



**Exam preparation and  
revision**

# Learning

The image features a central graphic of a human head profile in shades of blue and green, constructed from a low-poly, geometric style. The head is filled with various mechanical gears of different sizes and colors (blue, green, red, black). The background is a dark grey with scattered black and white dots, and larger splatters of blue, green, and red. The word "Learning" is written in a white, elegant cursive font across the upper part of the head. A white horizontal line is positioned below the word, extending from the left side towards the center of the head.

# KNOW YOUR ENEMY





# WHAT IS LEARNING?

---

- 1) The retention and transfer of knowledge
- 2) A change in the way the world is understood

(Didau 2016)

Learning consists of 3 parts. It involves retention, transfer and change. It should last and be flexible.

Learning is invisible - we have to observe our behaviours to see if we have truly learnt something:

- 1) Will I still know this next week, next month, next year?
- 2) Can I apply this learning to a new example, subject or place?
- 3) How will this transform my understanding of the world?



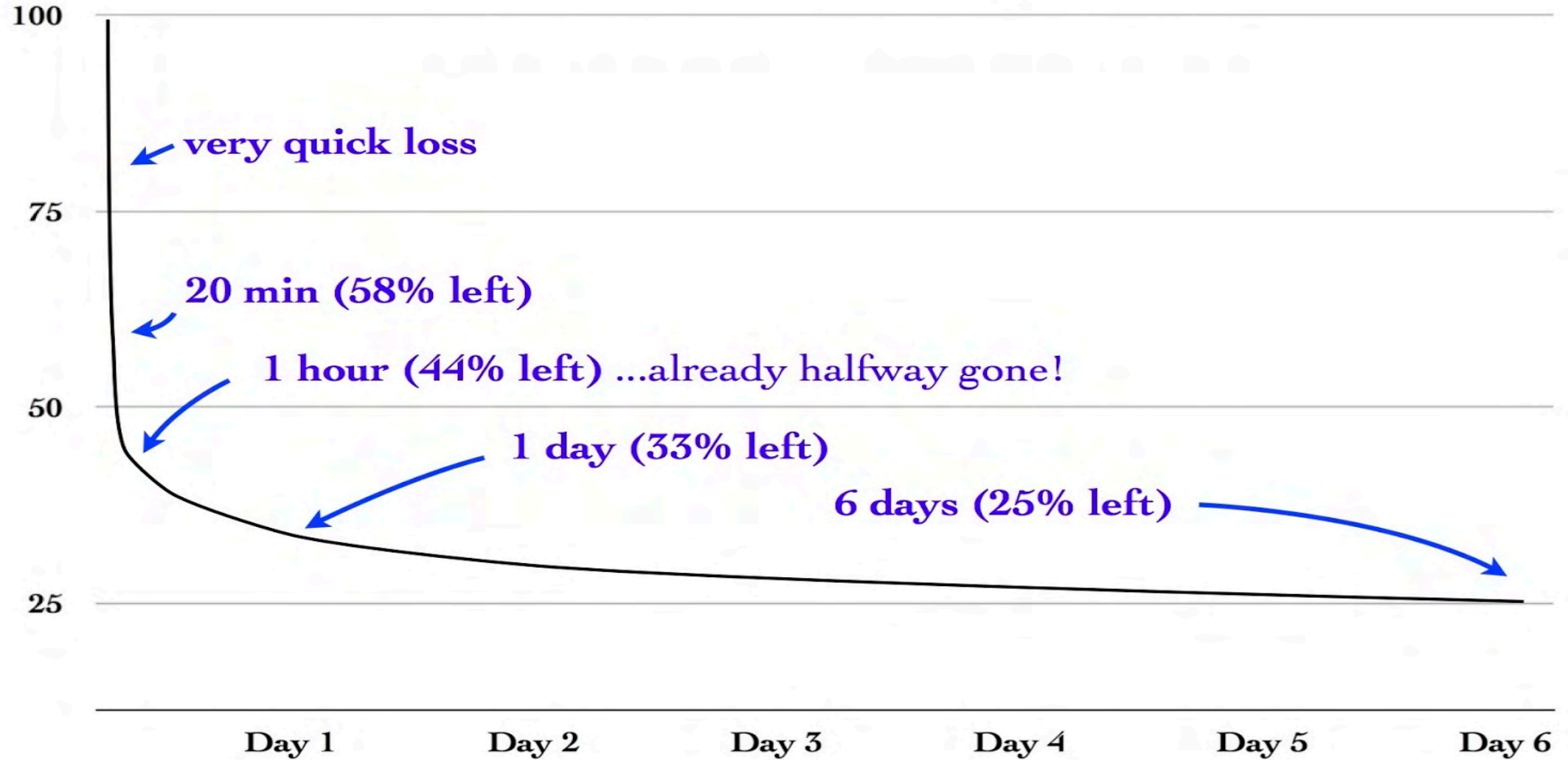
# LEARNING AND MEMORY

---

- One of the challenges that we face in the pursuit of learning is the fact that we forget.
- Forgetting is what our brain does - it processes so much every day that if you remembered absolutely everything your brain would be overwhelmed.
- Ebbinghaus, a German psychologist, sought to understand how forgetting works in our brain. In 1885, his work led him to discover what we know today as the 'Forgetting Curve'.
