions from their position in the periodic table and then use the cross over rule to give the formula of the compound
The formulas of some polyatomic anions you just have to learn!

Lesson 4 Properties of ionic compounds
Ionic compounds:
1. Form crystals with high melting points
2. Dissolve in water to give solutions
3. Conduct electricity when dissolved in solution or molten but not when solid
You need to be able to use the structure of an ionic compound (Lesson 3) to **explain** why ionic compounds have these properties. Use the following **keywords / ideas**

Lesson 5 Covalent bonds
Covalent bonds form between two non-metals. Non-metals have spaces for electrons and they are able to **share** electrons so it is 'as if' both atoms have a full outer shell
You need to be able to draw covalent bonds between two atoms using 'dot and cross' diagrams and stick diagrams
A covalent bond is a pair of electrons shared between the two atoms. A double covalent bond (double bond) consists of 4 shared electrons
Covalent bonds are strong bonds

Lesson 6 Simple molecular compounds
Covalent bonds are found in two types of structures - Simple molecules and giant covalent structures. Most common gases are simple molecules. A **molecule** is a small group of atoms that go around together. Simple molecular compounds have strong covalent bonds holding the atoms together in a molecule. Between the molecules there are weak intermolecular forces which are much more easily broken.
Properties
• Gases and liquids with low melting and boiling points
• Do not conduct electricity
Keywords to describe simple molecules
Shared electrons, strong covalent bonds between atoms, simple molecules, weak intermolecular forces between molecules

Lesson 7 Giant covalent structures
In giant covalent structures every atom is joined to other atoms with a strong covalent bond.
Giant covalent structures
• Hard, strong, high melting point

Lesson 8 Allotropes of carbon

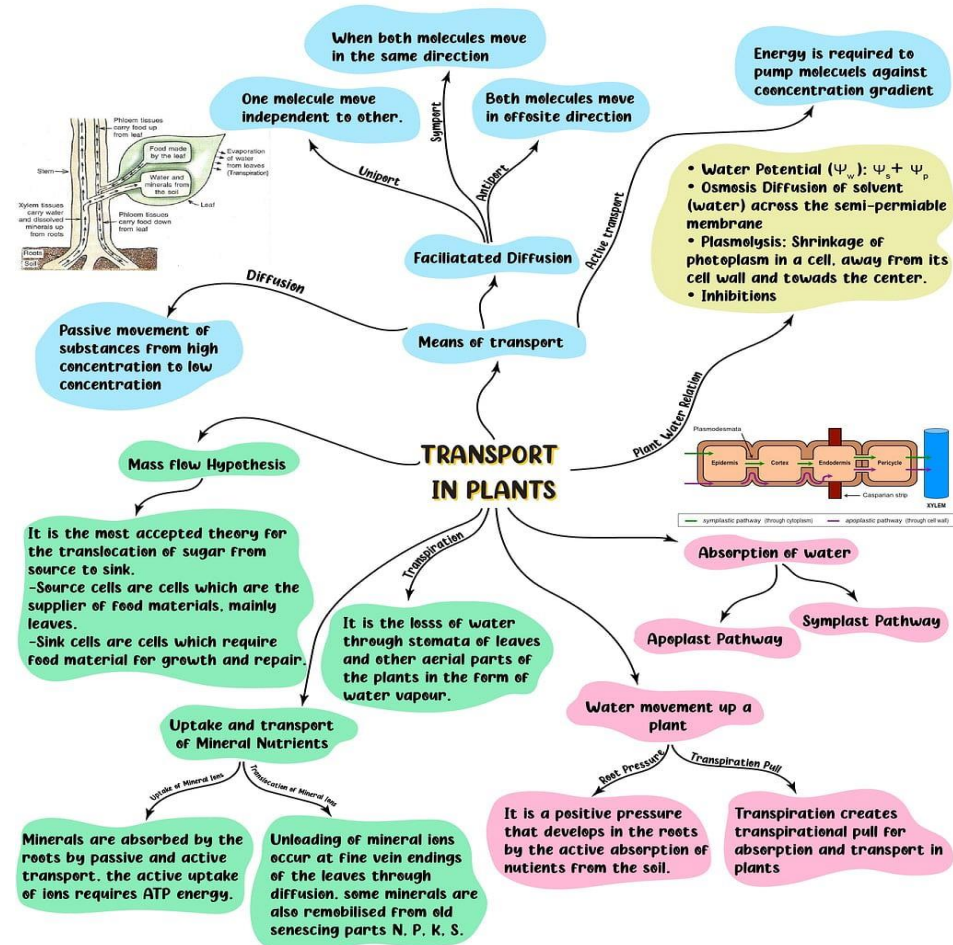
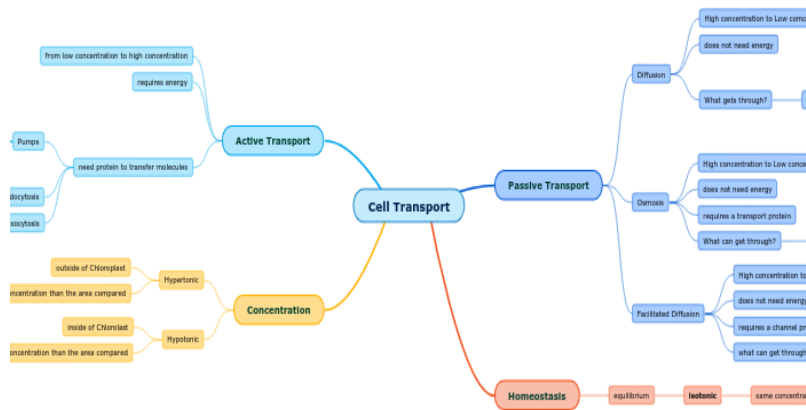
Material	Structure	Properties	Uses
Diamond	Each carbon atom is bonded to four other carbon atoms in a tetrahedral arrangement. Strong covalent bonds in all directions.	Hardest, high melting point, does not conduct electricity, does not dissolve.	Jewellery, cutting tools, abrasives.
Graphite	Each carbon atom is bonded to three other carbon atoms in a hexagonal arrangement. Weak van der Waals forces between layers.	Soft, slippery, high melting point, conducts electricity, does not dissolve.	Pencil lead, lubricants, electrodes.
Fullerene	Each carbon atom is bonded to three other carbon atoms in a spherical arrangement.	Soft, slippery, high melting point, conducts electricity, does not dissolve.	Superconductors, nanotechnology.

