Jesmond Park Academy

Effective strategies and techniques for revision.

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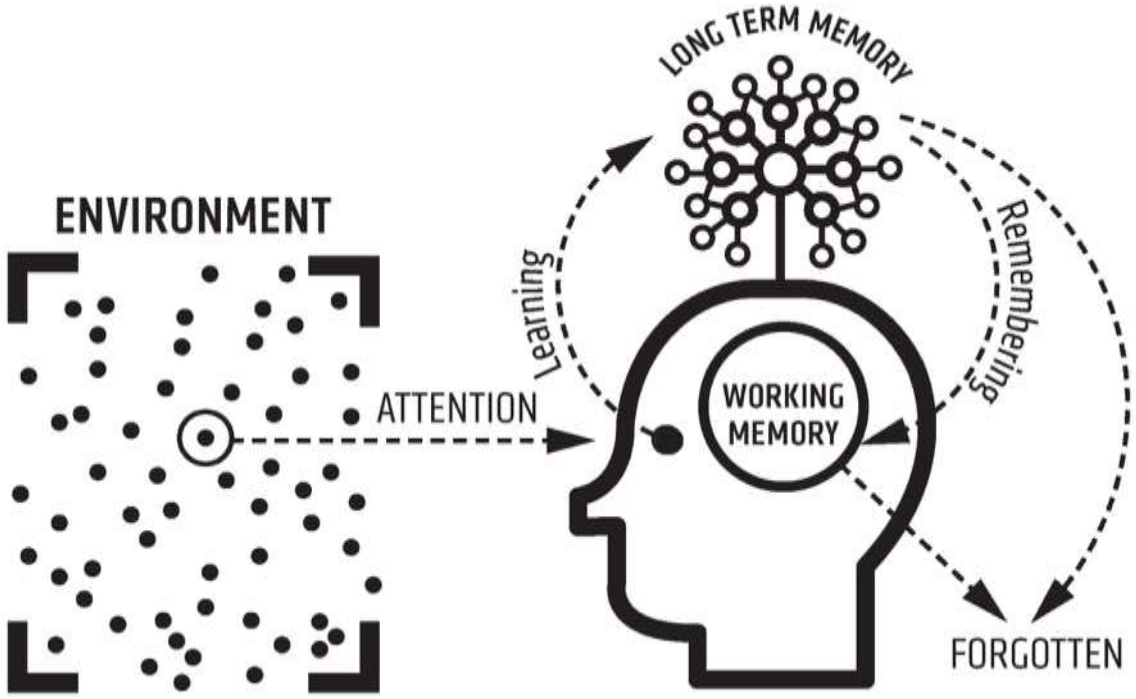
Memory – the science of learning