- The curve shows us just how quickly our memories fade.
- While this is important for our everyday functioning, we need to understand how to use our knowledge of this to help us take our learning into our long-term memory in preparation for our exams.

# Ebbinghaus' Forgetting Curve

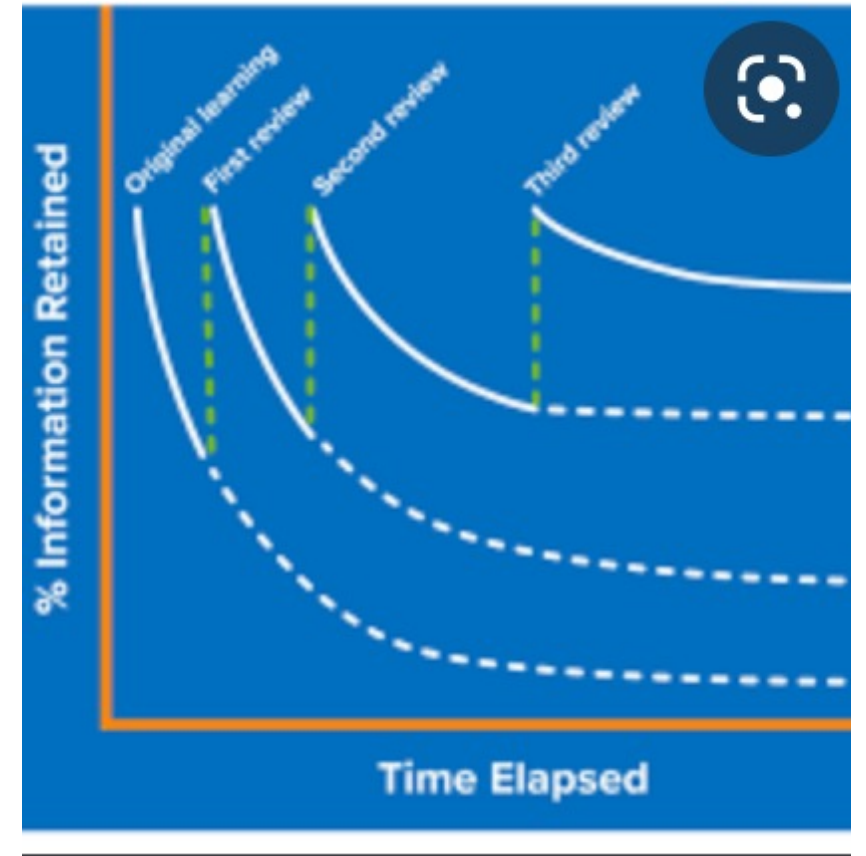
(How much of something do we forget each day?)



# OPTIMAL INTERVALS FOR RETAINING INFORMATION

- Just as research can tell us about forgetting, it can also give us some direction as to how best to overcome this.

How often do you need to revisit something in order to learn it for a set amount of time?



# WHAT ARE THE BEST GAPS BETWEEN REVISION?

---

Time to test	Optimum time between study sessions
1 week	1-2 days
1 month	1 week
2 months	2 weeks
6 months	3 weeks
1 year	4 weeks



# WHAT DO WE KNOW SO FAR?



When we talk about learning, we are aiming for the long-term retention of knowledge.



We need to revise something a number of times in order to learn it for our exams



The more regularly we recap something, the stronger our memory becomes

# WHAT DO WE KNOW ABOUT REVISION?



Research tells us that many students don't really know how to study.



Various studies have shown that students tend to rate ineffective techniques highly.



In reality, this means that time spent on these is a waste of time.



It gives the illusion of competence - short term success at the expense of long term gains.



(Hendrick, C 2018)

# STUDY TECHNIQUES

How many of you have used the following techniques?

