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Memory for learning: Teacher's notes

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NOTES



Memory for learning

NOTES FOR TEACHING

This PowerPoint takes five key ideas about memory and encourages students to apply them to their own learning. It gives some information about what memory is, how it works and how we can learn more efficiently. The notes under each slide are reflected in this booklet.

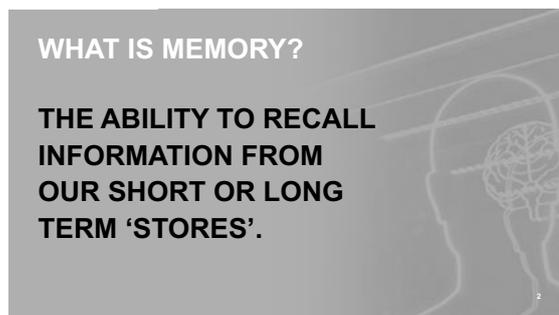
There are a number of fun activities that you can do with students to get them to fully understand memory and also reflect the points we are making – these are not dry facts but information that students can use in a meaningful way to help their learning.

SLIDE 1



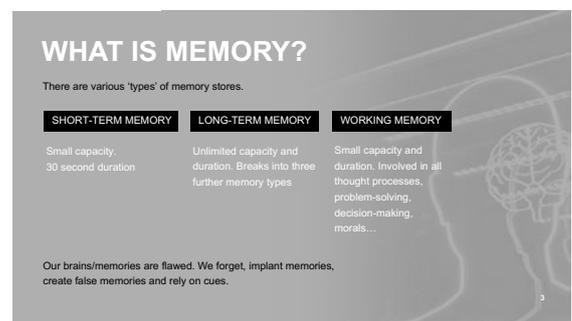
Notes: n/a

SLIDE 2



Notes: n/a

SLIDE 3



LEARNING POINT

Short Term memory is 30 seconds and we can remember 7 +/-2 things – you can have a go by trying to get students to learn random sequences of numbers, give them a task to do (say a maths problem that takes a few seconds so they don't repeat the numbers/letters) and then check recall.

Long-term memory will be addressed in this presentation.

Working memory (WM) is what we use when we do a task – so think about recalling number of rooms in your home, you will have to pull information about your house from your long term memory, hold that then count the number of rooms, where all this processing takes place is in the working memory. For some young people WM is slower – so when you ask them to do as task with lots of elements they may struggle as they can't hold all the elements and manipulate them at the same time.

SLIDE 4

WHAT IS LONG-TERM MEMORY?

LONG-TERM MEMORY	PROCEDURAL	EPISODIC	SEMANTIC
Unlimited capacity and duration. Breaks into three further memory types	Knowing how to do certain actions / motor movements: <ul style="list-style-type: none">• Texting• Typing• Walking• Cycling• Driving	Episodes from personal experiences: <ul style="list-style-type: none">• Holidays• Happy or sad events• The visual memories in our mind with strong emotions	Factual knowledge: <ul style="list-style-type: none">• Capitals of countries• Naming items• Times tables• Key terms

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POSSIBLE ACTIVITIES

Get them to describe how they learned to ride a bike or how they cook a meal, often we can do these tasks without thinking but when we first learned we really had to think about what we were doing.

Episodic – a really good one for this is to get them to think about their last birthday. But can they remember what they did three weeks ago last Tuesday? Unless of course it was their birthday or there was another significant event, they are unlikely to be able to remember.

Semantic memories – these are the dry facts we learn in school and these are the ones that we struggle to learn when we are revising. BUT if we know tricks we can learn facts with great ease...

SLIDE 5

WHAT IS MEMORY?

- Learning is the creation of new **semantic** memories
- However, semantic memories alone are just facts, and we can often **forget** these as they are **meaningless**
- So, we need to **apply** our factual knowledge to real-life situations, examples, case studies or through reading the news in order to create episodic memories
- This creates stronger memory connections / two memories are better than one

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POSSIBLE ACTIVITY

Find an example of a dry fact and then get students to put their own spin on it. For example Mean, Median & Mode (three types of averages and how to calculate them), even in Year 7 most students will have come across these.

The Mean – this is the mean one as you have to do all the really hard calculation – adding up and dividing.

The Mode is the most fashionable (a la mode is of the fashion in french) so the most numerous/popular option.

The median – well that's the other one – the middle number.

