

The Hamble School

METACOGNITION



THE HAMBLE SCHOOL

ACHIEVING EXCELLENCE TOGETHER



SO FEW PEOPLE ARE REALLY AWARE OF
THEIR THOUGHTS. THEIR MINDS RUN ALL
OVER THE PLACE WITHOUT THEIR
PERMISSION, AND THEY GO ALONG FOR
THE RIDE UNKNOWINGLY AND WITHOUT
MAKING A CHOICE.

~ THOMAS M. STERNER ~

SIMPLE SHIFTS IN POINTS OF VIEW CAN
OPEN DOORS TO EXPANSIONS OF
CONSCIOUSNESS AS EASILY AS RIGID
DISPOSITIONS CAN CLOSE HEARTS AND
MINDS TO SUCH ELEVATED AWARENESS.

~ ABERJHANI ~

METACOGNITION

At The Hamble School we strive to develop a passion for lifelong learning in our students that will remain with them as they move forwards on their learning journey. Evidence gathered by the Education Endowment Fund (EEF) suggests that the use of metacognitive strategies – which get pupils to think about their own learning – can be worth the equivalent of an additional **+7 months’ progress** when used well.

While the potential impact of metacognitive approaches is very high, less is known about how to apply them effectively in the classroom. What is understood, however, is that metacognitive strategies should be taught in conjunction with subject specific content. Research has shown that this yields a stronger impact since it gives students an opportunity to apply strategies in context.

This booklet acts as an initial tool to outline the strategies our students will use to develop an understanding of **metacognition** and **self-regulated learning**. Students can then maximise impact by applying them in the context of a particular topic or subject.

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CHUNKING TECHNIQUE

WHAT IS CHUNKING?

- Technique which can improve your **memory**
- Process of taking individual pieces of information (**chunks**) and **grouping them into larger units**

THE POWER OF CHUNKING TO HELP YOU LEARN

- Your memory system becomes more efficient
- Helps you to recall relevant information in your exams
- Information becomes easier to retain and recall
- Improves your creativity

THE CHUNKING PROCESS

1. Break down large amounts of information into smaller units
2. Identify similarities or patterns
3. Organise the information
4. Group information into manageable units

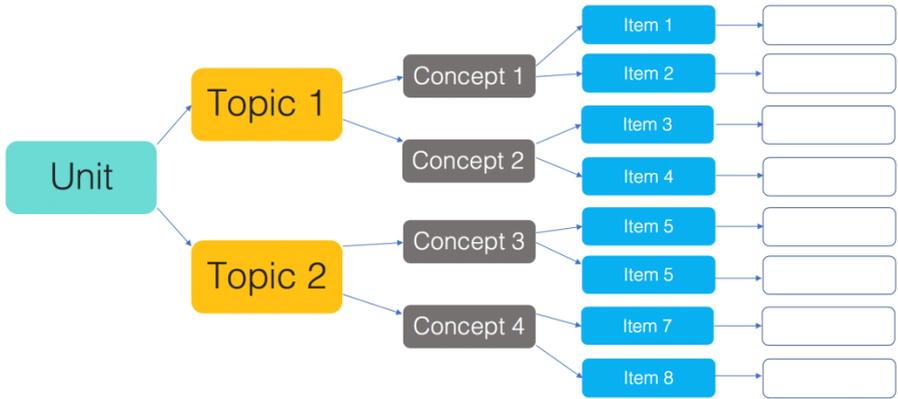
Use **HEADINGS** and **TITLES** for different sections.

Use **TABLES** to summarise **LARGE AMOUNTS** of **DATA**.

Use **BULLET POINTS** to summarise and **CLARIFY IMPORTANT POINTS**.

Combine quick **ILLUSTRATIONS** with **TEXT** to create **VISUAL ASSOCIATIONS**.

AN EXAMPLE OF CHUNKING



ARE YOU READY TO DO SOME CHUNKING?

FOCUS

Chunking requires YOUR attention on the learning.

UNDERSTANDING

You need to fully understand information before chunking material.