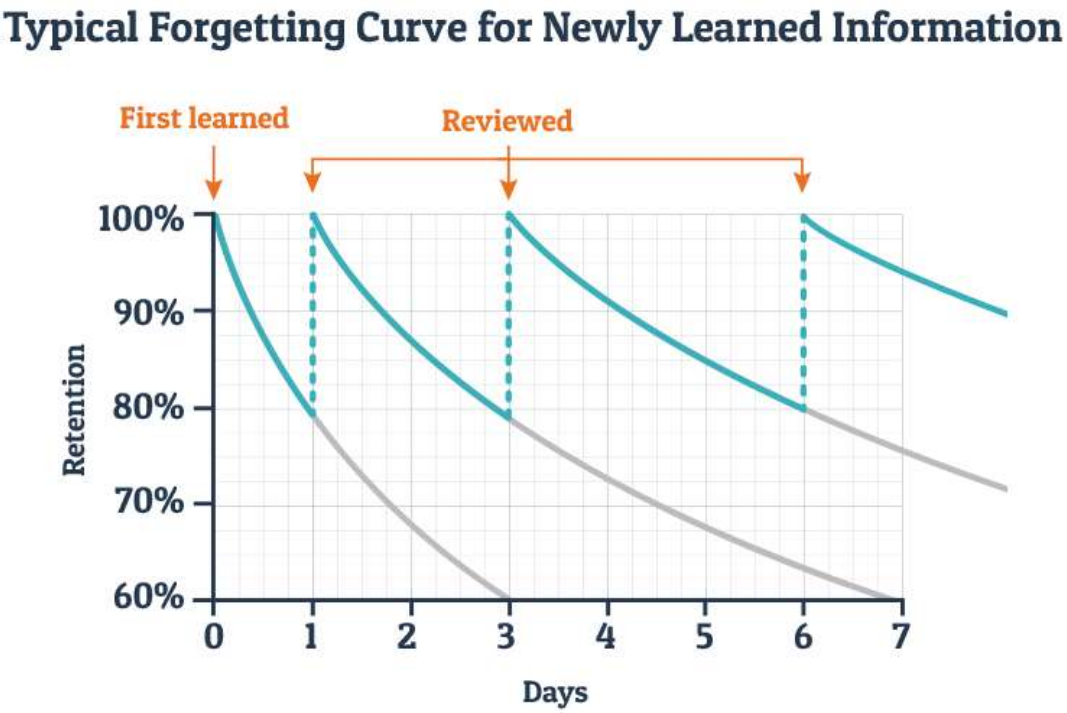
In recent years, there has been lots of research around the science of learning and how we learn and retain information.

In summary, if we think of the learning process using the following diagram, it will help us have a greater awareness of the most effective revision strategies based upon the available research.



1. We have a certain amount of attention to pay and this can be limited and can dramatically vary depending on the individual or the environment. In the diagram above, '**attention**' means we acknowledge new information and this is then transferred into our working memory.
2. Our **working memory** is finite and we can only absorb a limited amount of information at a given time. This may be up to 30 seconds. *As an example, if you write down a 'long number' and try and remember it every 30 seconds, you will be surprised how difficult this is to do!*
3. Information is processed into our **long-term memory** through '**learning**'. This long-term memory is effectively unlimited, and we can retrieve information from here back into our working memory as needed in a given moment. *As an example, this might be your phone number or address. We don't walk around thinking about those two things every second of the day but it is in our long-term memory ready to be used and retrieved when needed.*
4. Information in our **long-term memory** is interconnected and linked with prior knowledge. Anything that is not connected or not successfully stored well enough in our long-term memory is forgotten and this is completely natural.
5. If students undertake enough **retrieval practice**, generating the information in our long-term memory, it increases a level of fluency within the subject. Practice makes perfect!

As stated above, forgetting is completely natural. The following diagram outlines this process and is called the **Ebbinghaus Forgetting Curve** (1885).



Ebbinghaus proposed that humans start losing 'memory of knowledge' over time unless the knowledge is consciously reviewed time and time again. He conducted a series of tests on himself which included the memorization of a meaningless set of words. He tested himself consistently across a period of time to see if he could retain the information. He found that:

- **Memory retention is 100% at the time of learning any particular piece of information (in the moment). However, this drops to 60% after three days.**
- A range of factors affect the rate of forgetting including motivation, the meaningful nature of the information, the strategies for revision and also psychological factors (sleep for example).
- **If each day, repetition of learning occurs and students take time to repeat information then the effects of forgetting are decreased.** According to research, information should be repeated within the first 24 hours of learning to reduce the rate of memory loss.

In summary, what do we know about **memory**?

- Consistent practice and revisiting previous material strengthens memory and boosts learning.
- Information, if not revisited, is 'lost' from our memory.
- Our working memory is finite and limited and so overloading this or cramming for revision doesn't work.

The key principles of effective revision

Therefore, let's explore a number of different strategies to ensure your revision is as effective as it can be.