Lesson 9 Metallic bonding and the properties of metals
Metallic bonds form between metal atoms and metals from giant metallic structures
The structure of a metal consists of a regular arrangement of metal ions surrounded by a sea of delocalised electrons
Use of electrons

PROPERTY	EXPLANATION
Melting & boiling points	HIGH Strong attraction between metal ions and delocalised e-.
Electrical conductivity	CONDUCTS Outer shell electrons free to move.
Strength	STRONG Layers can slide while maintaining metallic bonding.
Solubility in water	INSOLUBLE

Mind map examples

These are added to over several revision sessions on one topic





Another online resource we have in Science is **EDUCAKE**.

It is a fantastic online platform where students can set their own questions on areas that may be weaker in.

Students were set homework in educake till year 10.

Year 11 Homework being only past paper

Teachers are also provided with a detailed report of how each student is performing in each area within Science, giving students a detailed review of where they should spend time revising, including;

- Maths in science
- Working scientifically
- Biology/Chemistry/Physics
- Performance by question type e.g. recall/application/data and graphs and calculations

They can also view any feedback given from teachers after they have sent a query about a question, which supports further learning.

My Educake

[Revision wizard >](#)
[View feedback from your teachers](#)

Your Upcoming Quizzes

[View all your quizzes](#)

Subject	Quiz name	Assigned by	Due
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Woohoo! You're all caught up! If your teacher sets you a quiz, you'll see it here.

Study and Quiz Yourself

KS3

GCSE

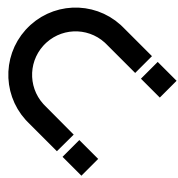
GCSE Science - AQA	77%	
Biology	0%	
Chemistry	77%	
Physics	76%	
Maths for Science	0%	
Working Scientifically	0%	

Here, the student can choose;

- Learn something new
- Revise (take a quiz or read about the subject through a guide)
- Not sure (the platform will select for them from the analysis of their current performance)

From the 'study and quiz yourself' section:

Students can study the subject area by using the online guide which leads them through step by step. They can also set a quiz for themselves to test their knowledge and understanding.