CONTEXT

Go beyond understanding the initial problem or concept to see when, where and how to apply it.

TOP TIPS TO EFFECTIVE CHUNKING

1. PRACTICE

- Challenge yourself to remember lists of things:
 - Shopping list, vocabulary words or important dates.
- As you get better at remembering larger chunks of information, continue to challenge yourself to remember even more.

2. LOOK FOR CONNECTIONS

- As you create groupings, look for ways to relate them to each other in meaningful ways.
- Consider what ideas have in common and what makes sense.

3. ASSOCIATE

- Linking groups of items to things from your memory can help make things more memorable.

4. INCORPORATE OTHER MEMORY STRATEGIES

- Use mnemonics as a way to chunk different units of information.
 - Remembering a list – such as buying **figs, lettuce, oranges, apples, and tomatoes**.
 - Create a word out of the first letters – e.g. "**FLOAT**".
- Remembering the keyword supports you in recalling the knowledge represented by each letter of the acronym.

5. SEPARATE YOUR REVISION

- Separating revision into **sections** can help you digest everything and remember it more easily.
- Create **links** between different bits of information.
- Put information into meaningful categories to help you remember.

FORM
PATTERNS

DEVELOP YOUR
TACTICS

MAKE
CONNECTIONS

FLIPPED LEARNING

WHAT IS FLIPPED LEARNING?

- **Pre-lesson preparation**, reflection and questioning that you complete
- Helps to inform a teacher's planning

HOW DOES IT WORK?

- Prior to a lesson a teacher could direct you towards **specific resources** (often online media) to read / watch / review
- You need to **digest and respond** to the resources by producing a piece of work to demonstrate your understanding

WHAT COULD YOUR TEACHERS ASK YOU TO DO?

- Teacher may **tell you what topics are coming up** in the next week for you to complete some pre-lesson work
- Teacher could **ask you to read around an issue** and then use **Thinking Hard** templates to transform your learning
- Teacher gives you **clips to watch** and make notes from

HOW FLIPPED LEARNING CAN HELP YOU?

- You attend a lesson with existing **knowledge and many questions**, ready to further your understanding
- You are in control of your learning and performance
- Improves your questioning skills and ability to support peers
- You become independent with your learning
- Technology can enhance your learning experience
- Lessons become even more purposeful to you
- **More time to discuss complex concepts** during lessons
- **Apply your learning** through problem solving

PREPARATION IS VERY IMPORTANT IF YOU ARE TO GET THE MOST OUT OF A FLIPPED LEARNING OPPORTUNITY

HOW CAN YOU PREPARE FOR FLIPPED LEARNING?

- Research the topic area
- Make notes on the key points
- Watch videos with friends and discuss the key themes
- Complete any pre-class tasks and note down any questions
- Write your own revision questions (with answers)
- Create a mind map showing connections between concepts

BEING PROACTIVE MEANS TAKING RESPONSIBILITY FOR YOUR LIFE AND ACTIONS RATHER THAN JUST WATCHING HOW THINGS HAPPEN

BE PROACTIVE TO MAKE THE MOST OF FLIPPED LEARNING

- Think ahead to the next lesson or topic
- Take action rather than wait for your teachers to tell you
- Focus on prioritising your work
- Set yourself some realistic goals
- Participate actively in your learning and out of lessons
- Stay consistent and be motivated

QUICK GUIDE TO HELP 'FLIP' YOUR LEARNING?

