GCSE Science

How to do it?!

What do they have to revise for the exams?

Combined Science

B1-B9

C1-C17

P1-P13

10 TD, RB, AT, DEV

Core Practicals

Separate Sciences

Biology
B1-B9

Chemistry
C1-C26

Physics
P1-P15

10AHO and 10CDA

How we do it…

Year 9

B1-B3

C1-C8

P1-P3

Year 10

B4-B7

C9-C13

P4-P9

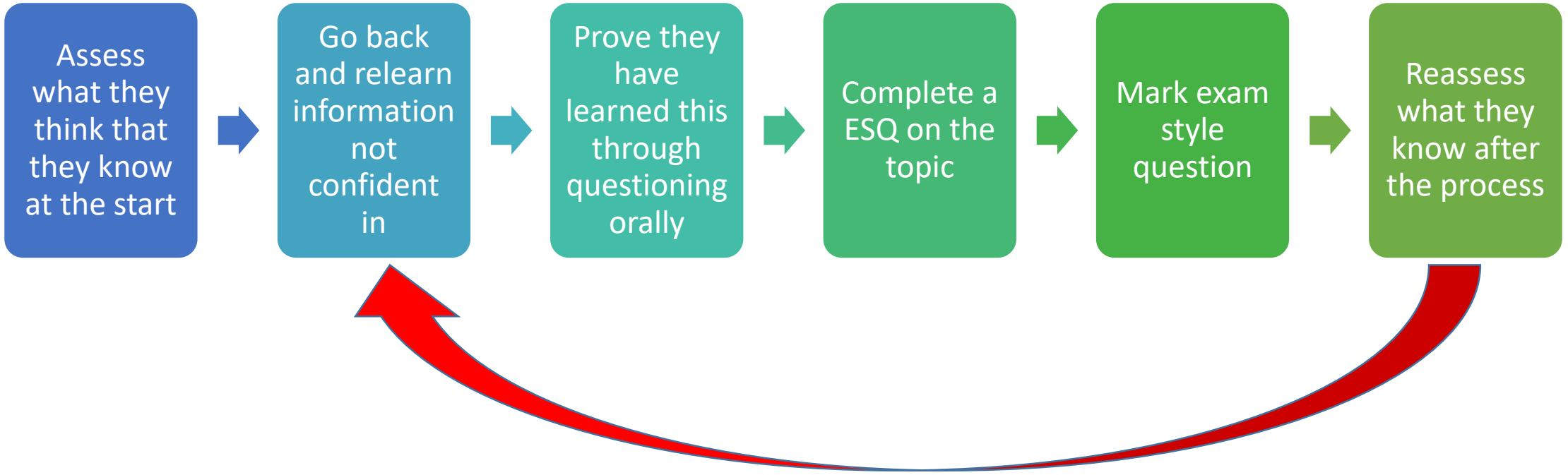
Year 11

B8-B9

C14-17(26)

P10-P13 (P15)

How students should revise in science…



Let’s see if we can get you to remember some information…

Let’s look at a topic…

Students should:		Maths skills
1.1	Explain how the sub-cellular structures of eukaryotic and prokaryotic cells are related to their functions, including: a animal cells – nucleus, cell membrane, mitochondria and ribosomes b plant cells – nucleus, cell membrane, cell wall, chloroplasts, mitochondria, vacuole and ribosomes c bacteria – chromosomal DNA, plasmid DNA, cell membrane, ribosomes and flagella	
1.2	Describe how specialised cells are adapted to their function, including: a sperm cells – acrosome, haploid nucleus, mitochondria and tail b egg cells – nutrients in the cytoplasm, haploid nucleus and changes in the cell membrane after fertilisation c ciliated epithelial cells	
1.3	Explain how changes in microscope technology, including electron microscopy, have enabled us to see cell structures and organelles with more clarity and detail than in the past and increased our understanding of the role of sub-cellular structures	
1.4	Demonstrate an understanding of number, size and scale, including the use of estimations and explain when they should be used	1d 2h
1.5	Demonstrate an understanding of the relationship between quantitative units in relation to cells, including: a milli (10^{-3}) b micro (10^{-6}) c nano (10^{-9}) d pico (10^{-12}) **e calculations with numbers written in standard form**	1b 2a 2h
1.6	*Core Practical: Investigate biological specimens using microscopes, including magnification calculations and labelled scientific drawings from observations*	1d 2a, 2h 3b
1.7	Explain the mechanism of enzyme action including the active site and enzyme specificity	