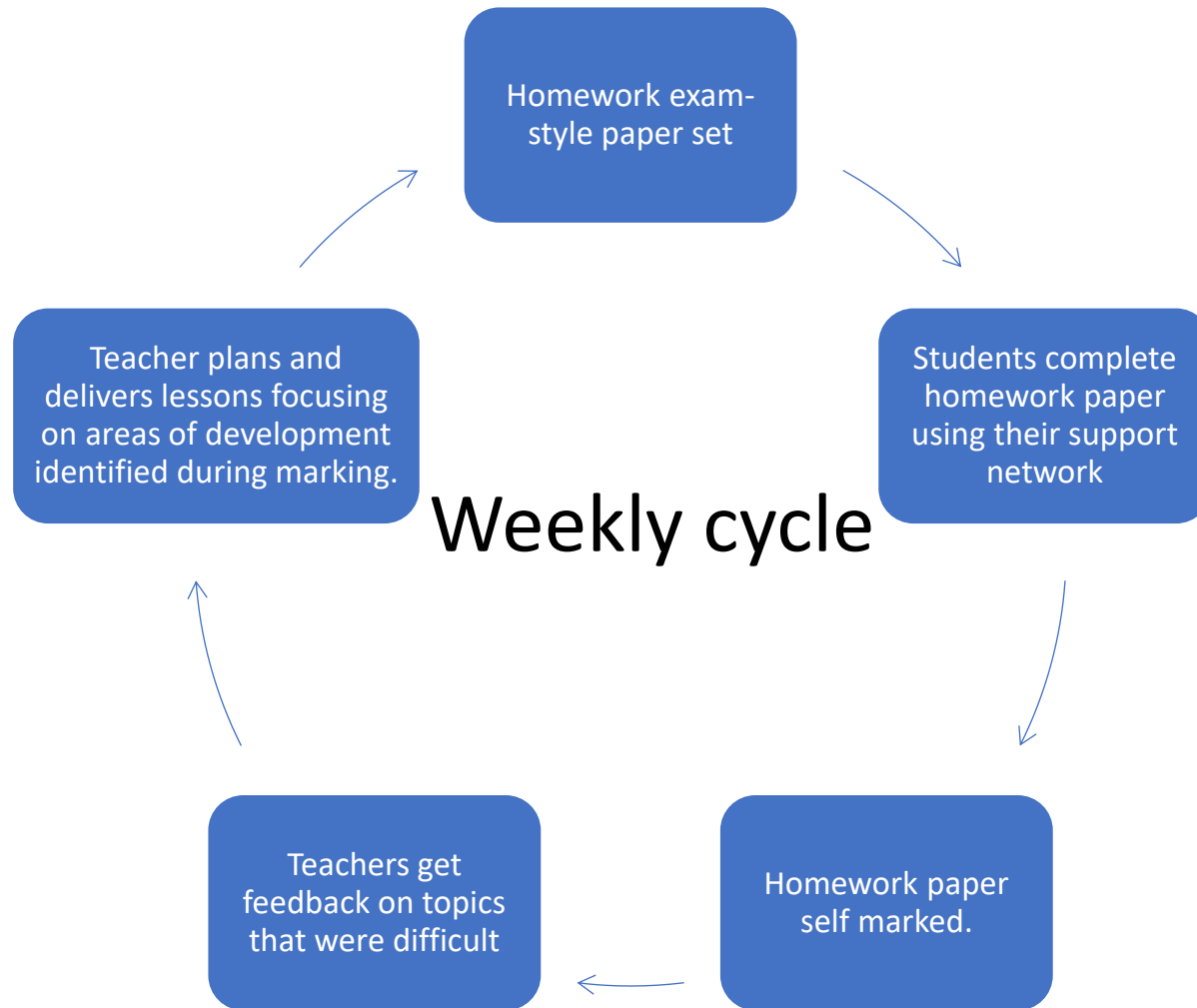


Revision – Tips!