- **FIND** out what your next topics will be – ask your teachers
- **LOOK** out for opportunities to help understand new topics
- **IDENTIFY** key questions to ask in the lesson
- **PREPARE** for next lesson by being proactive – make notes

FLASH CARDS

USING FLASHCARDS

- Using flashcards is a **repetition** strategy
- Simple **cue** on the front and an 'answer' on the back
- Flashcards engage **active recall**

WHY FLASHCARDS CAN HELP YOU LEARN

- They engage in **active recall**
 - Creates connections for you to recall information
- They promote **self-reflection** (aka **metacognition**)
 - Firmly commits knowledge to your memory
- **Metacognition**
 - You take control of your own learning
 - You have to decide what to put on each card
 - You decide how often you're going to use them
 - You evaluate how well you know the information
- They can help you **memorise** facts quickly
- **Drilling**
 - Practise the same information over and over again
 - Practice makes permanent

YOU NEED TO BE SMART WHEN MAKING AND USING
FLASHCARDS TO MAKE SURE YOU ARE EFFECTIVE

HOW TO MAKE FLASHCARDS

1. Ensure flashcards have a **question** or **key term** on one side and the **answer** or **definition** on the other.
2. Ensure the right questions and knowledge are on the cards.
3. Keep information as short as possible.

4. Write clearly so you can read your writing at a quick glance.
5. Use different **coloured cards** or **pens** to group flashcards.
 - For example, use a different colour for each topic.
 - Helps your brain to categorise information better.
6. Make flashcards as soon as you've learned a topic in class.

STUDIES HAVE FOUND THAT IT'S MORE EFFECTIVE TO REVIEW A WHOLE STACK OF CARDS IN ONE SITTING RATHER THAN GLANCING AT THEM EVERY SO OFTEN

BEING SMART WHEN USING FLASHCARDS

1. **Spaced Repetition** – Review your cards at specific, increasing intervals. Spaced repetition works because it activates your long-term memory.
 - For example: Day 1, Day 2, Day 4, Day 8 and so on.
2. **Thinking Pause** – Have a **thinking pause** after picking a card up and reading the question, then turn it over to read the information.
3. **Discard Ban** – When you get an answer right using your flashcard **do not** discard it.
 - Keep **repeating the question** even if you get it right multiple times to keep it in your memory.
4. **Own Words** – Writing answers or definitions you are recalling in your own words, and give examples.
5. **Interleaving** – Once you have several decks of flashcards for different subjects and topics, try mixing them up. This will test your knowledge across subjects in a single session.

USING A SYSTEM TO REVISE WITH FLASHCARDS

The **Leitner System** is a well-known and very effective method of using flashcards. It's a form of **spaced repetition** that helps you to study the cards you don't know more often than the cards you already know well.

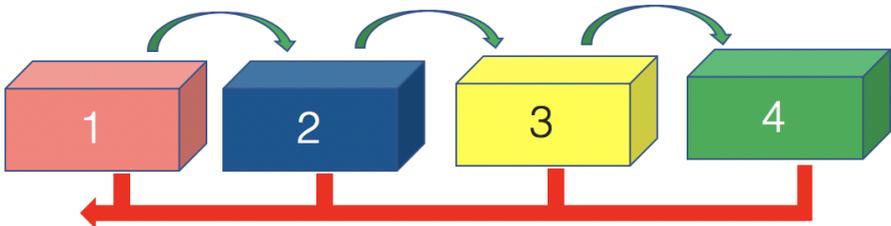
LEITNER SYSTEM – THE METHOD

All flash cards start in Box 1. If you give the wrong answer, the card stays in Box 1.

As you review the cards, each card answered correctly goes into Box 2.

When you review cards in Box 2, if you still get it right you move the card to Box 3.

Repeat until all cards are in Box 4. If you get a card wrong in any box, return it to Box 1.



- The key is that the cards you know less well are reviewed **more frequently** than the cards in the higher boxes.
- You next choose the frequency you review each box.
 - **Box 1:** Every day
 - **Box 2:** Every 2 days
 - **Box 3:** Every 3 days
 - **Box 4:** Every 4 days

INTERLEAVING

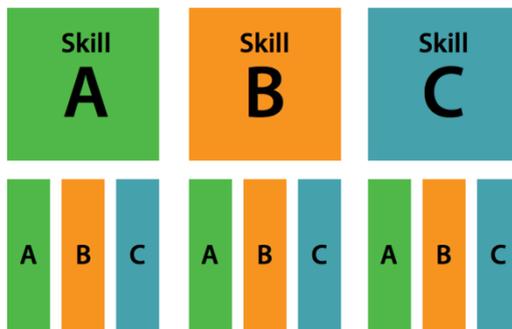
WHAT IS INTERLEAVING?