This is personal to me as I did French A-Level so Mode (fashion in french) helps me remember when I see the word, but it will be meaningless if you don't do French – so give students something to recall and encourage them to make it personal to them.

SLIDE 6

APPLYING FACTS ABOUT MEMORY TO LEARNING

FIVE KEY FACTS TO KNOW

1 2 3 4 5

Notes: n/a

SLIDE 7

LEVEL OF PROCESSING

- The more **deeply** we process information
- The **more likely** we are to remember it
- **Semantic** processing (according to meaning)
- The deepest and best way to encode information

INPUT → STRUCTURAL PROCESSING → LONG TERM MEMORY
 INPUT → ACOUSTIC PROCESSING → LONG TERM MEMORY
 INPUT → SEMANTIC PROCESSING → LONG TERM MEMORY

LEARNING POINT

Ask students how often they have read a page of a book and got to the bottom and can't remember a thing or just learned something by heart without understanding it. How long does it stay in their memory, the answer is not very long.

POSSIBLE ACTIVITY

To really remember something it must be meaningful, we need to understand it. You can use the following three slides to give to your students.

Split them into three groups and give one third a copy of the first slide, one third a copy of the second etc. Give students about 30–60 seconds to complete the task – ask them to put the paper down once they have completed it. Then ask them to recall the words. You will find that those that had to think about the meaning of the words (slide three) will do better than the other groups. They have processed the information at a semantic level.

SLIDE 8

ACTIVITY 1

Think of a sentence for each word in the list.
E.g. Eagle – The eagle soared high over the mountains

Buttercup	Jumper
Broccoli	Goggles
Haddock	Piano
Lorry	Biro
Oak	Sofa
Knife	Kitchen

Notes: n/a

SLIDE 9

ACTIVITY 2

Make a mental note of whether the word is in capital letters or not.
E.g. EAGLE – yes. eagle – no.

BUTTERCUP	Jumper
Broccoli	GOGGLES
Haddock	PIANO
LORRY	Biro
OAK	Sofa
Knife	KITCHEN

Notes: n/a

SLIDE 10

ACTIVITY 3

Make a mental note of whether the two words rhyme or not.
E.g. Eagle rhymes with mouse – no.

Buttercup rhymes with breakup	Lorry rhymes with sorry
Jumper rhymes with bumper	Biro rhymes with book
Broccoli rhymes with tomato	Oak rhymes with sock
Goggles rhymes with boggles	Sofa rhymes with phone
Haddock rhymes with shark	Knife rhymes with wife
Piano rhymes with glass	Kitchen rhymes with curtain

Notes: n/a

SLIDE 11



WHAT DOES THIS LOOK LIKE?

- Reading, copying, rote learning is superficial learning
- It makes learning and recall much harder
- Recall is best when the material being learned is fully understood
 - Read and recall information
 - Apply new information to other situations
 - Explain information to someone else
 - Write notes in your own words

LEARNING POINT

We can all rote learn information but to make life easier in terms of remembering it is much better to understand the information we are trying to learn.

POSSIBLE ACTIVITY

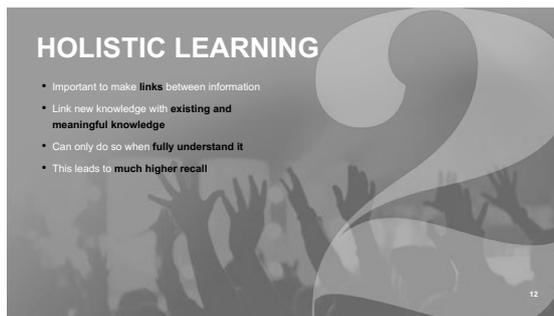
Problem-solving where they can go/what to do if they don't understand something they need to learn – get students to come up with the process they might go through if they were struggling – e.g.

- have a look at BBCbitesize
- check the textbook/their notes
- ask a friend
- ask a parent
- ask the teacher.

TEACHING POINT

How can you help students gain a deeper understanding of the information they are learning – how can you make it relevant to them – application?

SLIDE 12



HOLISTIC LEARNING

- Important to make **links** between information
- Link new knowledge with **existing and meaningful knowledge**
- Can only do so when **fully understand it**
- This leads to **much higher recall**

TEACHER POINT

Do not underestimate how compartmentalised students make learning – what they learn in maths stays in maths and could never be translated into the science, geography or DT lesson!

Often students learn the same fact three times over because they haven't realised that it is part of another subject or a bigger picture. Encourage them to think about when else they might have learned certain facts.