Students should:		Maths skills
1.8	Explain how enzymes can be denatured due to changes in the shape of the active site	
1.9	Explain the effects of temperature, substrate concentration and pH on enzyme activity	2c, 2f 4a, 4c
1.10	*Core Practical: Investigate the effect of pH on enzyme activity*	2c, 2f 4a, 4c
1.11	Demonstrate an understanding of rate calculations for enzyme activity	1a, 1c
1.12	Explain the importance of enzymes as biological catalysts in the synthesis of carbohydrates, proteins and lipids and their breakdown into sugars, amino acids and fatty acids and glycerol	
1.15	Explain how substances are transported into and out of cells, including by diffusion, osmosis and active transport	
1.16	*Core Practical: Investigate osmosis in potatoes*	1c 2b, 2f 4a, 4c
1.17	Calculate percentage gain and loss of mass in osmosis	1a, 1c 4a, 4c

This one topic of B1

Lots of information that is not easy to take in straight away

Assessing what they know…

B1a Fitness and Health

	I have completed	I have understood	I have revised	Work still to complete
I understand what causes an increase in blood pressure				
I understand what causes a decrease in blood pressure				
I can explain the consequences of high blood pressure				
I can explain the consequences of low blood pressure				
I can explain how diet and smoking can increase the risk of heart disease				
Explain what cholesterol is and how it is measured				
I can explain how narrowed arteries increase the risk of heart attack				
I can explain how a thrombosis (clot) can increase the risk of a heart attack				

Flash cards… Highly effective…

Make flash cards on index or file cards you can purchase in any office supply store in a variety of colours. They can be used to study vocabulary, facts, formulas, and events… virtually any kind of information.

When making flash cards:

1. Write only **one question** along with its answer on each flash card.
2. Write the **question on one side** and the **answer on the other**.
3. Use **point form**.
4. Put information in **your own words**.
5. Add **diagrams** and **examples** to the answer side.

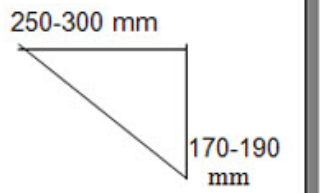
When using flash cards:

1. As you test yourself, divide the cards into two piles: an **"I know it"** pile and an **"I don't know it"** pile.
2. **Test yourself** with both sides of the flash card, once asking the question, and once flipping the cards over and turning the answer into a question.
3. Only stop **practicing** when all of the cards are in the "I know it" pile.
4. **Review** all cards regularly to ensure that you know them all with 100% accuracy for your exam.

Organizing your cards:

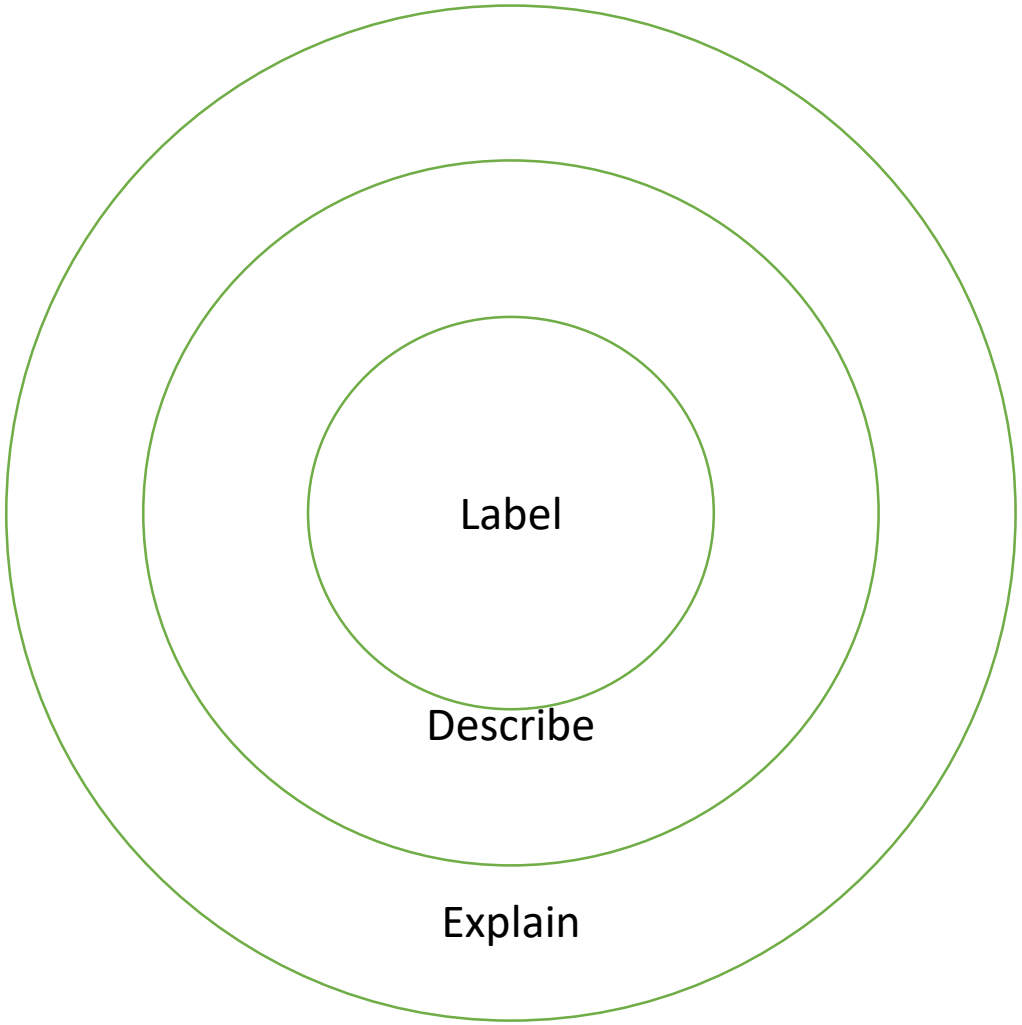
Flash cards will not be helpful if they cannot be found. Once made, it is important to develop a system of organization.

1. Store cards in a **recipe/index card box**. Purchase dividers to organize cards by subject. The NAIT Bookstore sells a portable index cardholder with dividers.
2. Cards can be colour-coded. If you purchase several colours of cards, each subject can be a separate color, or you can use separate colours for vocabulary, facts, formulas, etc.

Front	Back
Common rise and run of a concrete stair?	
Carbohydrates?	• Classified as plants • Starches, sugars, & fiber • Simple (sugar) or complex (starches, fiber) • Supply energy
Canine Parvo Virus?	• Water hose diarrhea with mucus and blood • Sunken eyes • Anorexia • Rapid, weak pulse • Destroyed intestinal villi
What is an expression?	Combining two or more values using some operation: add, multiply, greater than etc. Value Value Value } +, x, >…