- Technique to use when revising or reviewing material
- Helps you remember more for an exam
- Helps you understand better
- It is about **what you do with your time** when revising

HOW DOES INTERLEAVING WORK?

Learning is spread **over time** rather than concentrating on a range of topics one after the other.

BLOCKING VS. INTERLEAVING



RESEARCH SHOWS THAT 'MIXING IT UP' BOOSTS LEARNING COMPARED TO MORE TRADITIONAL METHODS OF BLOCK LEARNING WHERE STUDENTS MASTER ONE TOPIC BEFORE MOVING ON TO THE NEXT IN PREPARATION FOR EXAMS.

FOCUS ON QUALITY
AND NOT QUANTITY

WHAT ARE THE BENEFITS OF INTERLEAVING?

- Strengthens memory recall
- Your brain is continually changing focus and attempting to find different responses to draw on short-term memory
- Revisiting material from each topic several times, in short bursts, can increase the amount you remember in exams
- Each time you review it strengthens your memory recall

SHORT TARGETED BURSTS ARE MORE EFFECTIVE
THAN EXTENDED REVISION SESSIONS

HOW TO APPLY INTERLEAVING

1. Break units down into small chunks
2. Split chunks over a few days rather than revising all at once
3. Decide on the key topics you need to learn for each subject
4. Create a revision timetable to organise your time and space your learning

DO LITTLE AND OFTEN,
AND MIX IT UP EVERY DAY

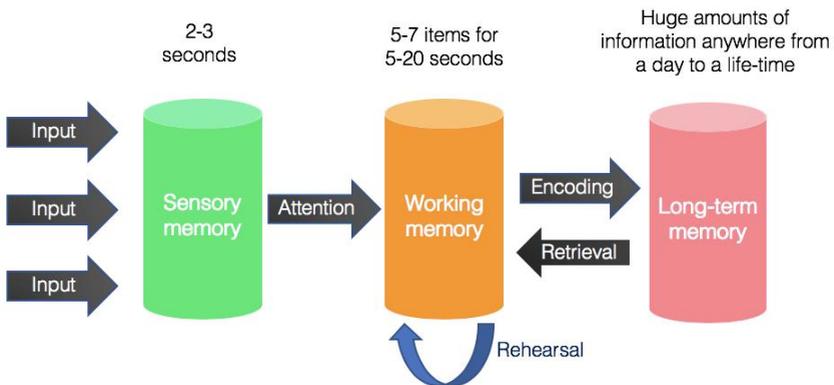
COGNITIVE LOAD THEORY

Cognitive Load Theory was developed by **John Sweller** which is driven by the study of problem solving.

WHAT IS COGNITIVE LOAD?

- Amount of information working memory can hold at once
- The **working memory** is where we **process information** and is key to learning

HOW DO WE PROCESS NEW INFORMATION?



- The capacity of our **working memory** is **limited**
 - We must manage our working memory using strategies.
 - There are **3 types** of **working memory**:
1. **Intrinsic Load** – how complex a task is. If a task or problem is really **complex**, it can take over our working memory.
 2. **Extraneous Load** – these are instructions you are given or how questions are written. Incomplete instructions take up space in working memory and don't help you learn.
 3. **Germane Load** – amount of work you put in to create a permanent store of knowledge.