1. They need to revise in a quiet environment.
2. Don't have distractions – turn devices off and put phones away.
3. Homework is geared around revision and revisiting and reviewing learning. These need to be completed with a high level of effort for students to get the most out of them.
4. **YEAR 11 HOMEWORK- ONLY PAST PAPERS- STUDENTS TO COMPLETE AND MARK**
5. Check they have attempted the whole task or, if it is a past paper that they have attempted all the questions. Many leave the longer or trickier questions blank when it is these that are most important for them to practise.
6. Remind them to use their revision guides to help them. That's what they're there for!
7. Encourage students to attend the P6 revision sessions that will be available from their class teachers.

Revision at school



Revision at school

For this **November trials** –there will be **Period 6 sessions** after school to support students in their revision of all areas within science-This will again be differentiated into **Foundation/Higher or Triple sessions**.

There will be a chance to attend Foundation/Higher or Triple sessions of any teacher that is offering a session. STAR Students are invited to attend these sessions

Please ensure that students check Edulink for these sessions as they will need to sign up so we know how many students are attending and can adequately provide resources and seats for them!

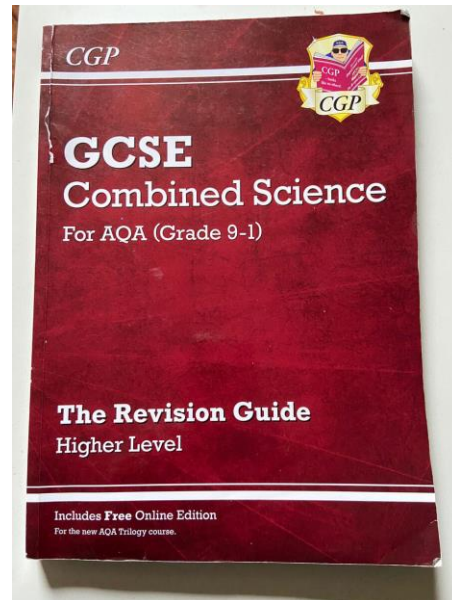
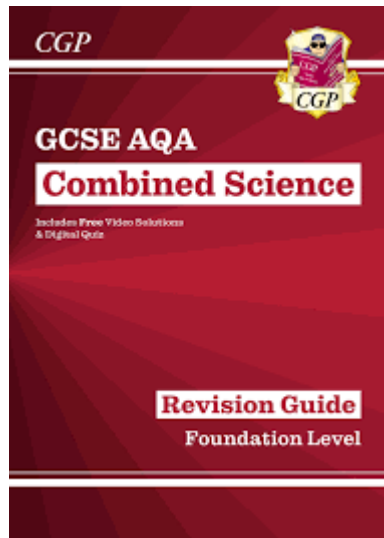
Class teachers might also be offering drop-in sessions.

They can always check with their individual teachers for any help.

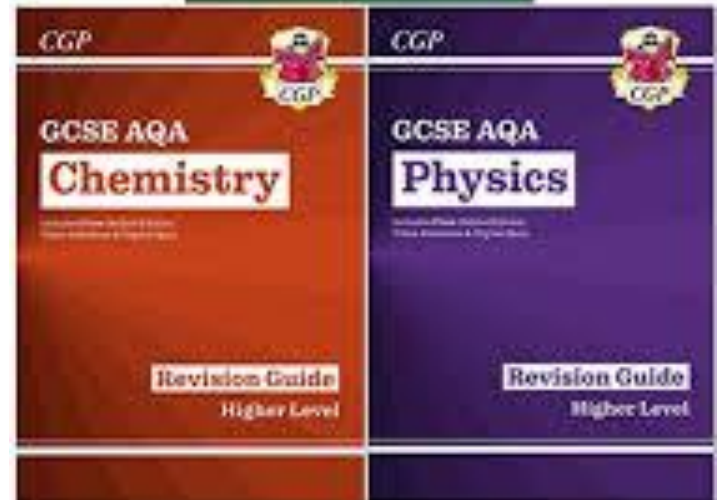
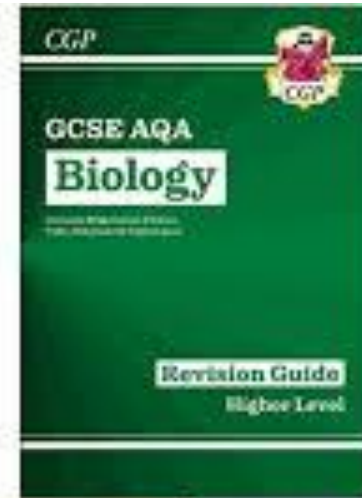
After first trials –teachers will mark and give detailed analysis for students on each of their papers.

