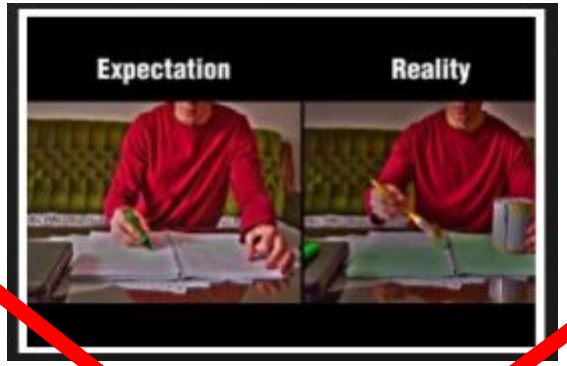
1. How do you revise?
2. *Why* do you revise this way?
3. Does it work? How do you know?

DON'T JUST READ AND HIGHLIGHT YOUR NOTES!!!

You need to have **THOUGHT** about something (not just read/highlighted/copied it) if you are going to remember it!!!!!!

Ineffective study methods

Just reading notes

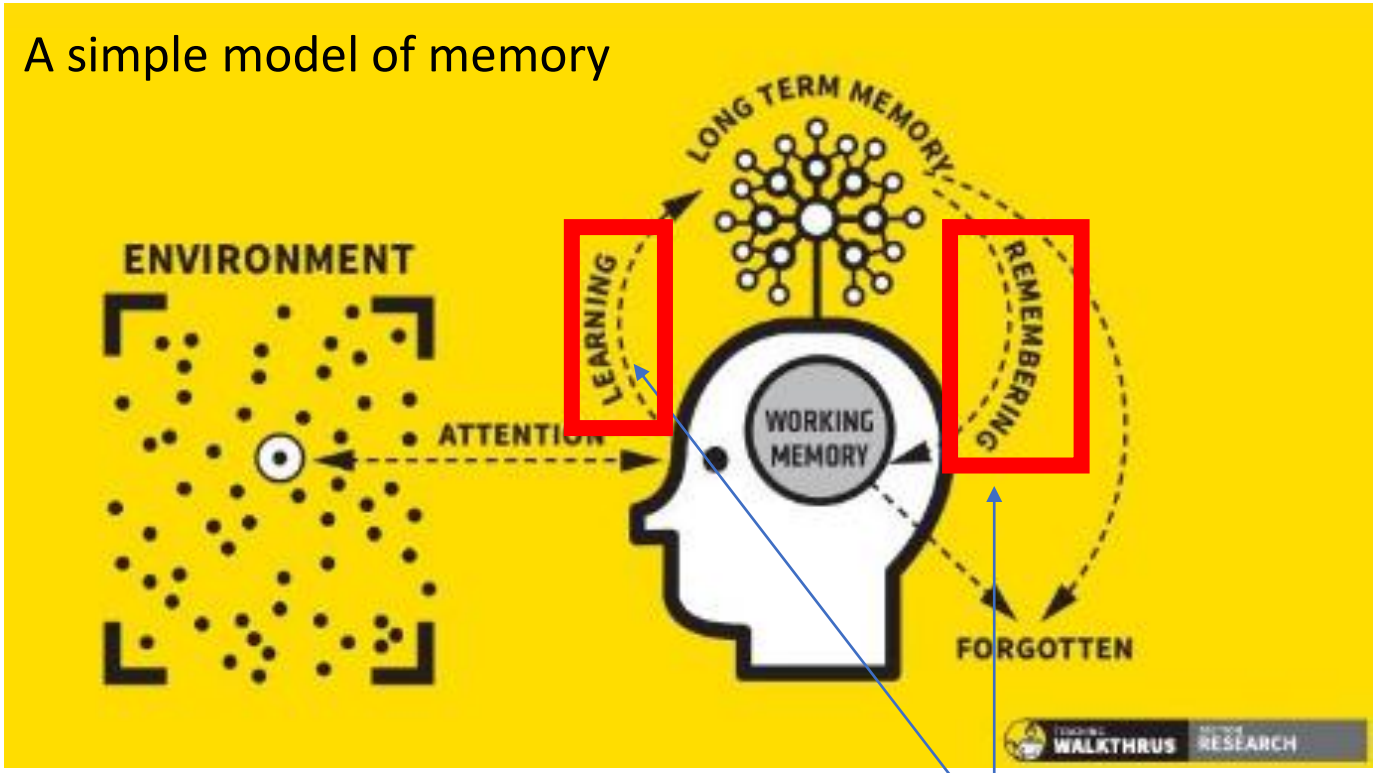


Just highlighting notes

Long study periods

Just studying before an exam/cramming

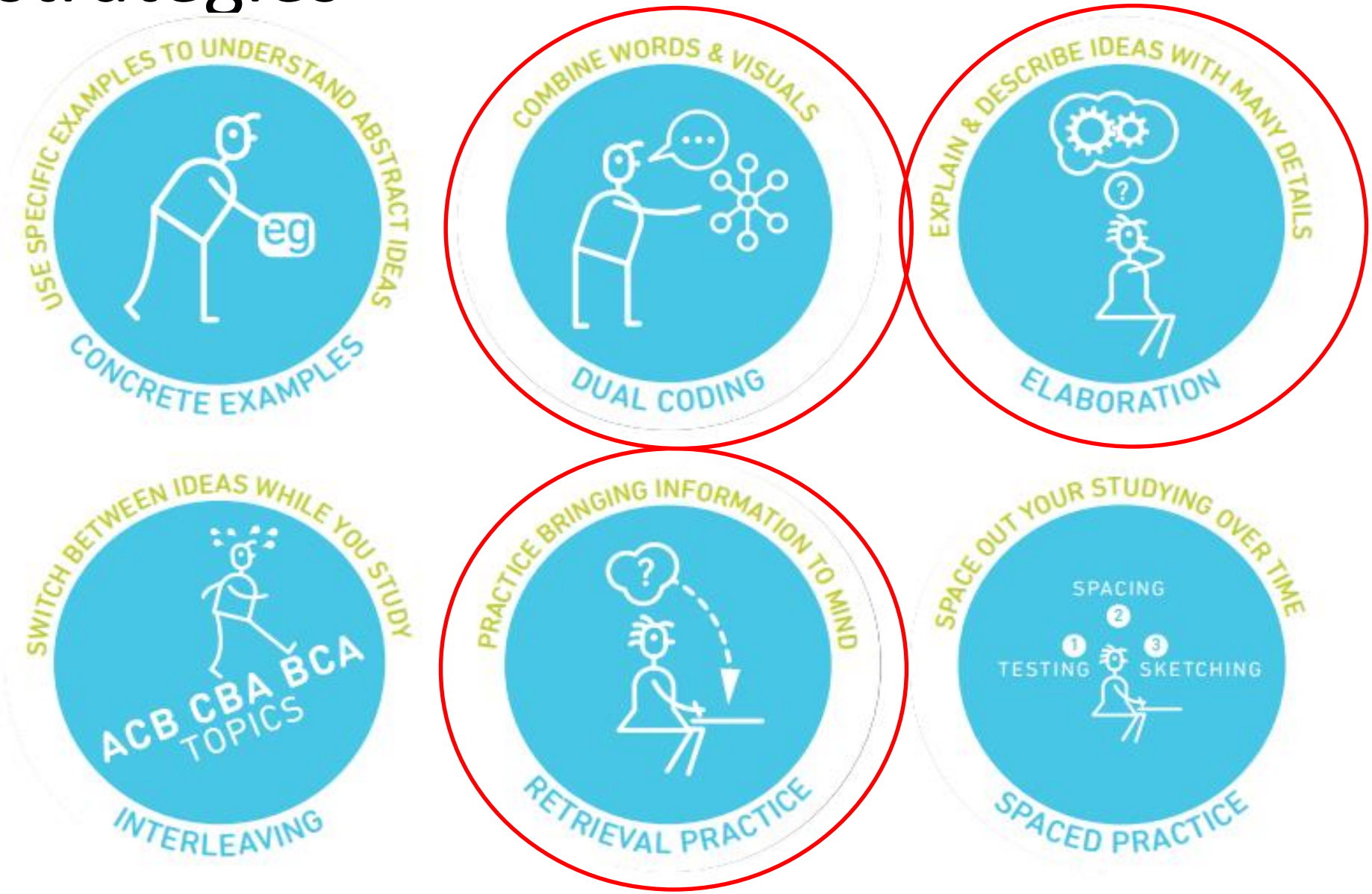
Luckily, we know a lot about the brain and how it learns that we didn't only a few years ago…….