TOP 10 TIPS TO APPLYING COGNITIVE LOAD THEORY

1. **Chunking** – break the problem down into parts. This reduces the problem space and lightens the cognitive load, making learning more effective.
2. **Modelling** – look at worked examples to understand how to complete tasks.
3. **Resources** – take advantage of auditory and visual channels in your working memory.
4. **Simple** – Start with learning simple information and build on it
5. **Environment** – create an environment with as few distractions as possible; turn off your mobile phone, music or the TV. Distractions add to your working memory.
6. **Prioritise** – avoid overloading your brain with too much information at one time.
7. **Organisation** – always review information from your lessons as you go along. This will help improve your retention and add knowledge to your long-term memory.
8. **Focused** – focus on one task or topic at a time.
9. **Repeat, Repeat, Repeat** – rehearse the components of a complex task so that it becomes automated, thus freeing up working memory capacity.
10. **Stories** – create stories from information that needs to be remembered, or group information into more memorable categories or more accessible chunks.

THE MIND PROCESSES VISUAL AND AUDITORY INFORMATION SEPARATELY. HOWEVER, TOO MUCH TEXT AND VISUAL INFORMATION DISPLAYED TOGETHER COMPETE WITH EACH OTHER IN YOUR MIND

When you have multiple sources of visual information, such as diagrams, labels and explanatory text, your attention is divided between them. This adds to the cognitive load, making it more difficult for you to learn.

TOP TIPS TO HELP YOU REVISE

- Incorporate **labels** into **diagrams**
- Use acronyms to help you learn to retrieve information
- Try talking through a problem out loud
- Watch videos with both animation and voiceovers

HOW WILL USING COGNITIVE LOAD THEORY IMPACT YOU?

- Improve your long-term memory and knowledge retention
- Learn new skills more easily
- Remove unnecessary distractions
- Reduce anxiety and feelings of being overwhelmed

YOUR MEMORY WILL WORK MOST EFFECTIVELY WHEN
YOU ARE NOT OVERLOADING IT WITH INFORMATION ALL
AT THE SAME TIME

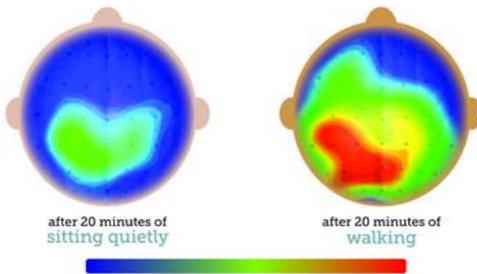
KEEPING ACTIVE DURING REVISION

REGULAR PHYSICAL ACTIVITY CAN AFFECT THE BRAIN

- Boosts your memory
- Improves your concentration
- Helps reduce stress
- Lengthens attention span
- Improves cognitive brain function
- Improves your ability to focus for longer periods of time

PHYSICALLY ACTIVE STUDENTS HAVE ACTIVE BRAINS

BRAIN SCANS OF STUDENTS TAKING A TEST:



Red areas are **very** active.

Blue areas are **least** active.

EXERCISE CAN IMPROVE YOUR EXAM PERFORMANCE

Exercise triggers the release of various hormones and chemical compounds in the body:

DOPAMINE
positively influences learning and your attention span.

SEROTONIN
is involved in regulating your sleep cycles and boosting your mood.

NOREPINEPHRINE
affects motivation and mental stimulation.

IMPORTANCE OF BREAKS DURING REVISION

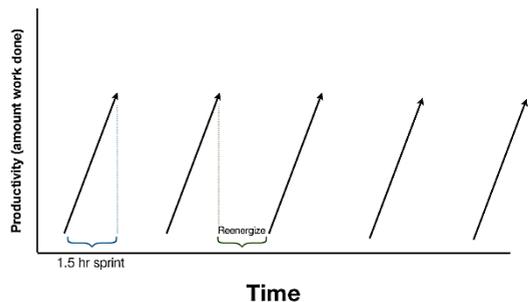
- You're less likely to get distracted while you are revising
- It's much better to spend 60-minutes revising well with 10-minutes on a break than to spend longer than this revising, where you spend half the time revising and half playing with your phone.
- Breaks actually make you work more effectively; after all the mental work you are doing, your brain needs a rest.

HOW CAN YOU BUILD EXERCISE INTO YOUR BREAKS?