- Reading textbook/revision guide
- Highlighting/summarising key words
- Mnemonics
- Summarisation
- Copying up notes
- Colouring stuff in

These are all common, but incredibly ineffective

Professor John Dunlosky, a leading expert in effective study skills, examined hundreds of exam paper grades. He matched them to the revision techniques that students had used. He used this data to explore what the most effective techniques were.

The most ineffective technique was re-reading and highlighting.

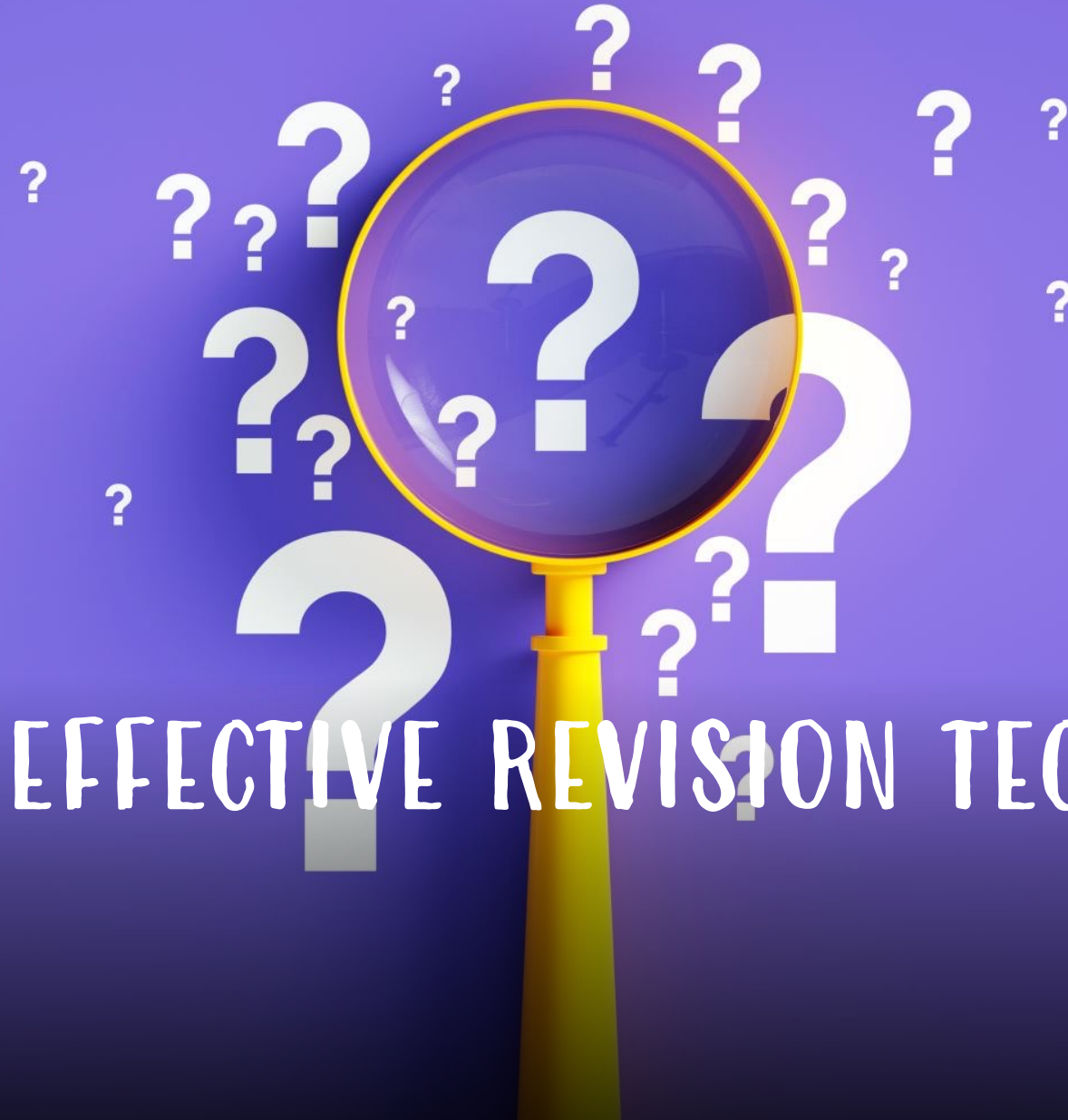
# EFFECTIVE LEARNING

The previous techniques are not effective because they are passive.

In order to create a memory in your brain, you have to process the information.

By process, we mean think hard about it.

"Memory is the residue of thought" - Willingham, D (2009)



WHAT ARE EFFECTIVE REVISION TECHNIQUES?