Homework will be set on intervention- work on the identified weaker topics.

COMBINED SCIENCE



TRIPLE



Where to find the information

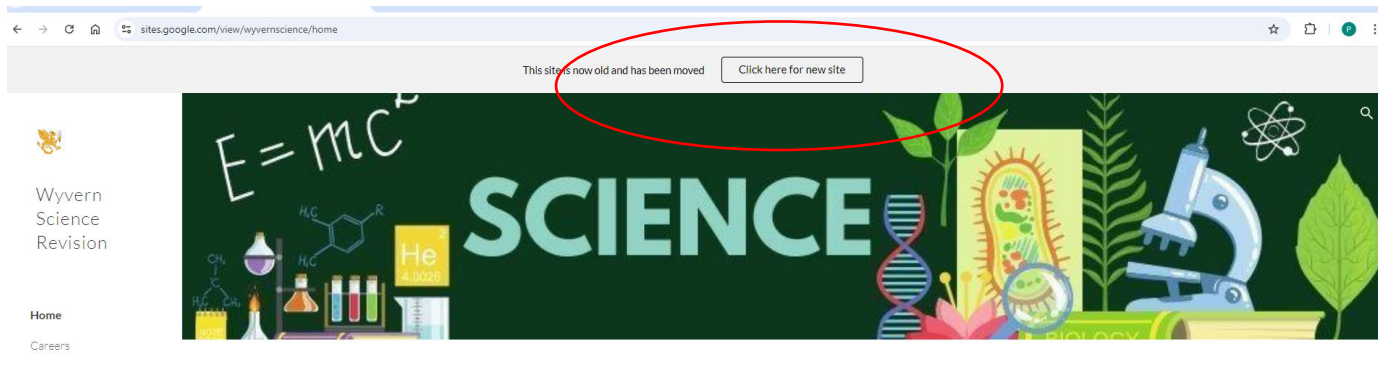
- Revision guides – Combined Science Foundation and Higher and Separate Guides for Triple
- [Wyvern science revision website](#) – full of useful resources, videos, questions revision cards etc- *link to new website have been sent to all year 11s.*

The new website has all the revision mats (with answers), past paper and topic questions, keywords.

- [BBC bitesize](#) – this is a good website to get fundamental concepts.
- [EDUCAKE](#) – question bank full of AQA standardised questions with study guides to support your child.
- [Cognito and free Science lessons](#) also have good videos and resources
- [Your teacher](#) – if your child needs help, make sure they seek it