Retrieval Practice

Simply put, recalling information from memory is simple and powerful. Retrieval practice is a learning strategy which makes you think hard and brings information to mind. It is the action of actively retrieving knowledge that boosts learning and strengthens memory. **It means trying to remember previously learned information as opposed to simply re-reading it**. Examples include:

- Knowledge quizzing and low stakes testing.
- Multiple choice tests.
- Completing past paper questions or practice answers.
- Answering verbal questions asked by teacher/peers/parents.
- Creating flashcards or revision materials where you can 'test' yourself.

One particularly effective strategy is the creation and use of **flashcards**. Flashcards are generally a card containing a small amount of information as an aid to learning. The use of flashcards are for low stakes testing to improve recall and to strengthen memory.

An effective flashcard may include the following (*in each subject they will be used in a different way*):

- A key term/key word with definition on the back.
- A key date with the event on the back.
- A key equation with its use in practice on the back.
- A past paper question and a model answer on the back.

In order to use flashcards most effectively, the **Leitner System** is a desired strategy. Once you have created a set of flashcards, create three boxes/areas marked as the following.

BOX 1: Every day	**BOX 2:** Twice a week	**BOX 3:** Once a week

- Test yourself on the flashcards in the Box 1 pile. If you get the answer correct on the flashcard, move it to the Box 2 pile. If you get it incorrect, it stays in Box 1.
- Twice a week, test yourself on the flashcards in Box 2. If you get the answer correct on the flashcard, move it to the Box 3 pile. If you get it incorrect, it stays in Box 2. The aim is to get all of the flashcards to Box 3.

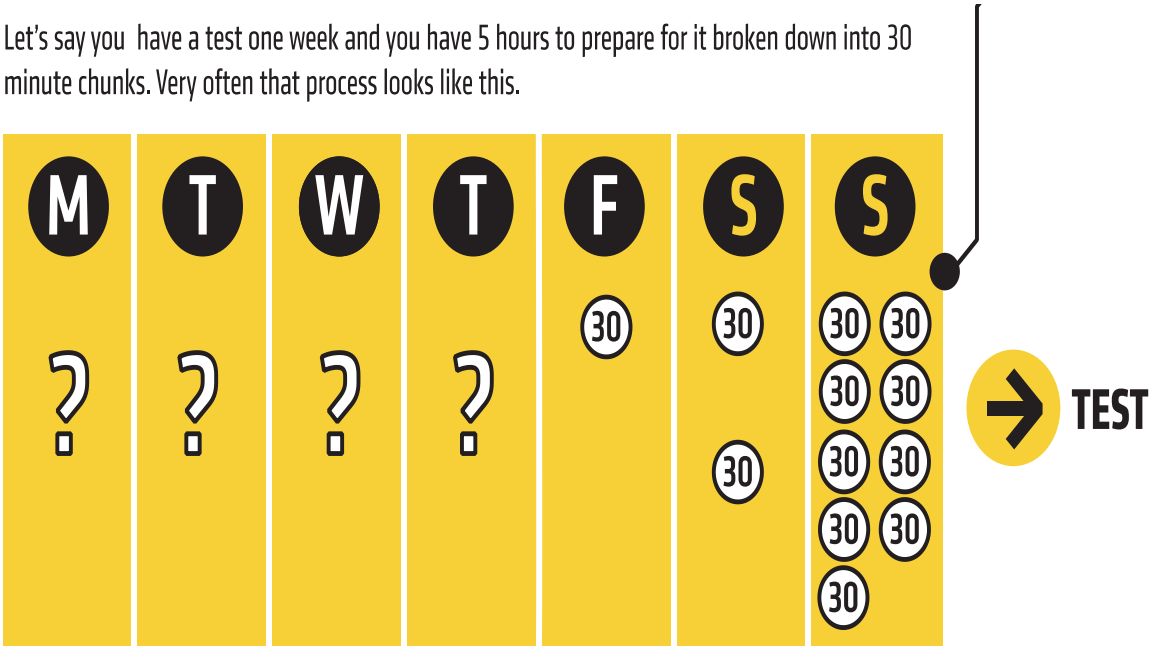
This video will help support you in using the Leitner system:
https://www.youtube.com/watch?v=C20EvKtdJwQ

This diagram will also further support your implementation of the **Leitner System**.