### **Avoid all distractions:**

- ⇒ Be honest and strict with yourself;
- ⇒ Keep your TV, computer, laptop, ipad, phone, kindle, Facebook, twitter and any games away
- ⇒ If music becomes a distraction, get rid of it.
- ⇒ Do not waste time or delay starting.

### **In your breaks:**

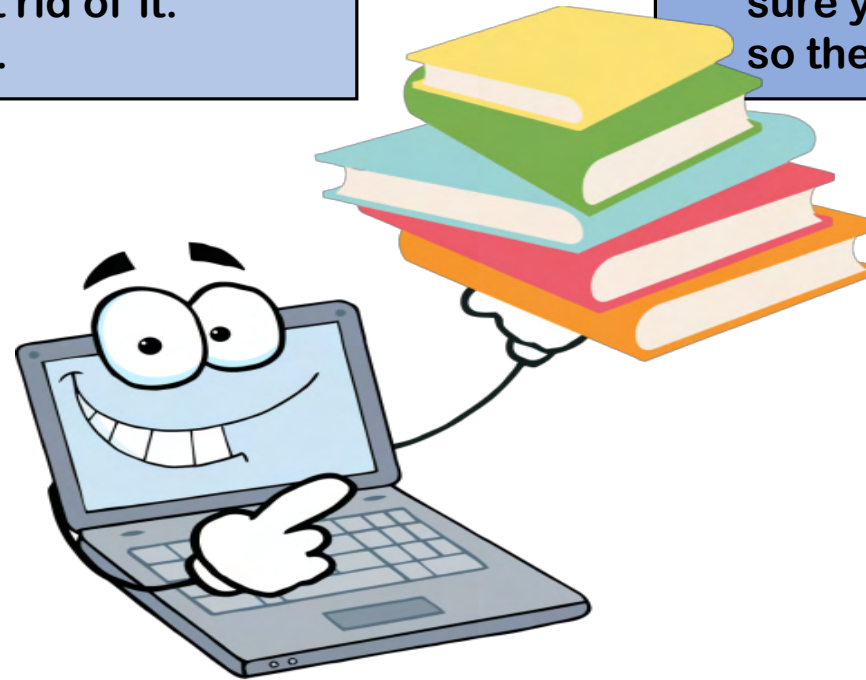
- ⇒ move around;
- ⇒ drink water;
- ⇒ eat something .

### **Sleep well:**

- ⇒ Do not work into the early hours of the morning
- ⇒ give yourself a break between finishing revision and going to bed.

### **Find a space you are comfortable revising in:**

- ⇒ This might be your bedroom, or a study or the kitchen. Some of you might find it easier to revise if your parents are there with you.



- ⇒ Clear space to store folders, textbooks and revision.
- ⇒ It is going to be around for a while so make space for it somewhere in your house. Make sure you tell parents what it is and where it is so they do not move it or throw it out!

You will need a desk or a table that is not cluttered so you can spread things out on. You might want to leave things out for the next session.

Do some form of exercise during revision and exams.