This is the bit we are trying to improve when we revise. Putting information in long term memory **and then getting it back** again when it matters!!

So, what **should** you be doing?

The 6 most effective study strategies



The 6 most effective study strategies

https://www.youtube.com/watch?v=CPxSzxylRCI&t=11s

The 6 most effective study strategies

Spaced practice	Start planning early for exams and set aside a little bit of time everyday. Five hours spread out over two weeks is better than the same five hours all at once. This is one of the most effective revision strategies. The ideal is 20-30 minutes per session.
Interleaving	Interleaving is a process where students mix & combine multiple subjects & topics while they study in order to improve their learning. Rather than studying one topic for a long time before moving to another. This leads to better long-term memory.
Elaboration	This involves explaining and describing ideas in lots of detail, asking further questions about what you are learning and making links to help you connect new information with what you already know.
Concrete examples	Concrete examples involves finding & using specific, real-life examples to help develop & deepen understanding of abstract ideas. Abstract ideas can be difficult to understand & explain. Our memories find it easier to remember concrete examples better than abstract information.
Dual coding	Dual coding is the process of combining verbal materials with visual materials. There are many ways to visually represent materials, such as with infographics, timelines, cartoon/comic strips, diagrams and graphic organisers.
Retrieval practice	Through the act of pulling information out from your long term memory (retrieval), our memory for that information is strengthened and forgetting is less likely to occur. We are more likely to remember it when we need to.

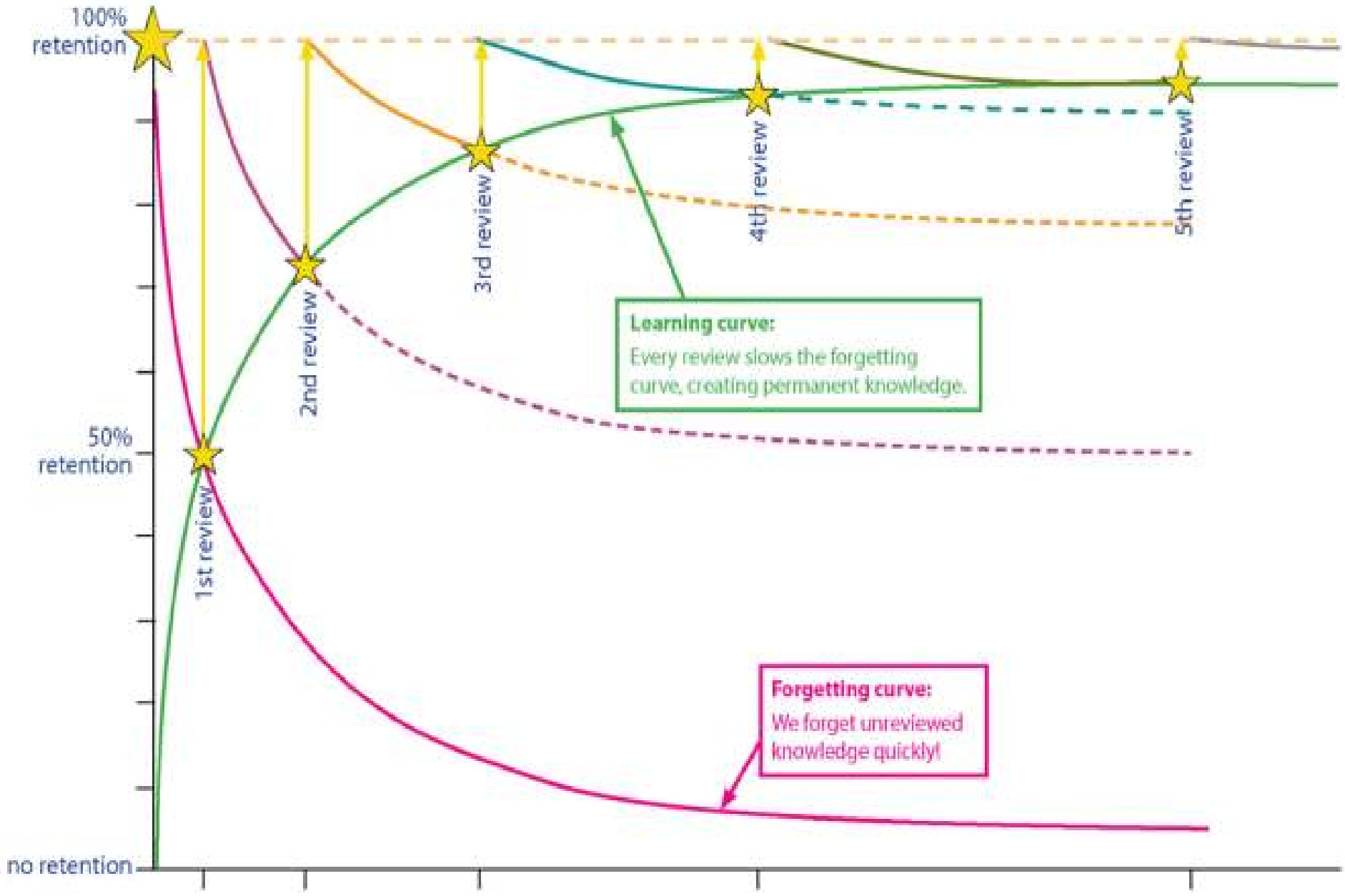
Why?

'Using your memory shapes your memory'

Retrieval practice

The act of recalling learned information from memory (with little or no support) and every time that information is retrieved, or an answer is generated, it changes the original memory to make it STRONGER!

Interrupting forgetting



What is your address?

High retrieval strength

High storage strength

Not all retrieval practice is equal

Cued vs free recall

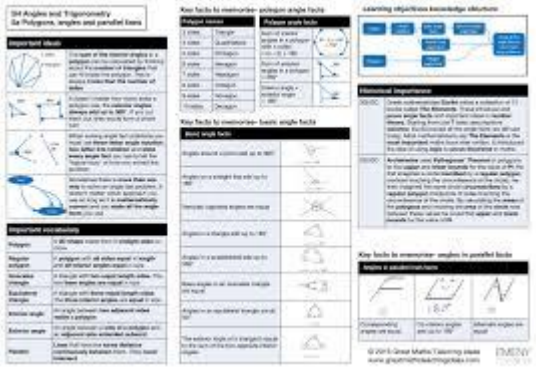
- Cued recall can be useful, but can create the illusion of knowing in learners. Actually learning less in the long-term.

- The struggle of free recall is a learning event.

What?

What could you for retrieval practice?

Knowledge organisers

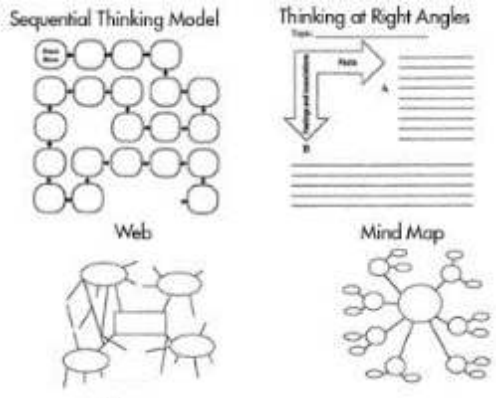


Flash cards

Brain dumps

Cornell Notes

Graphic organisers/ mind maps



Online/Home-made quizzes

Some useful resources

The Cornell Note-taking Method

Topic:	
Recall cues	**Notes:**
Summary	

Topic: Weimar Republic (WR) in 1923 — Stresemann

Recall cues

What crisis did the WR suffer in 1923?

What did this mean to the average citizen?

What prompted this crisis?

Name 4 things Chancellor Stresemann did that helped overcome this crisis?

What effect did each of these have?

Topic: Covalent Bonding

Recall cues

In covalent bonding, electrons are ....?