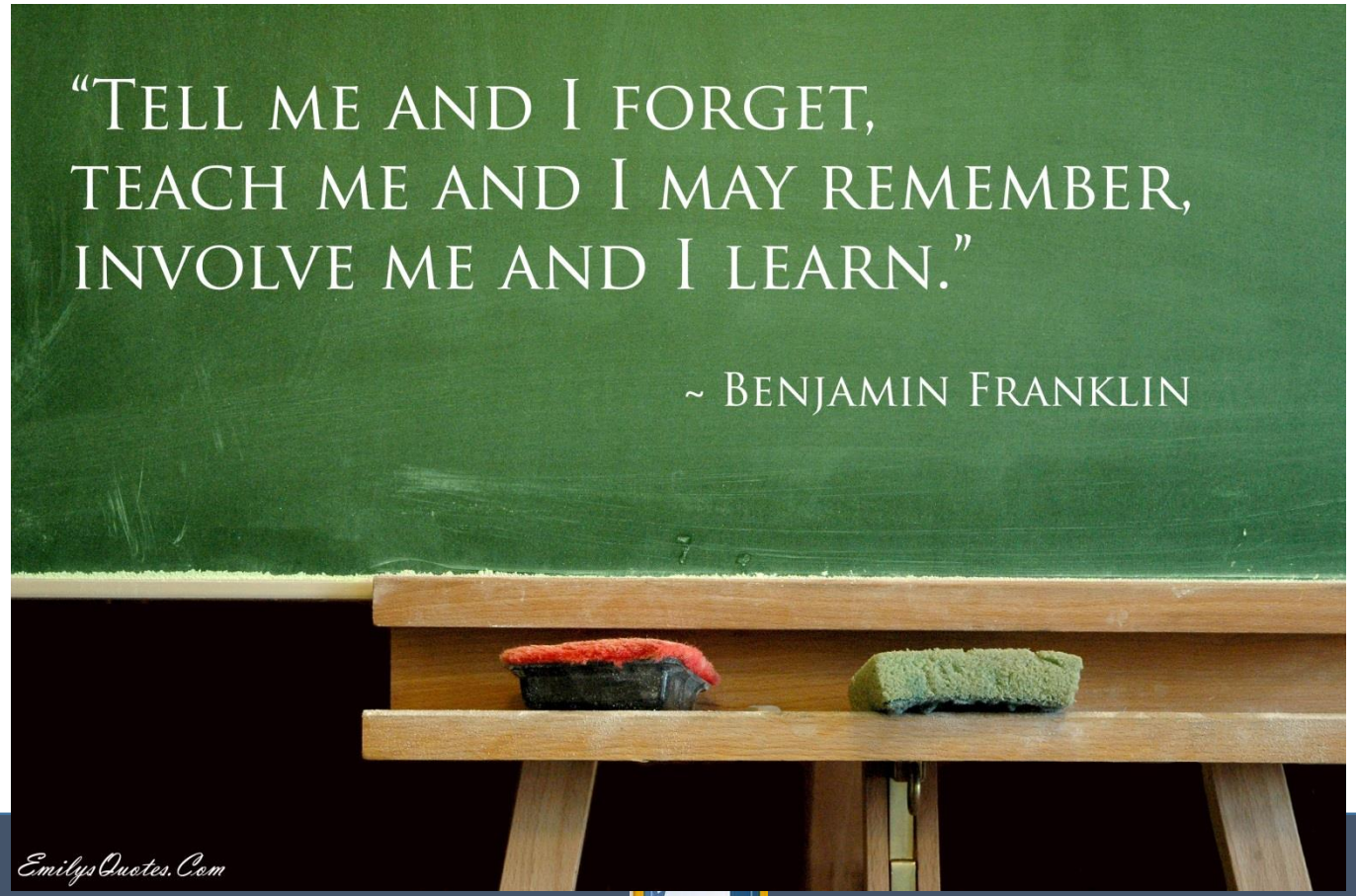
Graphic organisers….

Rearranging information into a visual format is very powerful…The process of making it is as valuable as the revision tool to use afterwards.



Teach it!