SLIDE 13



LEARNING POINT

This is not dissimilar to the previous idea of making things meaningful. Encourage students to link learning either to other topics within a subject or to the real world. For example in psychology students learn about research methods – this should not be a discrete topic but is applied throughout their learning – so they need to use their understanding of research methods to evaluate evidence supporting the theory of memory – experiments carried out in the laboratory don't reflect real life...

POSSIBLE ACTIVITY

Encourage students to think of concepts/principles/ideas that apply across a range of subjects, ask them how they might use them – e.g. $\pi R^2 \times \text{height}$ could be applied to DT to calculate the volume of a cake tin or in science to work out the volume of liquid in a beaker.

SLIDE 14



TEACHING POINT

Most learning will be organised into topics or areas already so this in terms of teaching this isn't that relevant.

But again don't underestimate students eagerness to learn random facts without thought to how they fit into the big picture (e.g. I will mix up the French flashcards I have made rather than trying to organise the vocab into categories).

SLIDE 15



ACTIVITY

Give students 30 seconds to learn the letters in the first slide, then do the letters in the second slide – if they figure it out they will do better with the second than the first.

Do not underestimate the power of organising information – same letters different order!

SLIDE 16



Notes: n/a

SLIDE 17



LEARNING POINT

Think of cues as keys to unlocking memory, these cues are words that are going to appear on your exam paper so will trigger recall, they are also words that will appear in the specification.

TEACHING POINT

Do you know what your cue words are for your subject that should immediately trigger recall? E.g. photosynthesis, metaphor, pythagoras, convection current?

Use these to test student recall – you can shout out cue words and get students to recall everything they know about those cues.

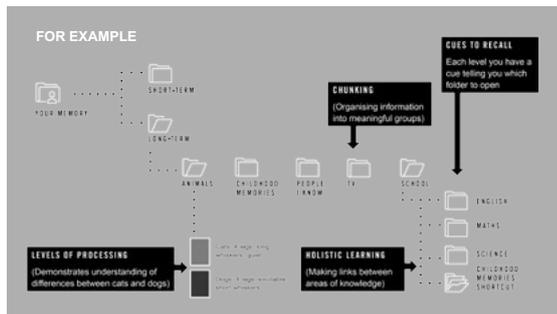
SLIDE 18



POSSIBLE ACTIVITY

Give students random words – e.g. penguin, shooting star, waves – these are the CUES to recall – what students will recall will be different but the point is that the word has unlocked a memory for that student – the only difference is in the exam the memory/recall needs to be essentially the same.

SLIDE 19



LEARNING POINT

Often the human mind is compared to a computer, this is not necessarily helpful as it is much less reliable and unique than human memory but this slide helps to demonstrate how memory might be represented if you wanted to make that comparison.

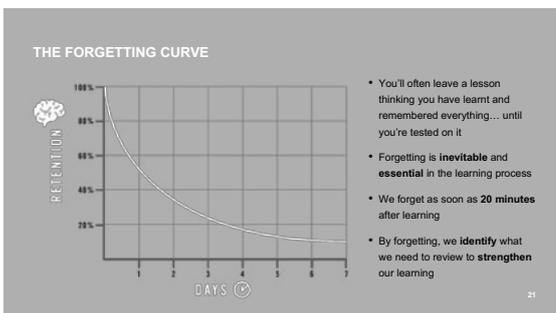
Becoming an expert in an area will create more folders than the average person.

SLIDE 20



Notes: n/a

SLIDE 21



TEACHING POINT

The forgetting curve shows that most of what we learn in a lesson is forgotten quite quickly (especially if our whole day is spent absorbing new information – remember how you feel at the end of an INSET). BUT forgetting is an essential part of the learning process, and when we revisit information we need to know what we have forgotten – this is why personalised learning checklists, textbooks and good quality notes are really important.

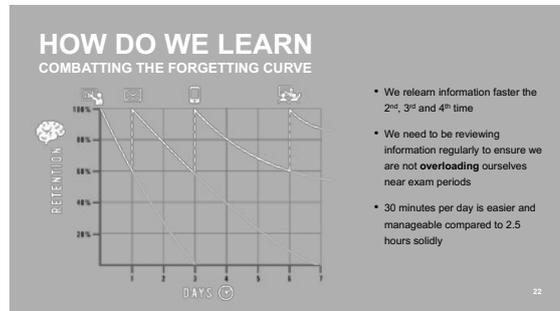
As a teacher how often will your students revisit information before their real exam? How will you know? In the second year of GCSE/A-Level you might like to map the first year's worth of learning on to the second year and set homework to encourage revisiting information.