This results in each atom involved achieving a ....

Between what elements are covalent bonds formed?

What is a covalent bond?

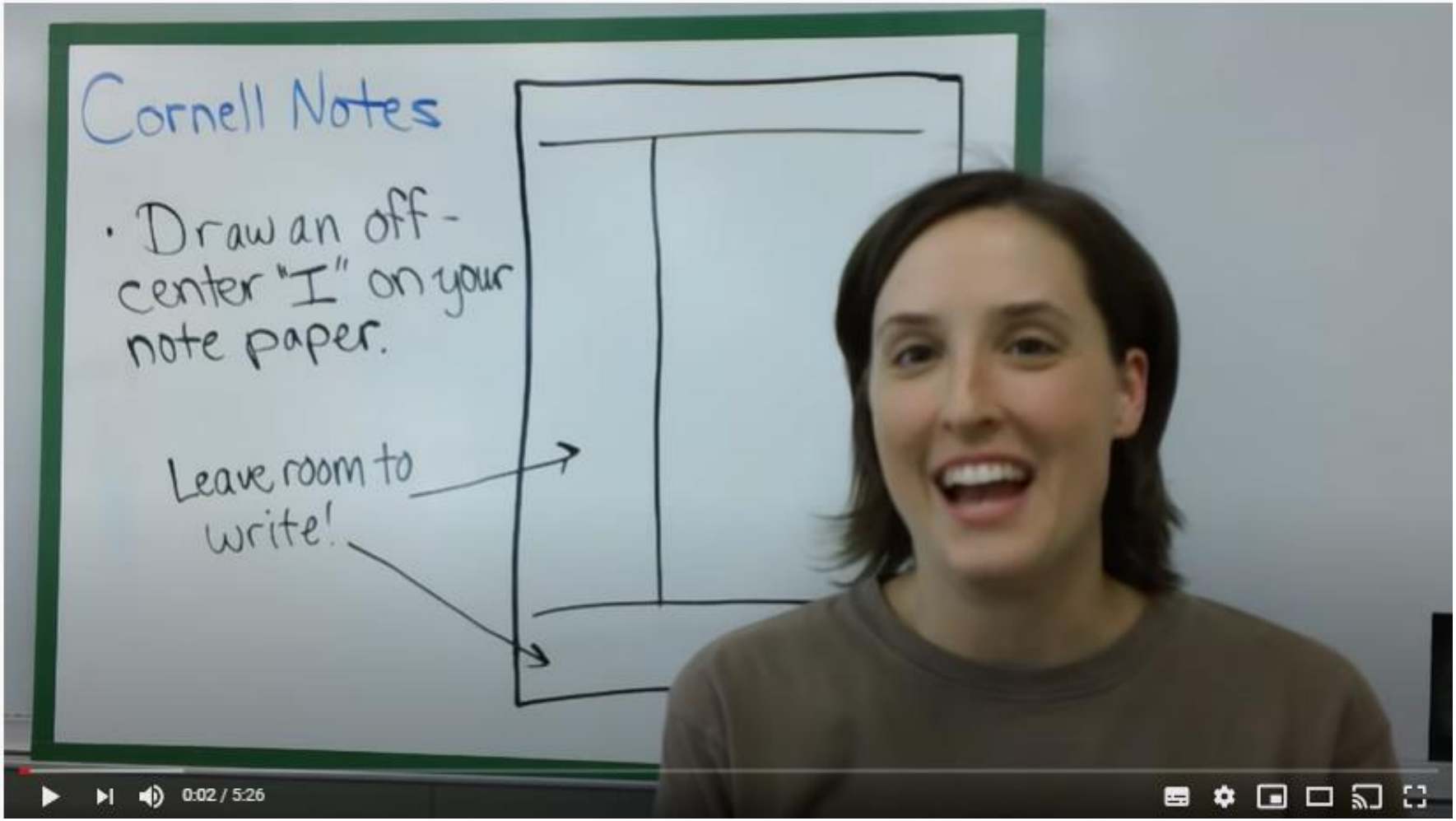
How do work out how many covalent bonds an atom has?

Draw dot-and-cross diagrams for:

- NH_3
- N_2
- CO_2
- H_2O
- CH_4

How to take Cornell notes……

https://www.youtube.com/watch?v=WtW9IyE04OQ&feature=youtu.be



Flashcards are great, but most people use them wrong!!!!!!!

Powerful Flashcards

1) Retrieve (don't cheat!)

2) Re-order (shuffle and interleave)

3) Repeat (at least 3 times)

*Just like lather, rinse, repeat!

Don't flip over too early. Write down the answer or say it out loud *before* flipping the card over.

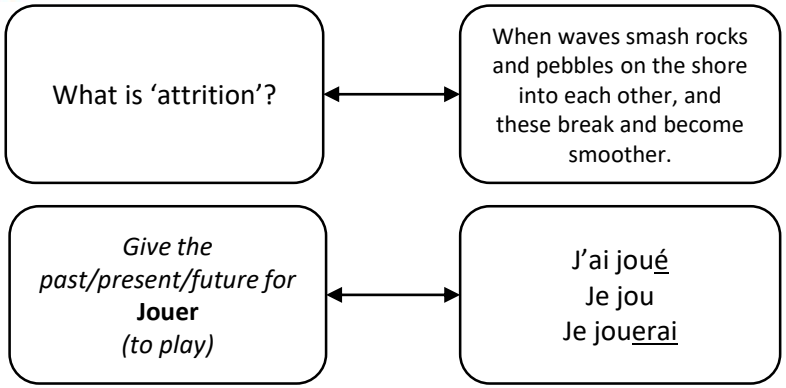
Mix up closely related topics

Keep cards in their deck until you've **correctly retrieved it three times**.

Flashcards – testing not summarising

Making good flashcards

- One side of the flashcard should be a single question and its answer on the reverse
- Select the most important information to go on each flashcard. You could use topic checklists or bolded terms in your study guide to help you choose.
- Break complex concepts down so that they cover multiple cards.
- Use drawings to illustrate answers.