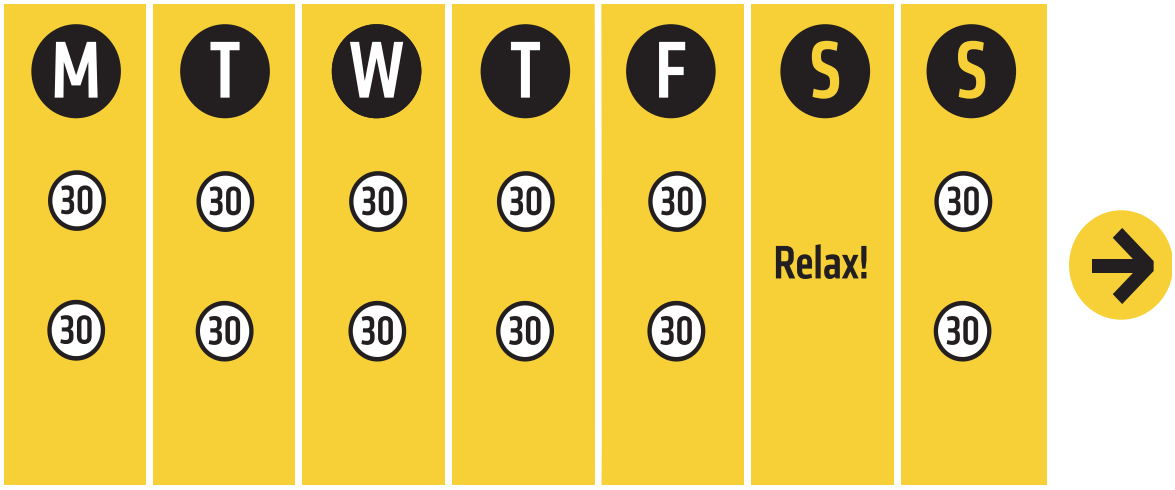
Spacing and Interleaving

Spacing out your revision into smaller chunks over a period of time helps you to remember the material better and ensures you are less stressed with your revision.

Let's say you have a test one week and you have 5 hours to prepare for it broken down into 30 minute chunks. Very often that process looks like this.



Instead of mass practice, a much more effective way of revising is to space out your revision like this:



By breaking up your revision into 30 minute chunks and spacing out the time between revision, you will consolidate what you have learned and retain the material much more effectively.

Interleaving involves switching between ideas and topics during a study session. This ensures that you are not studying one idea or topic for too long. Mixing up your revision and chunking it supports learning and strengthens your memory.

> *As we have seen with spaced practice, leaving gaps between studying is very effective but what if you are studying multiple topics within a subject? Interleaving means mixing it up and not studying all the material at once.*

For example, instead of organising your revision week like this:

M	T	W	T	F
MACBETH	AN INSPECTOR CALLS	CREATIVE WRITING	UNSEEN POETRY	JEKYLL AND HYDE
MACBETH	AN INSPECTOR CALLS	CREATIVE WRITING	UNSEEN POETRY	JEKYLL AND HYDE
MACBETH	AN INSPECTOR CALLS	CREATIVE WRITING	UNSEEN POETRY	JEKYLL AND HYDE

A much more effective way of organising your revision would be like this:

M	T	W	T	F
MACBETH	UNSEEN POETRY	AN INSPECTOR CALLS	JEKYLL AND HYDE	CREATIVE WRITING
AN INSPECTOR CALLS	JEKYLL AND HYDE	CREATIVE WRITING	MACBETH	UNSEEN POETRY
CREATIVE WRITING	MACBETH	UNSEEN POETRY	AN INSPECTOR CALLS	JEKYLL AND HYDE

As you are doing this, another highly effective strategy is to try to think of connections between topics you are studying considering similarities and differences.