The forgetting curve tells us that we need to revisit information a number of times (with gaps of perhaps six +) at least four times.

Clearly this will depend on a number of things but what you can't do is take something you learned in a lesson revise it four days in a row

and expect to remember it 18 months later. To learn we need to revisit information several times and with space – 1) lesson, 2) end of unit test, 3) Summer exams, 4) Mocks, 5) final exams + homework.

SLIDE 22

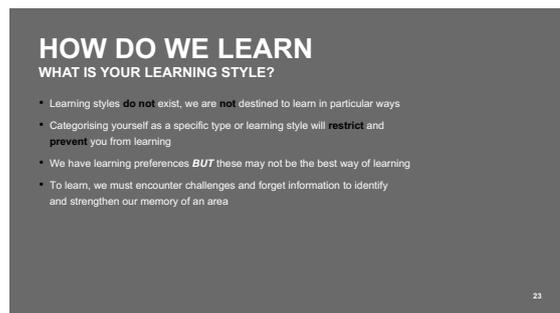


POSSIBLE ACTIVITY

Planning – get students to map onto a calendar their assessment points – how spaced out are they, how often will they get to revisit information, then get them to think what else they need to do to ensure they have revisited information often enough.

Organisation – ask students to think about how will they know what they don't know – have they got good notes, revision guides, personalised learning checklists?

SLIDE 23



NOTE

Please see: www.changingstatesofmind.com/learning-styles-why-they-just-aren-t-a-thing

SLIDE 24

HOW DO WE LEARN

- Learning a topic using both auditory and visual information can create stronger memories. You're processing new information in two ways
- This is called dual-coding

WORKING MEMORY
Thinking, decision-making, problem-solving, morals.

PHONOLOGICAL LOOP
Inner voice and inner ear.

VISO-SPACIAL SKETCHPAD
Inner eye.

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POSSIBLE ACTIVITY

Get students to think of ways that they can create both auditory and visual memories.

SLIDE 25

HOW NOT TO LEARN!

- Re-reading and highlighting notes are the **weakest** ways to learn and revise
- It creates weak semantic memories that aren't linked to wider concepts
- You **will** forget weak memories
- Learning needs to be challenging to be effective

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Notes: n/a

SLIDE 26

WHY CREATE REVISION NOTES?

- You can organise information into meaningful 'chunks'
- You're able to process the information at a more meaningful level – in own words
- You can add in wider-connections to real-life / other topics
- You can identify cues to recall
- You will have a really good tool to help you revise for exams

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Notes: n/a

SLIDE 27

HOW TO NOTE-TAKE IN LESSONS

- Improve your note-taking skills in lessons by using this system
- This helps you think about the information you're writing, whilst giving you space to summarise after the lesson

Combats forgetting because you need to summarise afterwards

Helps you create revision material because you've summarised already

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Notes: n/a

SLIDE 28

REVISION NOTES

HOW DO WE MAKE REVISION NOTES?

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POSSIBLE ACTIVITY

Get students to identify the different ways these notes reflect that they have learned about memory.

How would they make notes personal to them?

What other ways could they present the notes? (see next slide)

SLIDE 29

REVISION NOTES

HOW DO WE MAKE REVISION NOTES?

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Notes: n/a

SLIDE 30



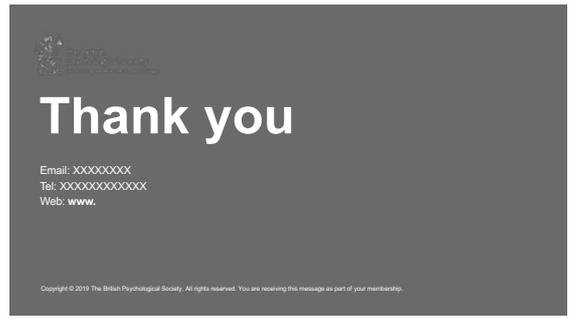
POSSIBLE ACTIVITY

Think about how all the things you have learned may apply to different types of revision techniques?

What should you do, what should you not do?

E.g. Flashcard – cue word on the front, short summary on the back in student’s OWN WORDS with meaningful example.

SLIDE 31



Notes: n/a



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