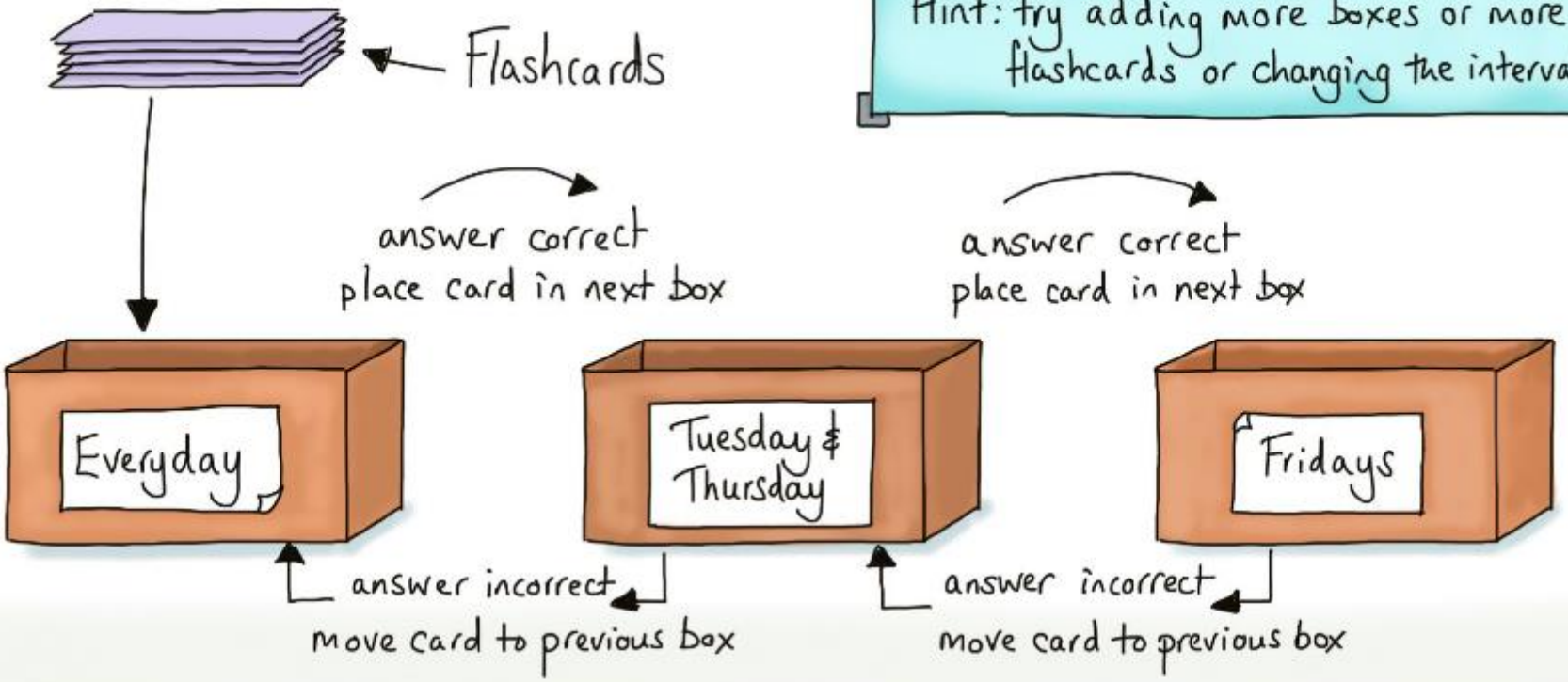
Using flashcards

- Say your answer out loud and not just in your head. It's very important you are fully committed to your answer. Even better would be to write your answer out as this is what you would have to do in an exam.
- Use them both ways – look at the answers and say what the question is.

LEITNER Flash card method

@ImpactWales

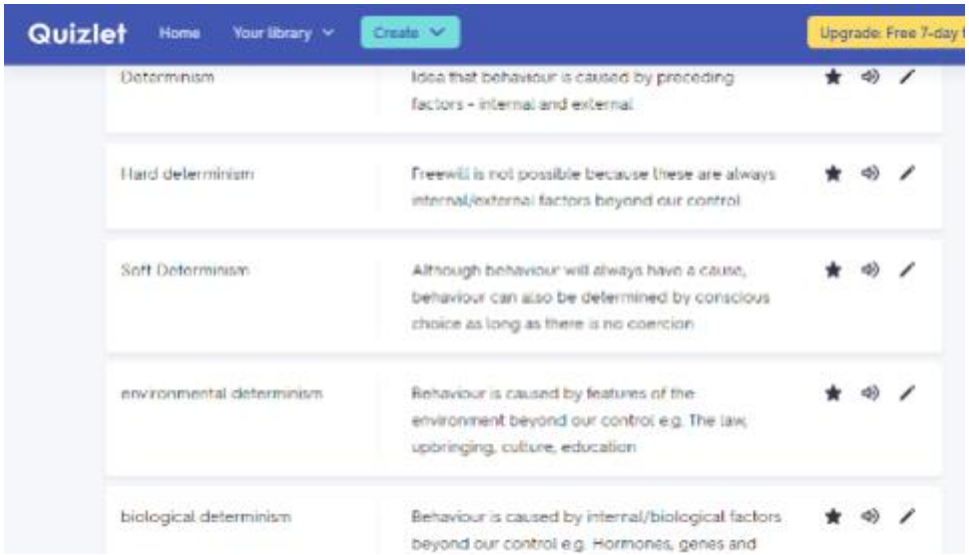
Hint: try adding more boxes or more flashcards or changing the intervals



An effective use of flashcards to prompt & recall learning using spaced practice proposed by Leitner in the 1970s. It focuses on the proficiency of recall of the learner. Information which is easily recalled has a longer time lapse before the next recall opportunity.

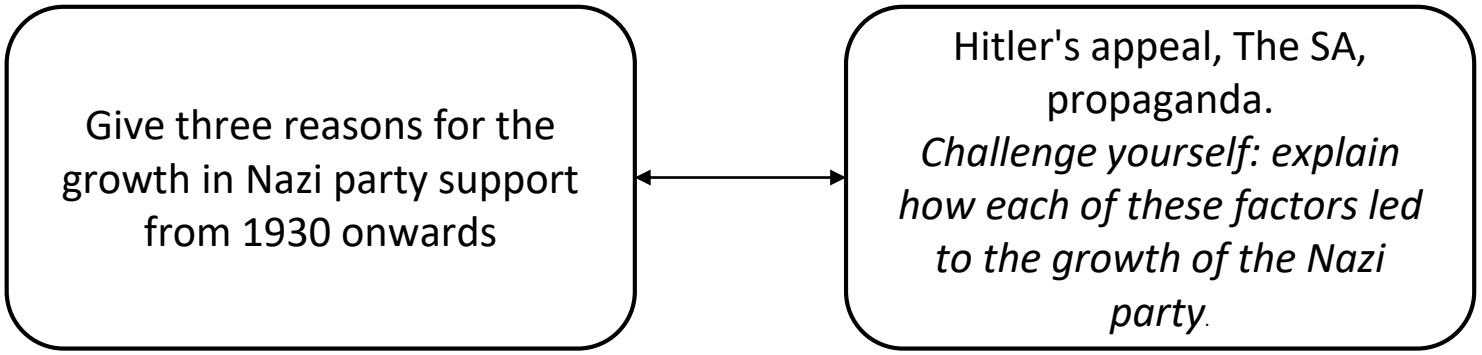
Online Flashcards:

- You can test yourself anytime and anywhere.
- You can add photos, add lots of text, organise folders per subtopic, easy to edit.
- Write function gives you the description and you test your knowledge by writing the key term. It saves progress so if you can't get through the whole stack then you can jump back in.
- Or you can get ready made ones



Flashcards – Making Meaning

- Ask yourself questions about individual cards.
  - What else is this related to?
  - Why is this important?
  - How would I apply this information? Everyday examples?

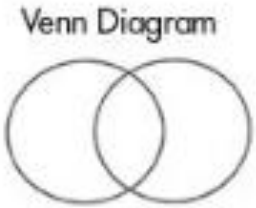


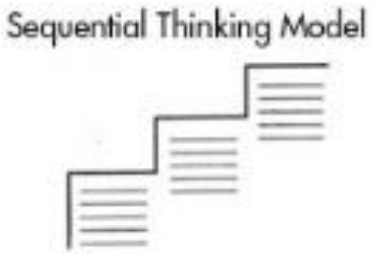
- Group cards together in themes. Taking this additional step forces you to ask yourself 'Which cards have something in common with others?'. Also, this serves as a form of chunking, which helps you to remember information together instead of separately.

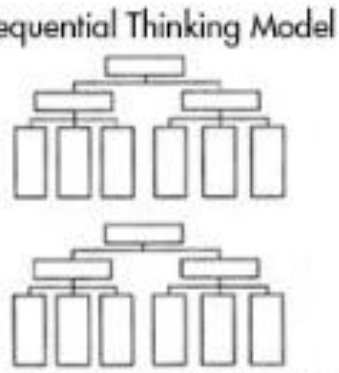
- Create a mind map with the cards. Explain all the connections you see between individual cards and between groups of cards. A related strategy is to use yarn or string to literally connect cards together.

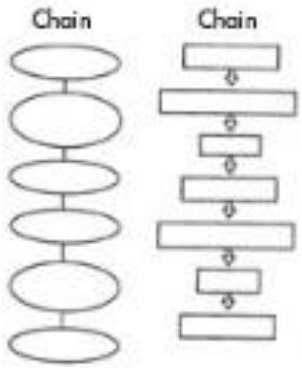
Graphic organisers

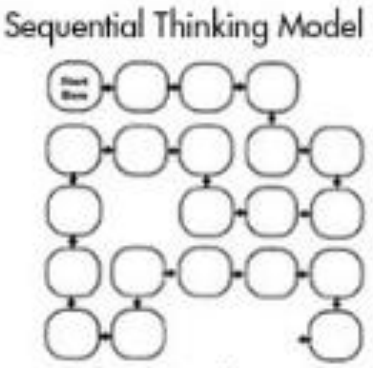
These are good to help you organize your revision topics, making meaningful links and connections (in cognitive science, this is labelled the '**generation effect**').