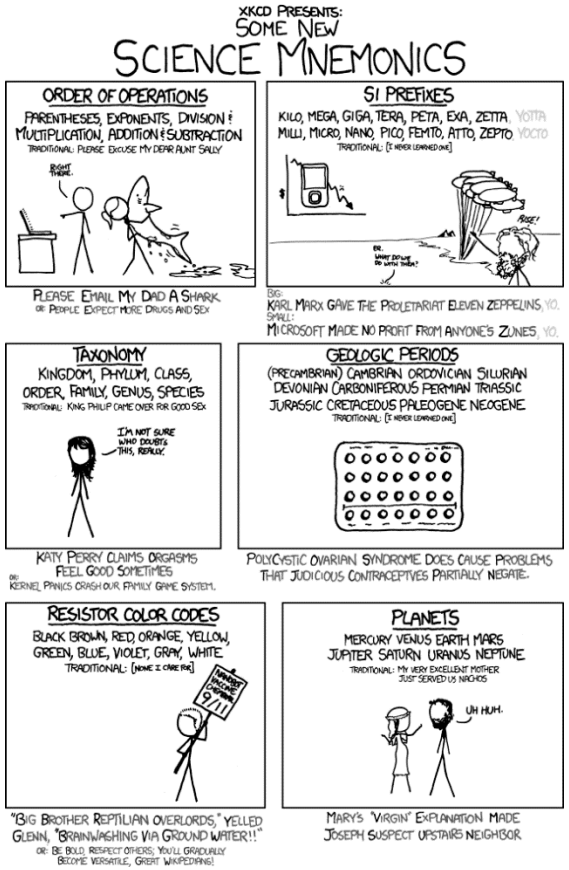
Get students to teach you – preferably in a practical way…..
Once they have covered a topic get them to turn it into a quiz, a gap fill exercise, a diagram with missing labels, a jumbled up timeline. They then can test it out on you….