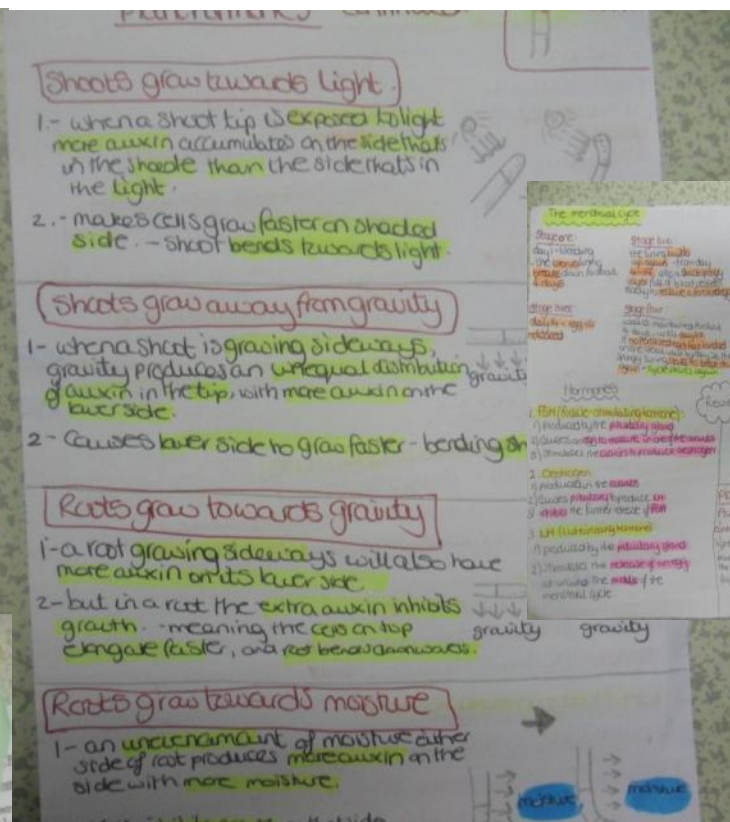
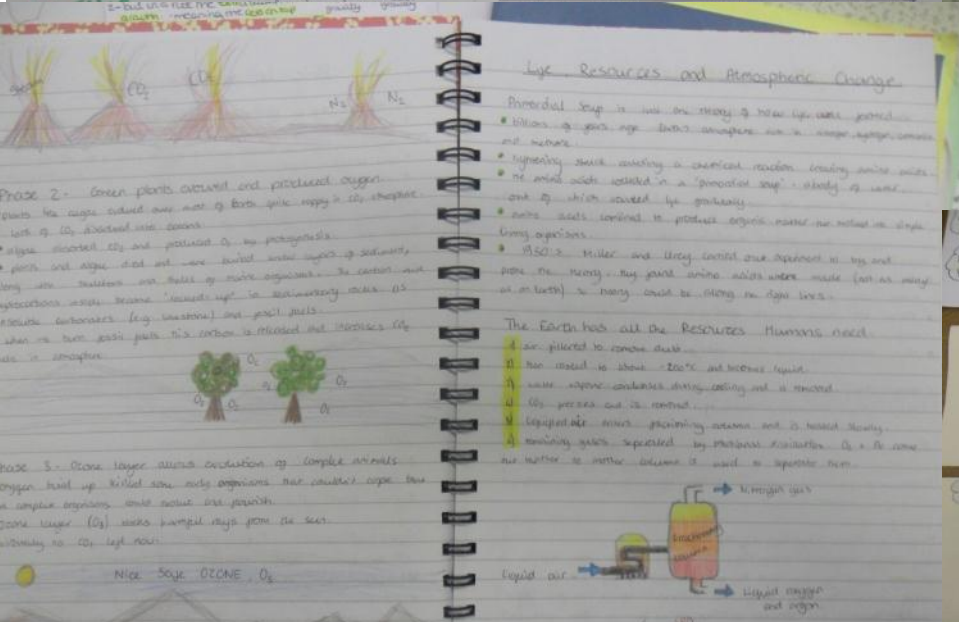
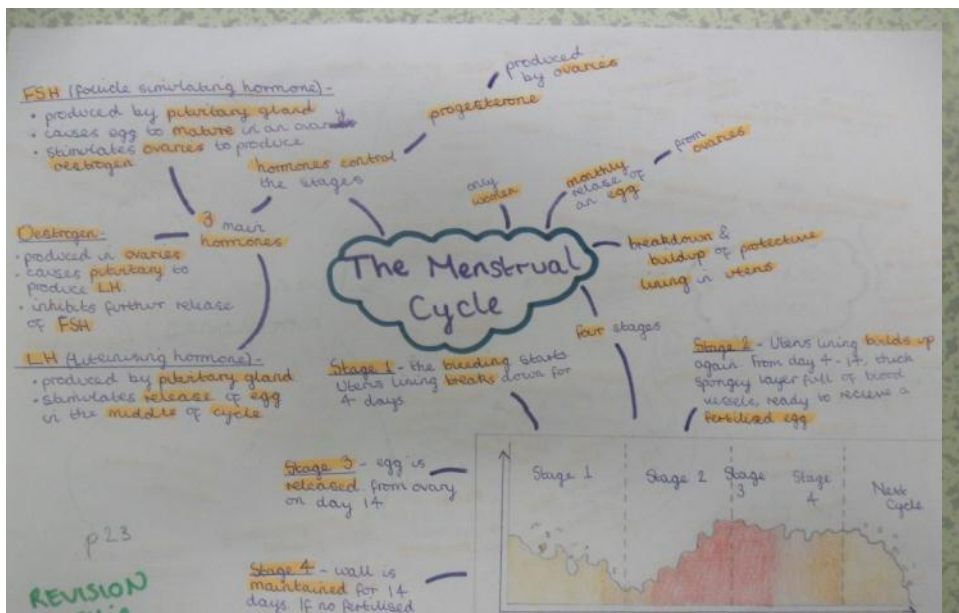
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- Students need to log in using their school email (if off school site they will need to enter their school password too).