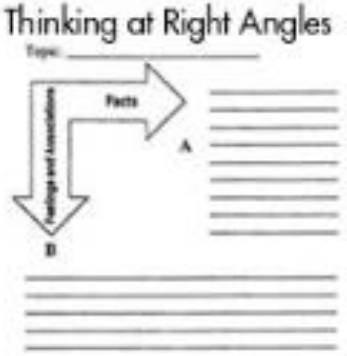


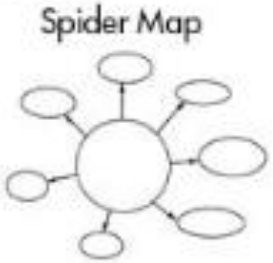


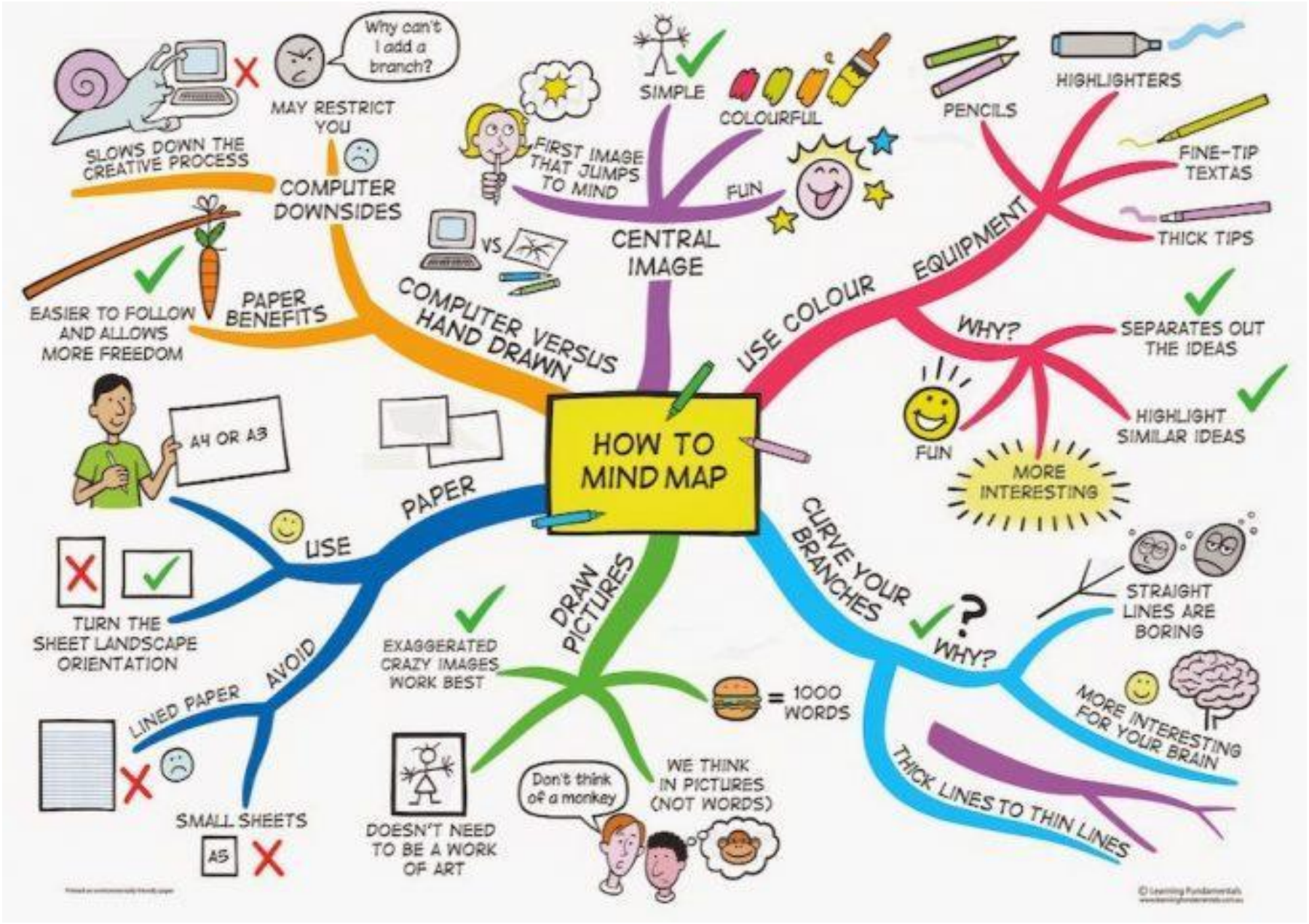











HOW TO MIND MAP
CENTRAL IMAGE
SIMPLE
COLOURFUL
FIRST IMAGE THAT JUMPS TO MIND
FUN
VS
COMPUTER VERSUS HAND DRAWN
COMPUTER DOWNSIDES
Why can't I add a branch?
MAY RESTRICT YOU
SLOWS DOWN THE CREATIVE PROCESS
PAPER BENEFITS
EASIER TO FOLLOW AND ALLOWS MORE FREEDOM
USE COLOUR
EQUIPMENT
PENCILS
HIGHLIGHTERS
FINE-TIP TEXTAS
THICK TIPS
WHY?
SEPARATES OUT THE IDEAS
HIGHLIGHT SIMILAR IDEAS
FUN
MORE INTERESTING
PAPER
USE
A4 OR A3
TURN THE SHEET LANDSCAPE ORIENTATION
AVOID
LINED PAPER
SMALL SHEETS
A5
DRAW PICTURES
EXAGGERATED CRAZY IMAGES WORK BEST
= 1000 WORDS
DOESN'T NEED TO BE A WORK OF ART
Don't think of a monkey
WE THINK IN PICTURES (NOT WORDS)
CURVE YOUR BRANCHES
WHY?
STRAIGHT LINES ARE BORING
MORE INTERESTING FOR YOUR BRAIN
THICK LINES TO THIN LINES

P1/2

Centripetal Force

A force which acts on a body moving in a circular path and is directed towards the centre around which the body is moving

Momentum

$P = m \times v$

The quantity of motion of a moving body measured as a product of mass and velocity

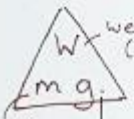
Stopping Distance

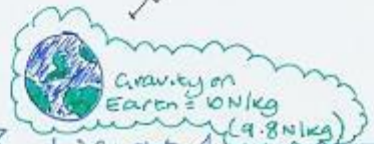
Speed

Braking Distance
- Brakes
- Road condition
- Tyres
- Friction
- mass of vehicle

Thinking Distance
- music / phone
- Distraction
- people
- medication
- Age
- Alcohol
- Drugs

Weight





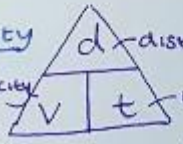
$W = m \times g$

Weight is the amount of force acting on an object.

Quantities

- **Scalar** — Has magnitude (size) but no specific direction. e.g Speed.
- **Vector** — Has both magnitude and direction. e.g Velocity.

Velocity



Velocity = Speed in a named direction

Speed

- Average speed = over entire journey
- Instantaneous = Snap shot.

Acceleration

To increase in speed.

$a = \frac{(v-u)}{t}$

- a = Acceleration m/s^2
- v = new velocity (m/s)
- u = initial velocity (m/s)
- t = Time taken (s)

$(\text{final velocity})^2 - (\text{initial velocity})^2$

$V^2 - u^2 = 2 \times a \times x$ (x = Distance (m); a = acceleration (m/s^2))

Laws

Newtons Second Law

Objects with unbalanced forces will:
- Accelerate in direction of force

$F = Ma$

Newtons first Law

Objects with balanced forces acting on them will:
- stay at rest
  or
- move at constant speed.

Newtons 3rd Law

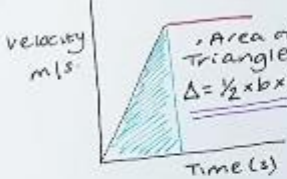
For every action there is an equal and opposite reaction.

Average speeds

- Walking = 1.4 m/s (5km/h)
- Running = 100m per 27sec
- Cycling = 15.5km/h.
- Wind = 9.4 knots
- Sound = 331.2 m/s.