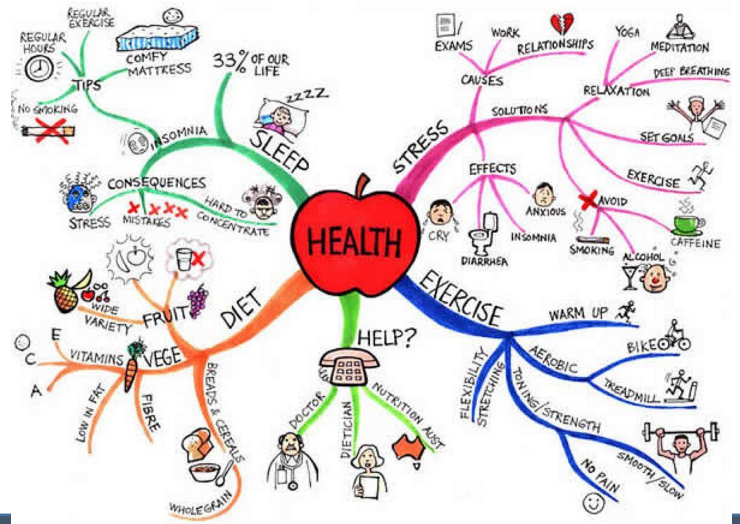


The lift test…

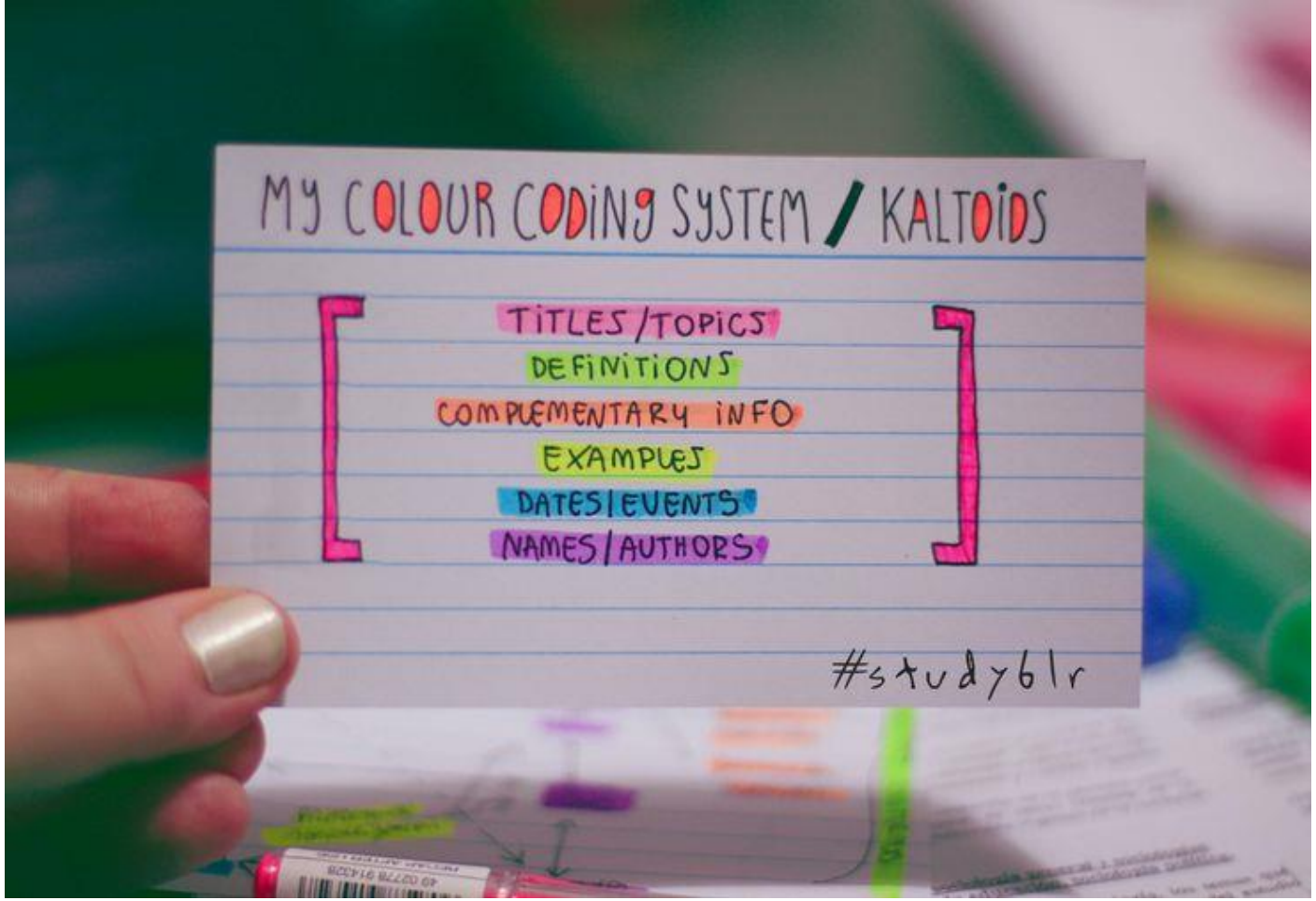
Prepare a 5 minute presentation on a topic ready to present at a meeting…. But when you get to your meeting they tell you they are in a rush….

You have 45 seconds to explain a principle to someone in the lift…. Before it reaches the ground floor… Can you summarise it fast!





Mind mapping, mnemonics and flow charts



Get ready for colour coding and post-it-note mania!

Finally……Exam papers and Mark Schemes….

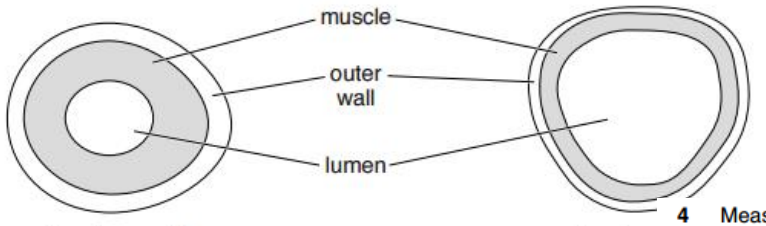
If you don’t get provided them but teachers… go and get them yourself and make students use them!
Completing practise questions in timed conditions… and then marking them yourself is BRILLIANT preparation….
Plus the mark schemes can also be used to add detail to notes on topics from class…

edexcel

Exam Style Questions

3 Blood vessels are tubes that carry blood.

The diagram shows cross-sections through blood vessels **A** and **B**.