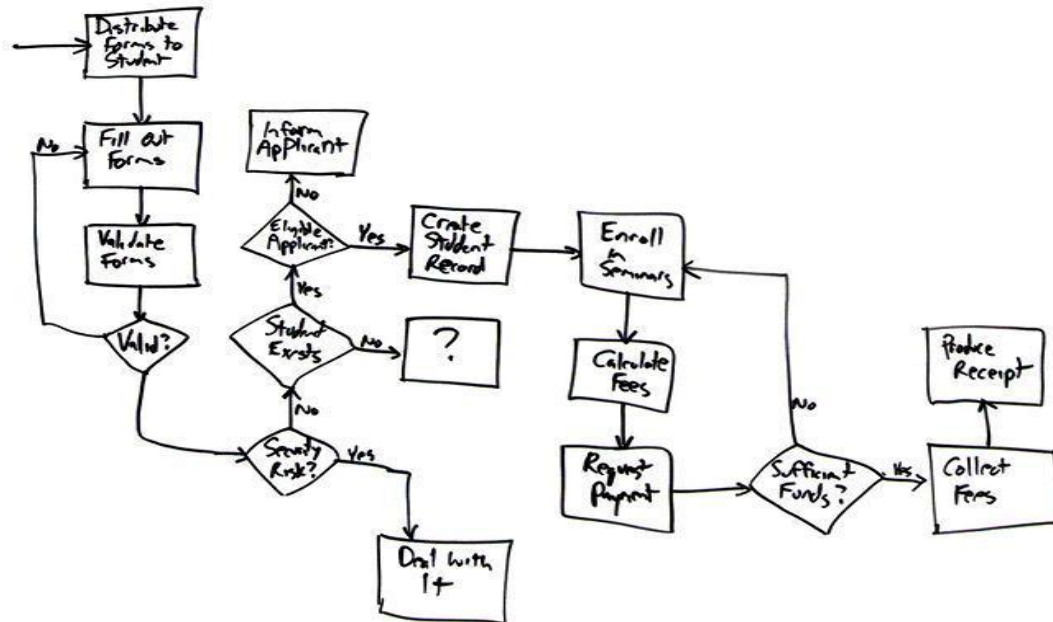
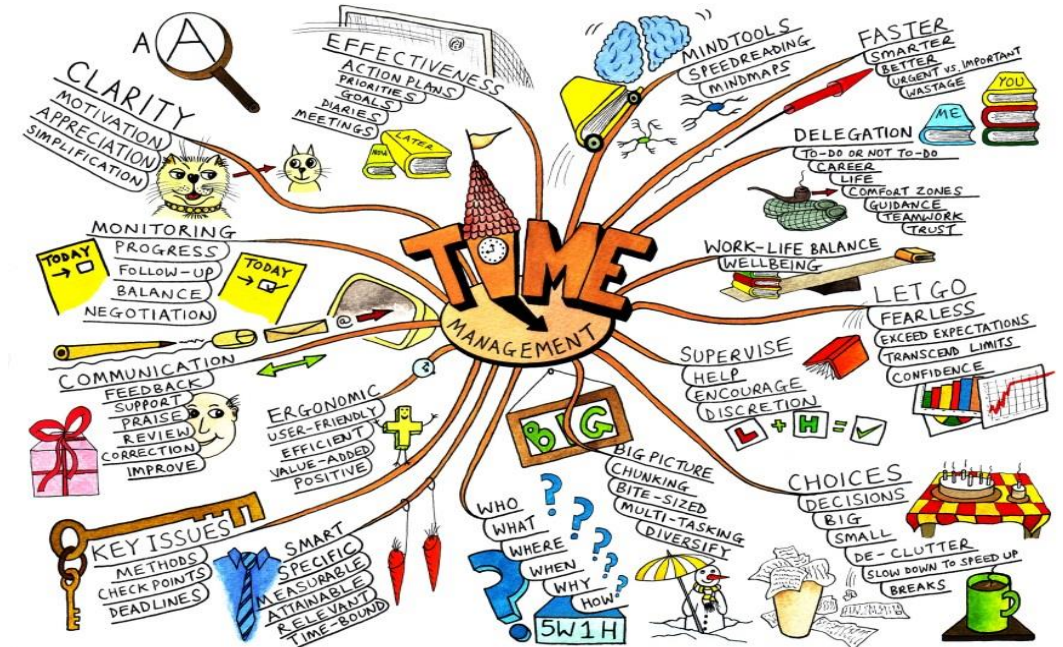
Reward yourself at the end of your revision session.

### **Tell your parents/family or who you live with when you are revising:**

- ⇒ They can help by keeping distractions away from you including themselves, brothers, sisters, friends and pets and keeping the house quiet.
- ⇒ They can help and support you by testing you and keeping you on track if you lose focus.

## Mind maps or spider diagrams:

- Key question, exam question or a key topic in the centre;
- Subtopics or subheadings;
- Add key pieces of information;
- Develop some of your points;
- Add symbols or images;
- Use different coloured pens or highlight different points;
- Use different sized pieces of paper.



## Flow charts or timelines:

- Large pieces of paper (rolls of wall paper or pieces stuck together);
- Key dates, ideas, processes or stages;
- Add the information as you go along;
- Use different coloured pens or highlighters;
- Add images or diagrams.