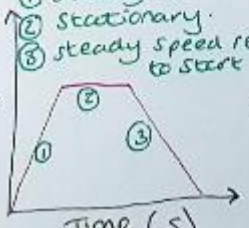
Motion Graphs

To calculate m/s^2 of sloping line

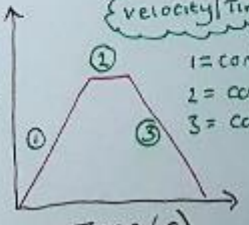


Distance / Time

1. steady Speed
2. Stationary.
3. steady speed returning to start



Velocity / Time

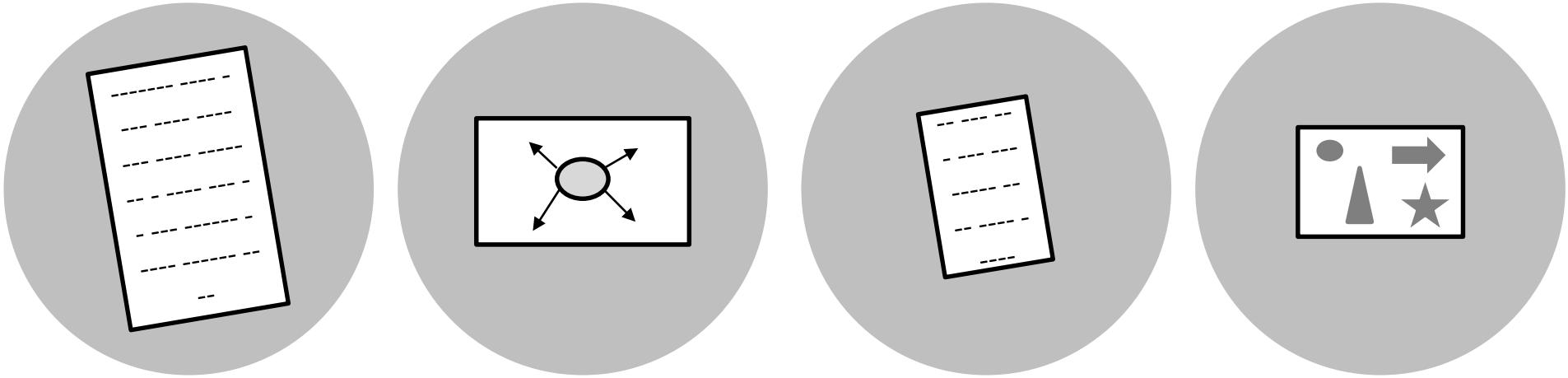


1 = constant acceleration.
2 = constant velocity
3 = constant deceleration.

How to mind map

https://www.youtube.com/watch?v=e67gvI0Xu3g&t=1s

Strategy: **Folding Frenzy:**



Fold

Fold

Turn

Notes:
Write on one side of an a4 page – keywords, definitions, summarising information, using symbols and diagrams.

Graphic organiser:
Create a graphic organiser on an A5 side of the paper. Represent the most important aspects, show links.

Flashcard:
Write on one A6 side of the sheet – 5-6 summary sentences, highlighting the keywords.

Symbols:
On the last A6 side – draw symbols to help you remember.

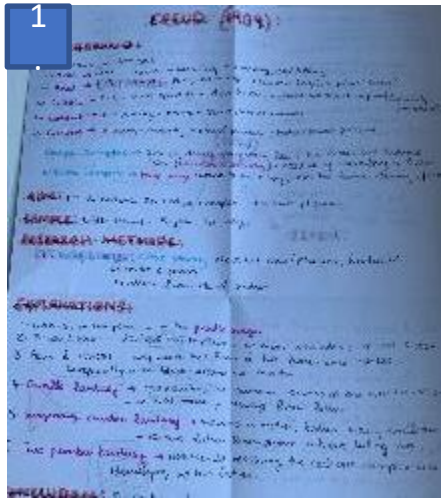
What are the benefits of folding frenzy?

- **Repeated retrieval practice –** revisiting the same information multiple times.
- **Utilising different formats** – e.g. notes, mindmap, flashcard, symbols.
- **Dual coding** – brain can use different channels at once (written word (sound – inner voice) and vision).
- At a later date you can just use the symbols to see how much you can remember, check and identify what you have forgotten.

Folding frenzy:

- The folding frenzy stages can be completed at different times rather than all in one go – **spacing** your revision is important.

1



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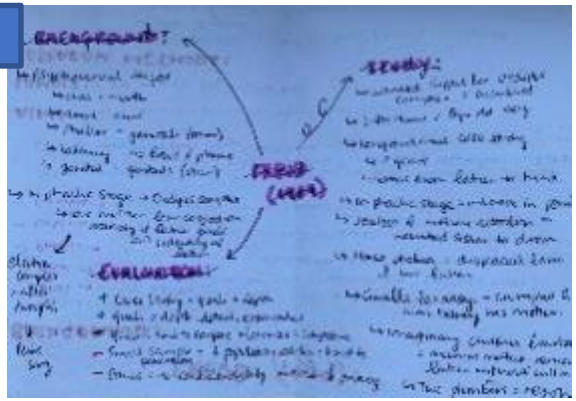

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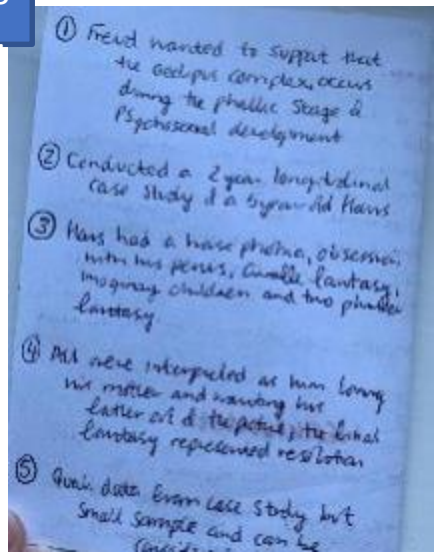
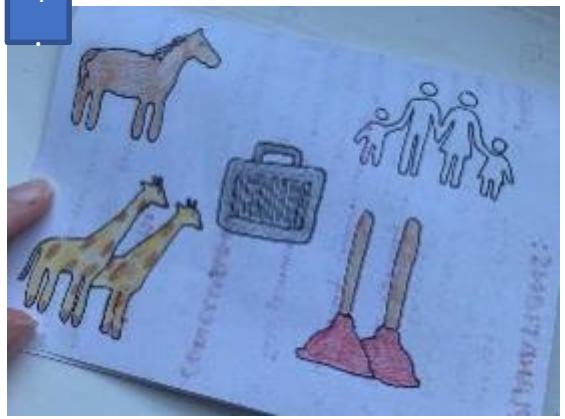


Revision week 1	Revision week 2	Revision week 3	Revision week 4	Revision week 5
Notes page (step 1)	Mindmap (step 2)	Break	Flashcard (step 3)	Symbols (step 4)

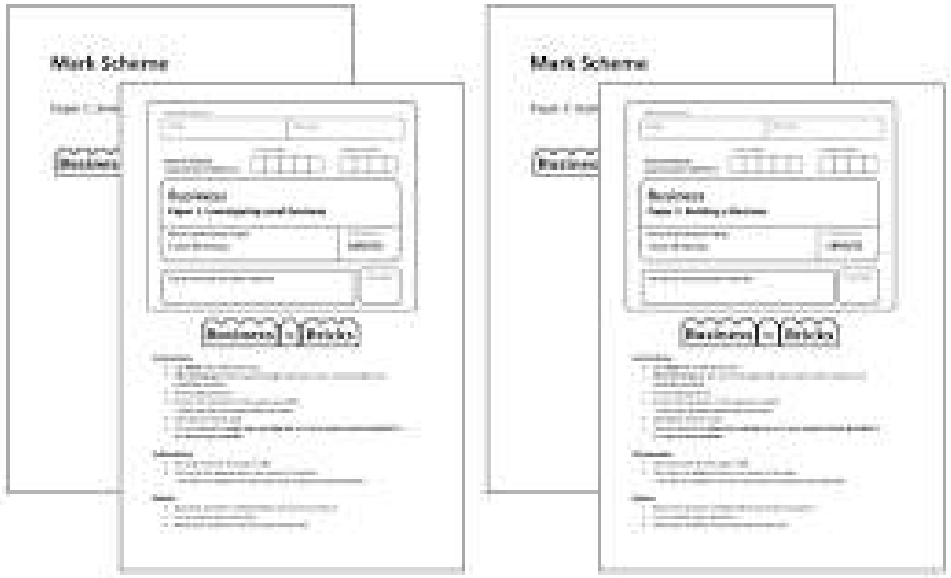
4



‘You be the teacher’:

- **Plan to teach** a topic or core piece of research to your peers or a family member – **or actually teach** them.
- The planning processes requires **cognitive elaboration and deeper processing** as you need to learn the content well enough yourself to teach it to another person.
- Even expecting to teach someone has a **positive impact on learning**, this impact is enhanced when you actually teach someone else.
- You could teach a peer within your subject, a peer or family member who does not take that subject.
- **Protégé effect –** students enlisted to tutor others work harder to understand the material, recall it more accurately and apply it more effectively.