blood vessel **A** blood ve

(a) (i) The diameter of the lumen of blood vessel **A** is 1 cm in real

Calculate the cross-sectional area of the **lumen** of blood ve

Use the formula, area = πr^2 (where π is 3.14).

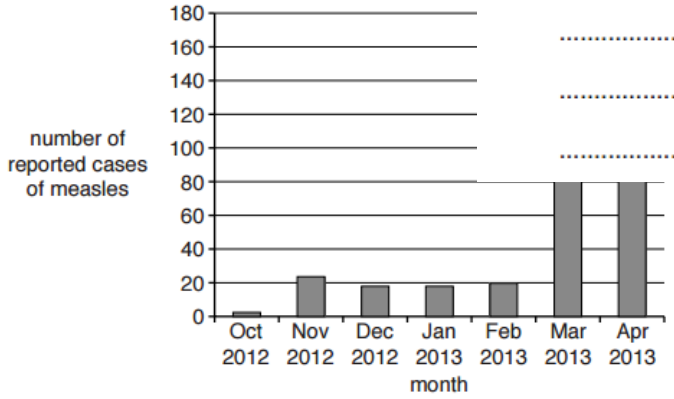
Show your working. Give your answer to two decimal place

cross-sectional area of **A** = ...

4 Measles is a very infectious and potentially deadly disease.

It is caused by a virus.

(a) The graph shows the number of measles cases reporte 2012 and April 2013.



(i) Calculate the percentage increase in reported cases of measles in South Wales between February and April 2013.

Show your working.

..... % **[2]**

(b) Leo is 40 years old. He is in hospital recovering from a heart attack.

His brother, Samson, is 64 years old. He has never had a heart attack.

Explain what causes a heart attack and suggest reasons why Leo has had a heart attack but his much older brother has not.

The quality of written communication will be assessed in your answer.

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..... **[6]**

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How effective are different strategies?

- **Summarising** - writing summaries of texts - **LOW**
- **Highlighting/underlining** - **LOW**
- **Keyword mnemonics** - choosing a word to associate with information - **LOW**
- **Imagery -** forming mental pictures while reading or listening - **LOW**
- **Re-reading** – **LOW**

- **Elaborative interrogation** - being able to explain a point or fact - **MODERATE**
- **Self-explanation** - how a problem was solved – **MODERATE**
- **Interleaved practice -** switching between different kinds of problems - **MODERATE**

- **Practice testing** - Self-testing to check knowledge - especially using flash cards - **HIGH**
- **Distributed practice -** spreading out study over time – **HIGH**
- **Exam Style Questions –** applying knowledge to new situations - **HIGH**

Parents – what can you do to help?

Reward effort rather than results:

Parents all want to see their children do well and it can be tempting to offer attractive 'incentives' for them to do so. However, offering specific rewards for grades may add extra pressure onto your child at an already stressful time. Why not think about offering rewards for revising/working hard instead?

Get involved:

Offer to test your child on what they've revised each day (or ask them to **teach you** – a great way of consolidating learning). Encourage them to put up **revision posters**, **diagrams**, **post it notes** around the house. Acknowledge that this time in their life is really stressful but you are here to hel

Be a supporter, not a nag!

Praise them when they are working hard and tell them how impressed you are by their organization. If they have fallen off track with their revision, then don't judge – ask how they plan to solve the problem and offer your support.

Do whatever you can to help – whether that means making endless cups of tea whilst they revise, or sending them to bed when they look tired!

Revision Guides

Letters for revision guides are available at the front…