Examples of good detailed revision, where students have taken the time to process the content:



Question card

This student didn't find writing notes helpful. She wrote out questions with the answers on the back and every time she got the correct answer, she ticked it so she could see where to spend her time.

What reaction is it?
Mg and HCl will make
What?
✓✓

Electron config
for hydrogen chloride (HCl)
and ammonia (NH₃)?
✓

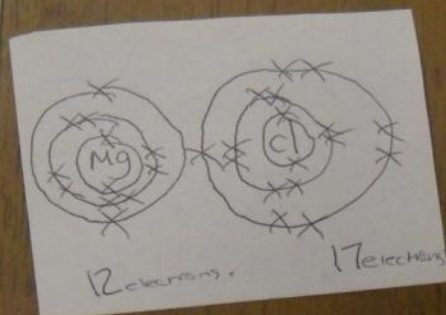
(of a metal?)
✓✓

Explain why graphite
is soft and slippery?
and why it can conduct
electricity?
✓✓✓

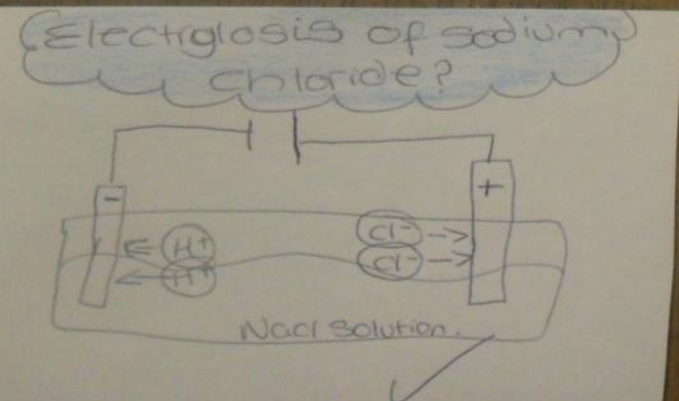
Describe the
atomic structure
of Sodium, Na.
 $^{23}_{11}\text{Na}$?
✓✓

It is a mixture of
metals.
Mixture breaks up the
neat arrangement of
layers, so atoms can
no longer slide over
each other.
pure metal,
ions all same size
in neat layers so don't
slide over each other.

acid = H^+
Alkali = OH^-
✓✓✓



Explain using
 $^{12}_6\text{C}$ and $^{14}_6\text{C}$
What an isotope
is?
✓



When molten
or dissolved in
a solution,
because then
the ions can
move carrying the

Explain why
diamond is hard?

Use post-it notes, strategically placed around your home, to remind you of tricky facts.

Make notes and stick them

Keywords so they might sink in..

e of elements

GRAPHITE delocalised electrons between layers - held very weakly Uses: - electrolysis electrodes - conduct electricity - high melting point Pencil leads - soft layers not strongly held together Lubricator - additive to oil and grease		DIAMOND Strong lines - hard to break up - makes it stronger Uses: Jewellery - colourless, sparkles with the refraction of light Cutting edges - hardest natural substance cuts through near every thing.		FULLERENES Buckminster Fullerene 'Bucky Balls' 60 carbon atoms C_{60} Nano tubes - Properties - semi-conductors - Small - Large surface area - very strong Nano tubes are fullerenes joined together Uses - reinforcing sports items like tennis rackets - industrial catalysts	
Other metals Other non-metals Halogens Inert gases Lanthanides Actinides Trans-actinides Made atoms that exist for less than a second Radioactive element Gas element Liquid element		Nano chemistry - working on a nano-scale = very small ATOMS		Periodic Table 10 11 12 13 14 15 16 17 18 1 2 3 4 5 6 7 8 9 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54	