Applying your knowledge



In addition to techniques to help you remember/recall the information, you need lots of practice applying it to past exam questions.

Ask your teachers which exam board you are doing, and the best websites to use.

What is self quizzing?

- **Nearly everything you do in school you need to have knowledge for, and that relies on your long-term memory.**

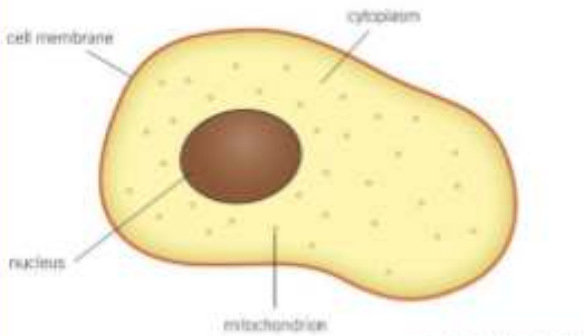
- **The self-quiz is designed to help you memorise the most important information.**

1) **You study part of your Knowledge Organiser (identify key words and write them down if appropriate)**
2) **Cover up part or all of the information**
3) **Try to write out as much as you can remember**
4) **Self-check and self-correct (including any spelling mistakes) in a green pen.**

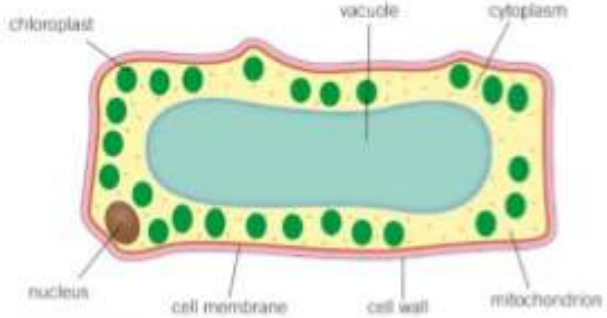
- **Test yourself until you have learned it by heart (usually about 20-30 min).**

Biology B1.1: Cells

Section 1: Cell Structure		Eukaryotic	
Cell Structure	**Function**	**Animal Cells**	**Plant Cells**
1 Nucleus	Contains **genetic information** that **controls** the functions of the cell.	Y	Y
2 Cell membrane	Controls what **enters** and **leaves** the cell.	Y	Y
3 Cytoplasm	Where many **cell activities** and **chemical reactions** within the cell occur.	Y	Y
4 Mitochondria	Provides **energy** from **aerobic respiration**.	Y	Y
5 Chloroplast	Where **photosynthesis** occurs.		Y
6 Vacuole	Used to **store** water and other chemicals as **cell sap**.		Y
7 Cell wall	**Strengthens** and **supports** the cell. (Made of **cellulose** in plants.)		Y



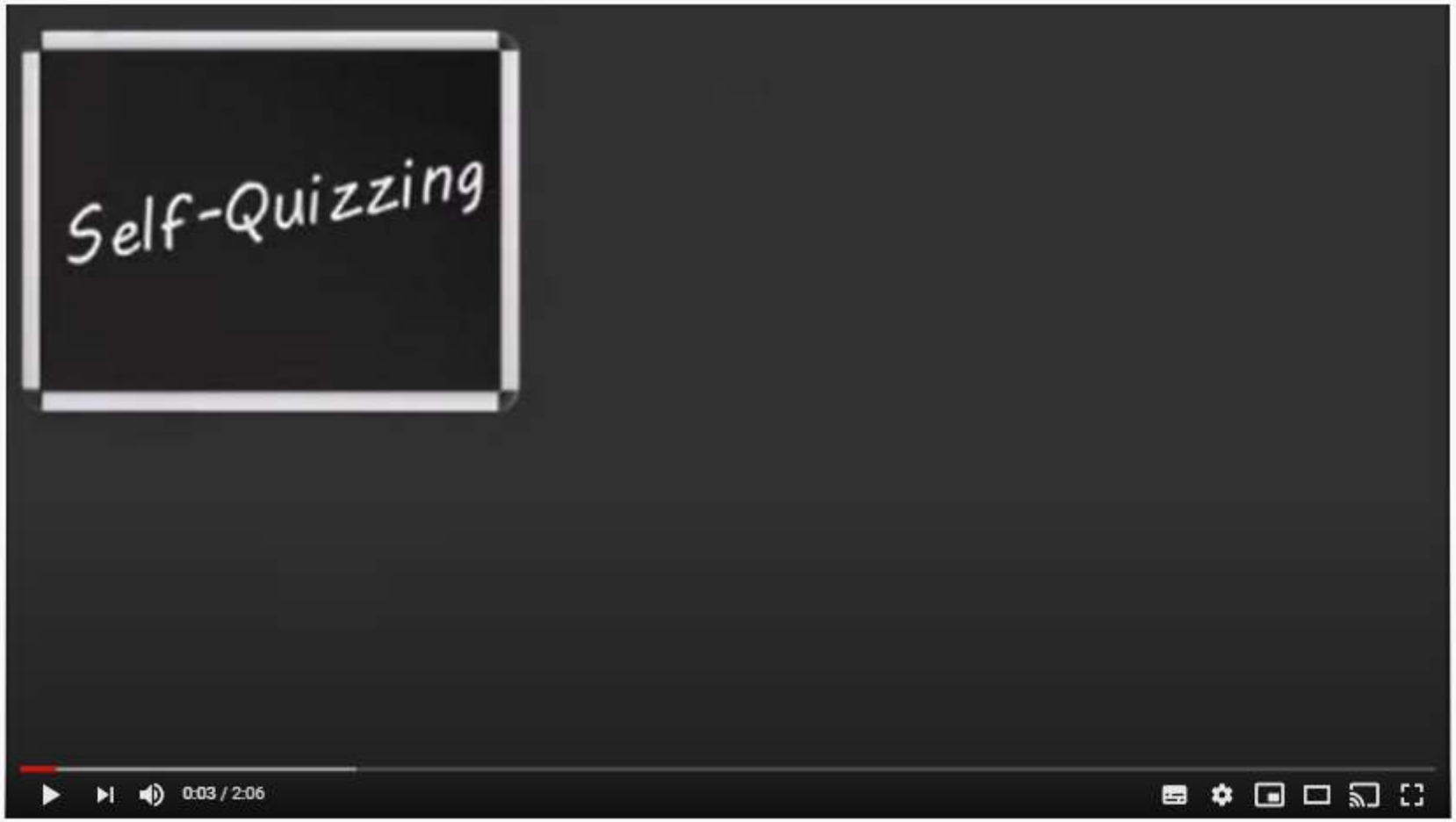
▲ An animal cell.