Studying one topic for a long time can give them impression you have mastered it but often this can be misleading.

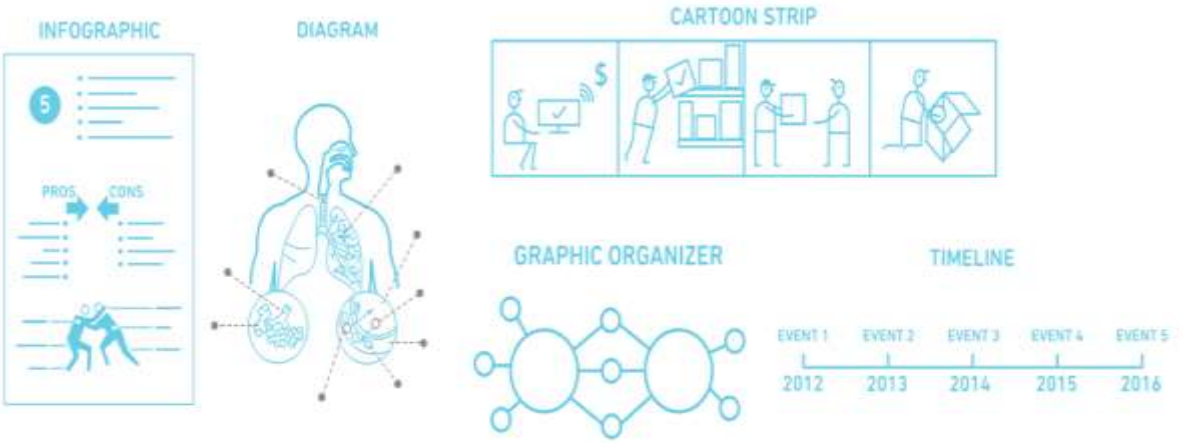
Deliberate Practice

This follows a simple process to support your revision. Start by spending time reviewing a topic/unit before quizzing/testing yourself **with no notes and from your memory (this is vital for revision)**. Once you have finished, check your answers. **This will support you in showing where your 'knowledge gaps' are and where focus needs to be in your future revision**. Revision shouldn't keep you in your comfort zone, you need to be thinking hard and identifying your own areas for development. Avoid simply revising topics you enjoy. A technique to support deliberate practice is the **Pomodoro Technique**.