- **Schedule regular breaks during your revision.** This could be 60-minutes of revision, followed by a 10-minute break. Exactly what schedule is best varies from person to person.
- Use a break for **something relaxing and refreshing**, but something that won't distract you from getting back to work.
- Do something that **involves getting up from where you're revising and moving around.**

DURING REVISION – WORK IN 60- TO 90-MINUTE INTERVALS

- Your brain uses up more glucose than any other bodily activity.
- Typically, you will have used most of it after 60-90-minutes.
- So take a break, get up, go for a walk, have a snack.
- Do something completely different to recharge.



FIND A ROUTINE THAT WORKS FOR YOU

- **Be flexible** – fit your exercise around your revision timetable, and find what works for you.
- **Shorter intense exercise** – this is great during the exam period as it doesn't take too long to fit exercise in.
- **Take regular walks** – walking regularly during the day will help you stay fresh and active.

EXERCISE HELPS TO OXYGENATE THE BRAIN AND RELEASE TENSION, HELPING YOU TO KEEP CALM, MENTALLY RELAX AND STUDY MORE EFFICIENTLY.

TOP TIPS TO TAKE CARE OF YOURSELF

- Exercise regularly
- Eat well
- Sleep well
- Relax often
- Socialise and connect with others
- Take time out for you

SPACING AND TIMING OF REVISION

WHAT IS SPACING?

- A revision technique which is all about **spacing out your revision** so you don't get swamped and overwhelmed
- It means introducing **time intervals** into your revision sessions as well as spacing out the days which you use to revise for topics
- To commit something to memory, it takes time and repetition

WHY IS SPACING BENEFICIAL?

- Doing something little and often – **spacing** – beats doing it at once, or cramming
- The time in between revision allows you to forget and re-learn the information, which cements it in your **long-term memory**
- Cements information into your long-term memory
- We can learn more information **over time**, rather than in one longer session
- Helps you revise more efficiently

THE BRAIN REQUIRES A PHYSICAL PROMPT IN ORDER TO KEEP SOMETHING IN LONG-TERM MEMORY. OTHERWISE, IT IS DESIGNED TO LET IT GO.

OPTIMUM SPACING

- Research suggests there is an optimal gap between revision sessions so you can retain the information.
- For an assessment in a month, you should review the information around once a week.

Time until Assessment	Optimum Spacing / Revision Gap
1 Week	1-2 days
1 Month	1 week
3 Months	2 weeks
6 Months	3 weeks
1 Year	1 month

CREATE A REVISION PLAN USING SPACING TECHNIQUE

1. **Organisation** – determine where you need to focus your time – e.g. which subjects, topics, learning priorities, etc.
2. **Planning** – map out what you are going to revise and when. Use a timetable or revision planner to do this. Remember to space your subjects as well as subject content.
3. **Review** – build in different revision techniques to help you complete quick 5- or 10-minute reviews of your topics throughout your revision plan.
4. **Transformation task** – These are 30-minute activities to help you take in information. For example, writing summary sheets or creating flash cards or mind maps for topics.
5. **Practice testing** – test yourself on the area that you have reviewed, either by quizzing or testing yourself with a friend.
6. **Exam questions** – complete an exam question or on the area you have reviewed and mark this yourself, using a mark scheme

FIVE HOURS OF TIME SPENT IN SMALLER CHUNKS AND SPACED PERIODICALLY IS A FAR MORE EFFECTIVE WAY TO LEARN SOMETHING THAN FIVE HOURS A NIGHT BEFORE

TOP TIPS TO MANAGE YOUR REVISION TIME

1. Know what your **revision goals** are and **set aside blocks of time**
2. Don't work too much – **work smarter, not harder**
3. Establish **good habits** and a structured **revision routine**
4. **Don't procrastinate** – don't waste precious time worrying or thinking about what to do – **just do it**
5. **Review** your work – **prompt your brain** with short review exercises

TO COMMIT SOMETHING TO MEMORY,
IT TAKES TIME AND REPETITION

~ NOTES ~



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Reception is open during the school term from
8am until 4pm from Monday to Thursday and 8am until 3.30pm on Friday.