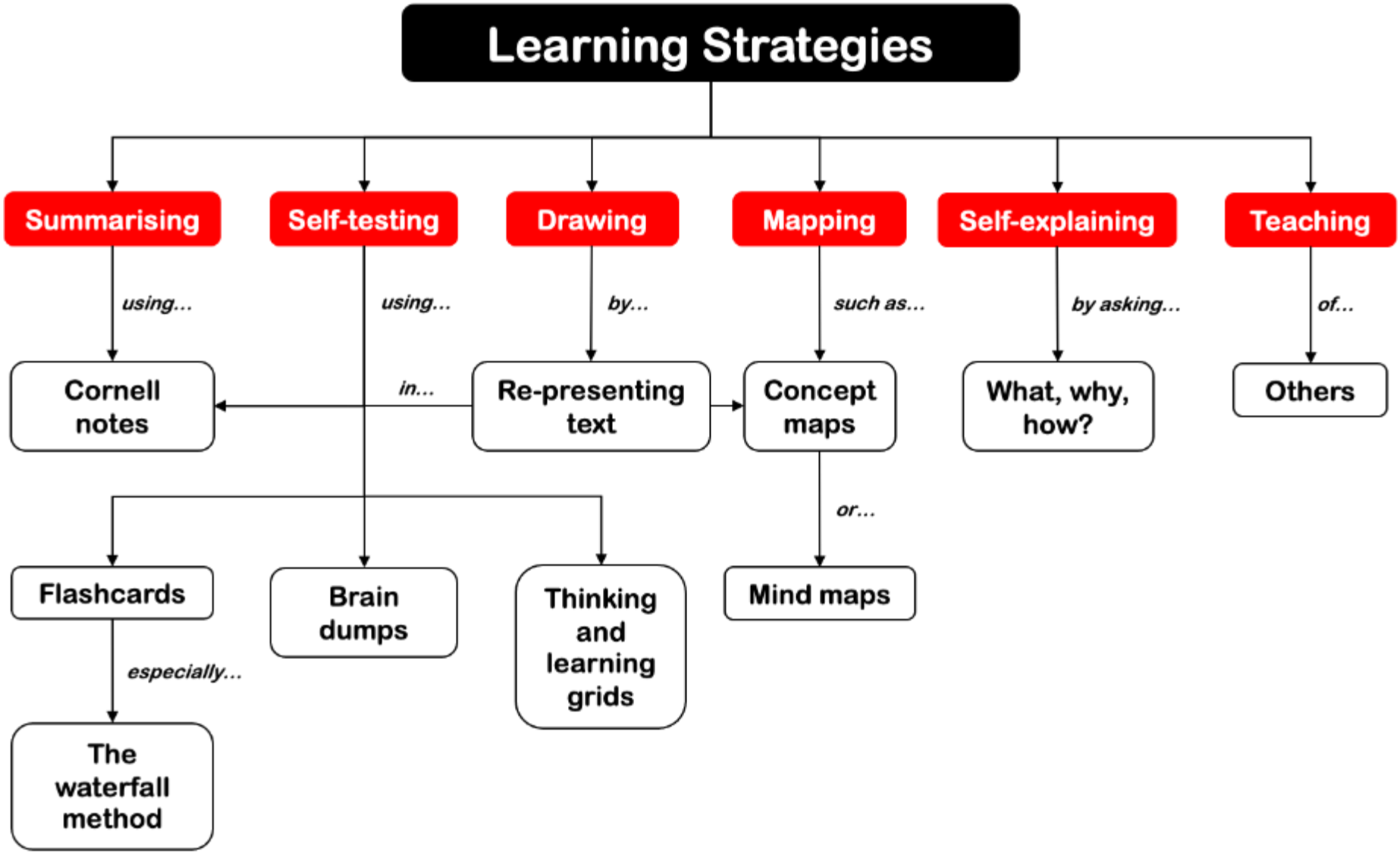


▲ A plant cell.

What is self quizzing?

- https://www.youtube.com/watch?v=2JMbj1y4Smo




Learning Strategies
Summarising
Self-testing
Drawing
Mapping
Self-explaining
Teaching
using...
using...
by...
such as...
by asking...
of...
Cornell notes
in...
Re-presenting text
Concept maps
What, why, how?
Others
or...
Flashcards
Brain dumps
Thinking and learning grids
Mind maps
especially...
The waterfall method

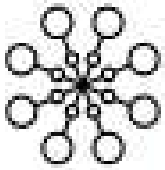
Summarising

When asked a question such as 'what have you done today?', you'll likely provide a summary. This involves you selecting, organising and integrating the key moments of your day. Taking a similar approach with your studies can have a very powerful effect on your learning. What is absolutely key is that you use your own words and don't mindlessly copy your notes or revision guide.

Self-testing

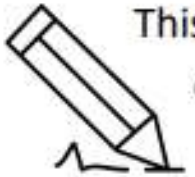
Research has shown that every time you bring a memory to mind, you strengthen it. And the more challenging you make this retrieval, the greater the benefit. Self-testing improves the recall of information, transfer of knowledge and making inferences between information. Equally, there are many indirect effects such as a greater appreciation of what you do and don't know, which helps you plan your next steps.

Mapping



Mapping a brilliant way of organising and learning information as I hope is demonstrated on various pages in this booklet. It helps you break down complex information, memorise it, and see the connections between different ideas.

Drawing



This is about turning text into some form of drawing. Doing so involves you selecting, organising and integrating the information that matters, which forces you to think. This approach can be incorporated into the three strategies above too.

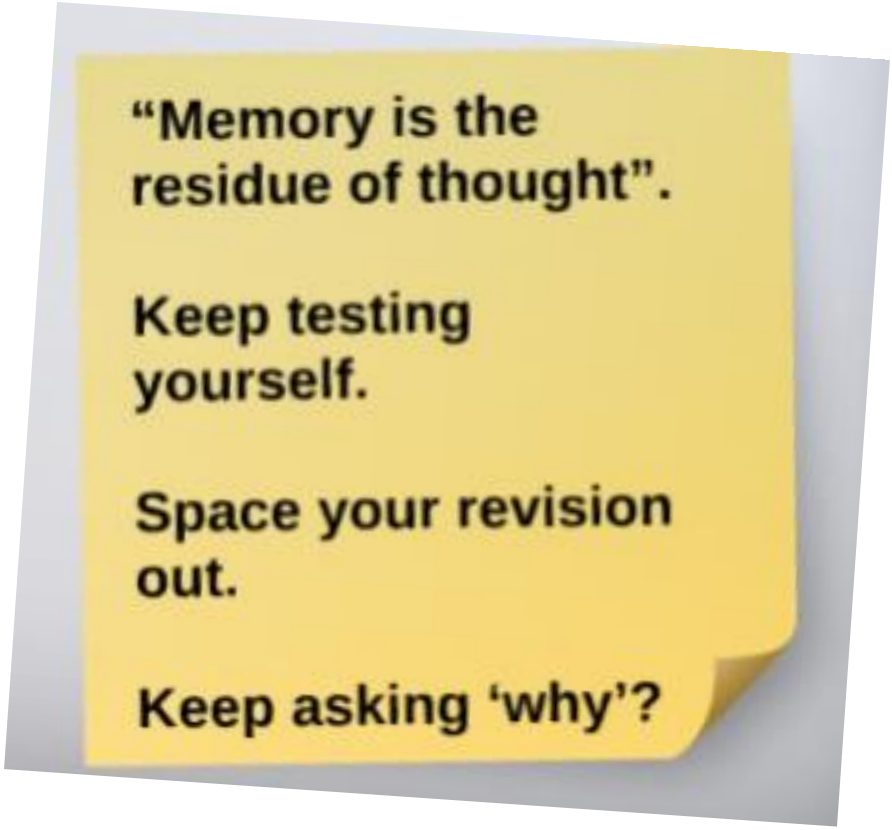
Self-explaining

Continually ask yourself 'How?' and 'Why?' when studying a topic and then try to provide answers to these questions. Doing so helps you to see connections and differences between ideas. Self-explaining can also involve you saying loud the steps you're taking when solving a problem. A recent analysis of 64 research studies showed that 'it is better to ask a student to see if they can explain something to themselves, than for a teacher or book to always explain it to them'.

Teaching

Einstein is supposed to have said 'if you can't explain it simply, you don't know it well enough'. This strategy works best when you know in advance that you will be teaching someone. As with self-explaining, you're forced to select and organise what's important so that your teaching is as clear as possible. Having someone to interact with and ask you questions strengthens your own learning.

In summary……


"Memory is the residue of thought".
Keep testing yourself.
Space your revision out.
Keep asking 'why'?