# RETRIEVAL PRACTICE

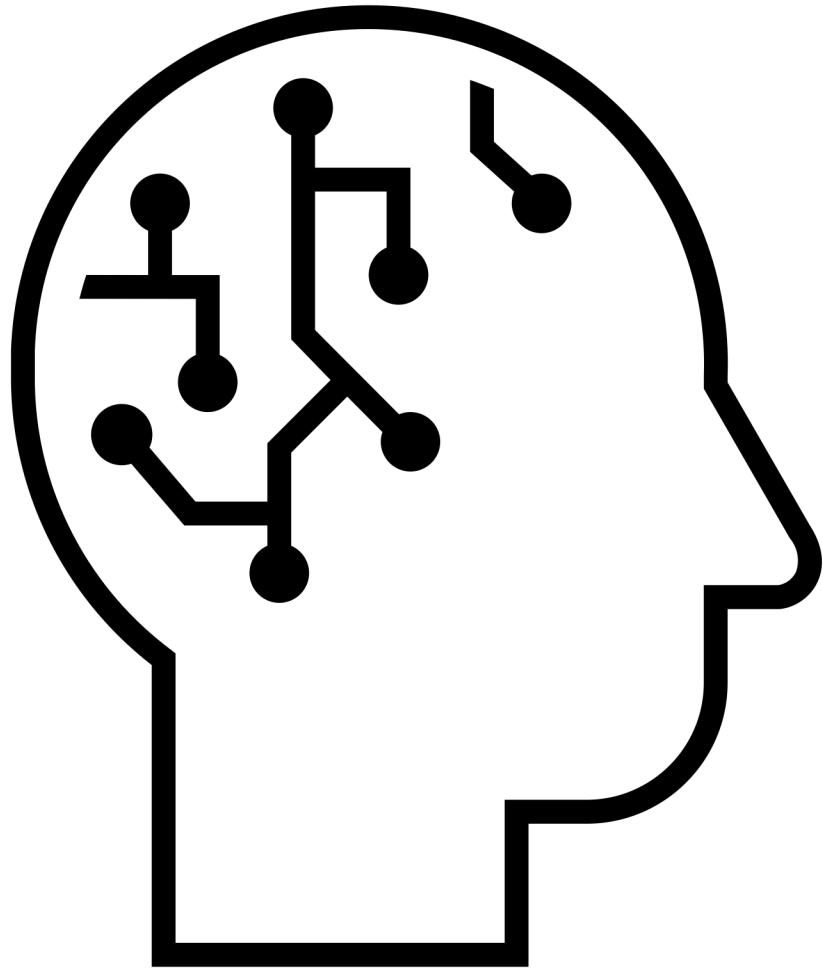


# HOW DO I DO RETRIEVAL PRACTICE EFFECTIVELY?

- This is a technique to help you recap your learning quickly and effectively
- You simply write down everything you can remember about the topic you're revising

How?

- Put your study notes/revision guide away
- Write it down from memory
- Check it against your notes and identify what you haven't remembered. Focus your revision on that until you can recall everything.





# HOW DO I DO ELABORATION EFFECTIVELY?

---

- Ask yourself questions while you are studying about how/why things work.
- Make connections between different ideas and explain how they work together.
- Stick to accurate explaining/describing. If you make some new connections, check them out with your teacher first.
- Work your way up to being able to describe your learning using your notes/revision guide through to being able to do this without the notes/revision guide.
- This can be done verbally, to someone else, in voice notes, in your own head - whatever works for you!





# THE LEITNER METHOD

---



# Physics

## PI REDSHIFT

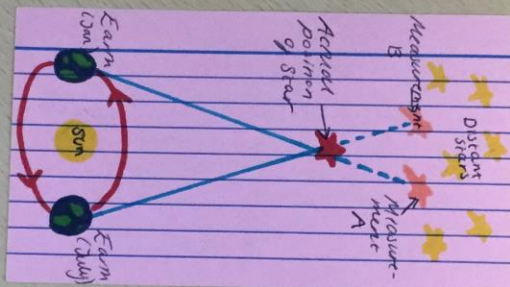
If a source of light moves away from us, the wavelengths of the light in its spectrum are **longer**. That if it was not moving.

This is known as **redshift** because the wavelengths 'shift' towards the red end of the spectrum.

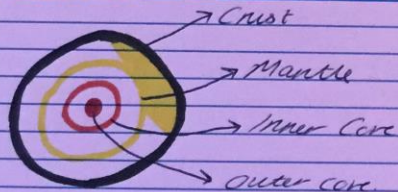
PI  
The future depends on the amount of **mass** in the Universe.

**Not enough mass** The Universe will keep on expanding.

**Too much mass**, gravity will be strong enough to pull everything back together and the Universe will collapse in a **Big Crunch**.



## STRUCTURE OF EARTH



## Measuring Distances in Space

### RELATIVE BRIGHTNESS

The dimmer a star is, the further away it is. However stars vary in brightness so we can never 100% be certain.

**BOTH METHODS ARE ASSUMPTIONS**

PI

One theory about how the Universe began is the Big Bang theory, which says the Universe started with a **huge explosion** 14,000 million years ago.

Hubble's Law: The further a galaxy is away from us the faster it's moving.

PI

Judging stars & galaxies by this has become more difficult because of **light pollution** from towns.