Dual Coding

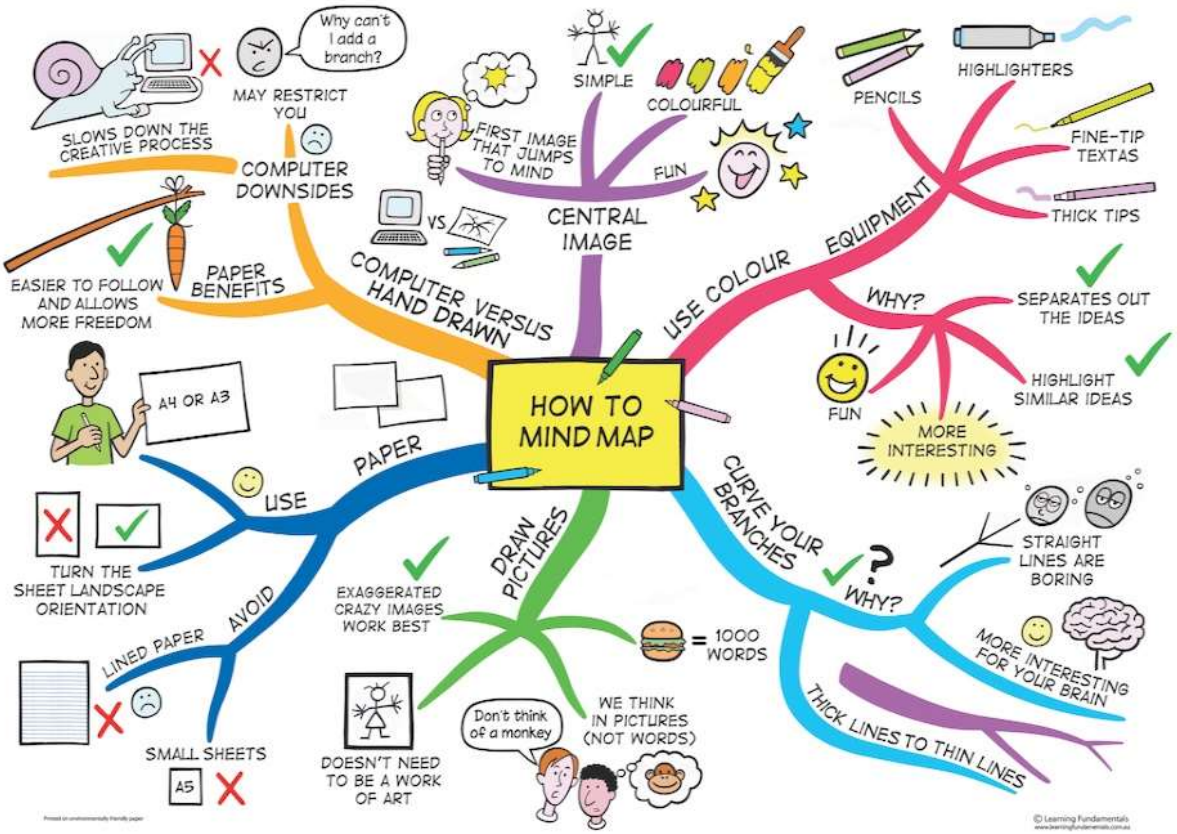
When reviewing something you have learnt, combining words and pictures can be powerful.

Examples of this include creating a:

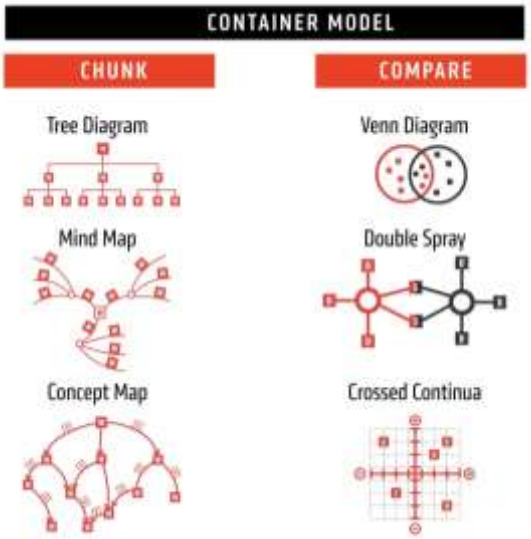


Mindmaps

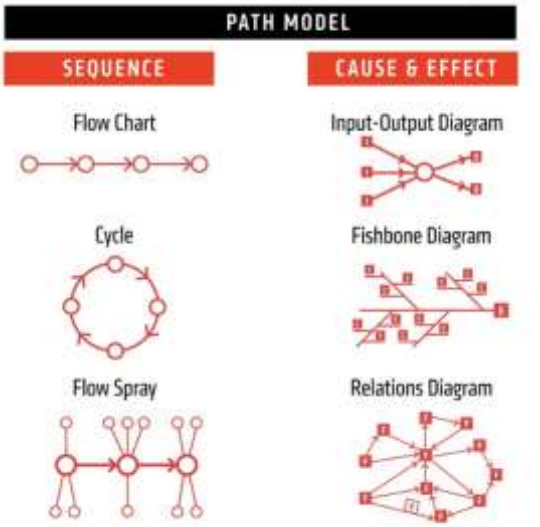
These are a visual way of representing lots of information on a topic by breaking into 4-6 subheadings. They have been shown to aid memory



Graphic organisers for chunks of info



Graphic organisers for sequences



Ineffective revision strategies

With the above in mind, it is vitally important to think about strategies that students may employ that have a limited or no real benefit on learning or memory. These include:

- Simply writing out notes or copying from a textbook/exercise book.
- Reading and doing nothing with the information. Trying to focus on 'too much information' on a single page and cramming revision.
- Highlighting information for the sake of it.
- Not enough silent work or attention to a given task. Attempting to revise while multitasking and doing other things.
- Comfort zone revision of easy material that pupils have already mastered because it makes you 'feel good'.