This is why many telescopes are on high ground or are in locations away from towns/cities.

## Top Tips

- Create cards frequently - after every lesson/topic/week/theme/unit
- Use symbols, colours, headings
- Go over them continually - your piles of cards will get slimmer as time goes by and you learn more information by heart.

**DO SOMETHING** with the information in your files/books/revision booklets. The least effective way to revise is to read and re-read your notes.

**TRANSFORM** them into new materials - flashcards, quizzes, powerpoints.

**CUT UP/PASTE** resources from other sources  
**ANSWER** practice questions

**MAKE** songs, mnemonics, mind maps etc  
**GET** people to test you.



P3

- Like power stations burning fossil fuels, the heat energy is used to boil water.

- The kinetic energy in the expanding steam spins the turbines, which drives generators to produce electricity.

### NON-RENEWABLE ENERGY (will eventually run out)

- Fossil fuels e.g. coal, oil & natural gas
- Nuclear fuels such as uranium.

Fossil fuels release CO<sub>2</sub> when they burn which adds to the greenhouse effect and increased global warming.

### NEGATIVES

- Wind farms are noisy and may spoil the view of people.

- They also rely on natural resources so may not be reliable e.g. no wind, no electricity, solar won't work at night.

P3

Irradiation is used in ~~the~~ medical treatments like x-rays.

Contaminators can be far more damaging, yet is often used in medical treatments as well such as cancer suppression where the risk ~~is~~ worth the benefit.

### IONISING RADIATION

Radiations from radioactive materials:

- Alpha α

- Beta β

- Gamma γ

These can damage living cells.

P3

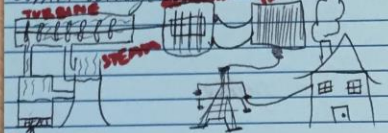
Electricity is produced.

4 The electricity goes to the transformer to produce the correct voltage.

The fuel used eventually becomes solid nuclear waste. This waste is radioactive and emits ionising radiation.

P3

- Electricity is then produced which goes to transformer to produce the correct voltage.



Energy source

### ENERGY TRANSFER

- Energy can't be destroyed, it is transferred to its surroundings.

Calculating efficiency: (will always be less than 100%)

$$\text{efficiency} = \left( \frac{\text{useful energy transferred}}{\text{energy supplied}} \right) \times 100$$

P3

- Like power stations burning fossil fuels, the heat energy is used to boil water.

- The kinetic energy in the expanding steam spins the turbines, which drives generators to produce electricity.

### NON-RENEWABLE ENERGY (will eventually run out)

- Fossil fuels e.g. coal, oil & natural gas
- Nuclear fuels such as uranium.

Fossil fuels release CO<sub>2</sub> when they burn which adds to the greenhouse effect and increased global warming.

### NEGATIVES

- Wind farms are noisy and may spoil the view of people.

- They also rely on natural resources so may not be reliable e.g. no wind, no electricity, solar won't work at night.

P3

Irradiation is used in ~~the~~ medical treatments like x-rays.

Contaminators can be far more damaging, yet is often used in medical treatments as well such as cancer suppression where the risk ~~is~~ worth the benefit.

### IONISING RADIATION

Radiations from radioactive materials:

- Alpha α

- Beta β

- Gamma γ

These can damage living cells.

P3

Electricity is produced.

4 The electricity goes to the transformer to produce the correct voltage.

The fuel used eventually becomes solid nuclear waste. This waste is radioactive and emits ionising radiation.

P3

- Electricity is then produced which goes to transformer to produce the correct voltage.



Energy source

### ENERGY TRANSFER

- Energy can't be destroyed, it is transferred to its surroundings.

Calculating efficiency: (will always be less than 100%)

$$\text{efficiency} = \left( \frac{\text{useful energy transferred}}{\text{energy supplied}} \right) \times 100$$

# WHAT DO I NEED?

- Sets of flash cards - you can make your own or buy them online. Flipsco cards are great English ones, for example.
- Get some boxes
- Make sure you understand the method
- Get going!



## Macbeth

☆☆☆☆☆ (100 customer reviews)

£2.99 Incl. VAT

*Macbeth* GCSE English Literature revision cards (20 x A6 double sided)  
Content includes a critical analysis of each character and theme, as well as a wider reading list, plot summary, contextual information, analysis of biblical allusions, and key vocabulary.

See foot of page for bulk discounts – these will be calculated at the checkout.





EFFORT



# EFFORT

---

- How many times have you thought 'if I just put more effort in, I'll be fine'?
- How many times have you said 'I'll try harder'?
- How many times have you told people you'll 'put more effort in'?
- What actually is 'effort'?

# WHAT IS 'EFFORT'?

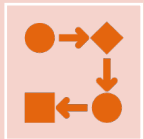
---



Professor John Dunlosky, one of the world's leading experts on effort, defines it as 'the conscious exertion of work'.



How do we measure that? Is it the time we spend on something?



That only really tells us how long you've done something for.



# FUN EFFORT FACTS

---

- Objective effort does not directly impact your learning or performance

Eh?

\* It's what you're doing, not the effort invested in it.



# “THE COIN OF THE LEARNING REALM”

---

Student A:

Spent 3 hours last night reading her History book. She highlighted each page beautifully. She stayed up till 1 am copying it up into lovely notes.





# ”THE COIN OF THE LEARNING REALM”

---


Student B:

Studies in 3 20 minute slots. He completes an Educake quiz and finds out the things he doesn't know yet. He then reads through his revision guides on those areas and uses this to produce his own notes, using his own words. He then moves on to some Maths. He knows Algebra is a weakness so he uses a Hegarty Maths video to go over the things he knows he finds difficult. He works through this and tests himself.

The next morning, he goes over these in his head on the bus on the way to school. He checks this against a photo of his notes on his phone to make sure he's remembered it all.

First step is to list your subjects and what main topics/units you need to cover:

What I need to revise:

English 	Maths 	Geography 	History 	Computing 
Component 1 Language Fiction Reading Section A	Number 1	The changing landscapes of the UK	USA – 1920s People and the Boom	System Architecture and Memory (Comp 1)
Component 2 Language Non-fiction Reading section A	Number 2	River landscapes and processes	USA – 1930s Depression and the New Deal	Secondary Storage (Comp 1)
Comp 1 Sect B – Creative prose writing – story	Number 3	Glaciated upland landscapes and processes	USA – Post-war America	Wired and Wireless Networks (Comp 1)
Comp 2 Sect B Transactional writing – speeches, reviews, articles, reports, letters	Algebra 1	Weather hazards and climate change	Conflict and Tension – Treaty of Versailles	Network Topologies, Protocols and Layers (Comp 1)
A Christmas Carol	Algebra 2	Ecosystems, biodiversity and management	Conflict and Tension – League of Nations	System Security (Comp 1)
Shakespeare play	Algebra 3	Changing cities	Conflict and Tension – Causes of WWII	Systems Software (Comp 1)
Blood Brothers or ATaste of Honey	Algebra 4	Global development	Elizabethan England – Elizabeth & government	Ethical, Legal, Cultural and Environmental concerns (Comp 1)
Poetry anthology	Geometry 1	Resource management	Elizabethan England – Life in Elizabethan times	Algorithms (Comp 2)
Unseen poetry	Geometry 2	Energy resource management	Elizabethan England – troubles home & abroad	Programming Techniques and Producing Robust Programs (Comp 2)
	Geometry 3	Cities fieldwork	Power and the People – Middle Ages: challenging authority and feudalism	Computational Logic (Comp 2)
	Ratio		Power & the People – Early Modern: Challenging royal authority	Translators and Facilities of Languages (Comp 2)
	Probability & Statistics		Power and the People – 19 <sup>th</sup> & 20 <sup>th</sup> Century: Reform & Reformers; Equality & Rights	Data Representation (Comp 2)



**Subject:** Then you need to break subjects into smaller topics/units as per example started below:

Plot what you need to do weekly. **Example below.** My Revision Planner:

Time:	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
9am-10am	School	School	School	School	School		
10am-11am	School	School	School	School	School	Spanish Module 5 - Ciudades - local area	
11am-12pm	School	School	School	School	School		Revision for English flashcards Living Space
12pm - 1pm	School	School	School	School	School	My Maths	Geog revision Weather hazards and climate change
1pm-2pm	School	School	School	School	School	Physics Energy	
2pm-3pm	School	School	School	School			
3pm-4pm		English after school	Maths Revision after school	Science after school		Revision English flashcards London	
4pm-5pm	RE revision - 30 mins Geog revision - 30 mins				<b>Night off!</b>		RE revision 30 mins
5pm-6pm	Weather hazards and climate change	My Maths	PE - Health, fitness & well-being	Any homework		Any homework	Maths booklet
6pm-7pm		Any homework	Computing - Secondary Storage (Comp 1)	Poetry - poetry question 20 mins Prelude			Any homework
7pm-8pm	Biology B1 Cells						
8pm-9pm							