The importance of Habits and Routines

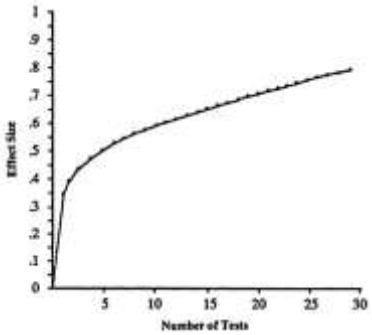
Within your revision, it is vitally important to establish a strong routine. Having goals are good for setting a direction. What do you want to achieve in *this* revision session?

In order to support the forming of good revision habits, there are a number of areas to consider:

- **Start small and build up** – reduce distractions where and when you revise and get your family to encourage the creation of a revision timetable and placing it somewhere visual in your house. Ensure someone else is knowledgeable of this timetable to enable accountability and aid support.
- **Make it attractive** – collaborative focused revision is beneficial (alongside attending interventions or revision sessions) but you could also ensure there is a 'reward' at the end of a revision session. *If I complete this, I can do this.*
- **Make it satisfying** – challenge yourself, track your own revision progress and ensure you stick to your revision timetable. Small steps build success and motivation. Use PLCs or checklists to support.
- **Make it obvious** – revise in one area, leave your materials out ready to support organisation and ensure routines are stuck to. Ensure your environment is clear, uncluttered and comfortable.

The Five Step Study Plan

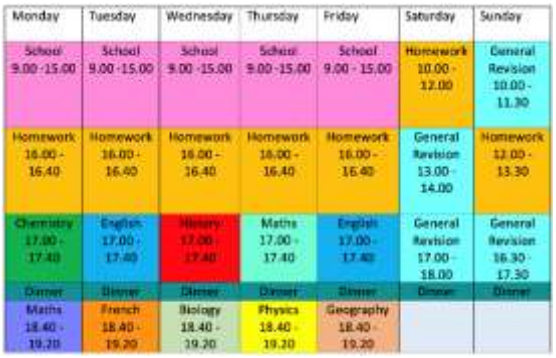
Lots of self-testing and quizzing is essential to improve progress



Revision Timetables

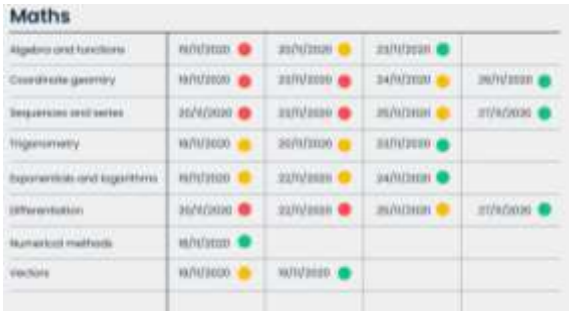
Set out the subjects weekly 'slots' (colour code them)

Day	8:30 – 10:00	10:00 – 11:00	11:00 – 12:00	12:00 – 1:00	1:00 – 2:35	2:35 – 4:00	4:00 – 5:00	5:00 – 6:00	6:00 – 7:00	7:00 – 8:00	8:00 – 9:00	9:00 – 10:00
Monday						English	RE	Break	Music	English	Relax	Relax
Tuesday						Science	Break	Break	Maths	Geography	Relax	Relax
Wednesday						Break	Geography	English	Break	Maths	Music	Relax
Thursday						Maths	Science	Break	Business Studies	Relax	Relax	Relax
Friday						Play football	Break	English	Break	Maths	Business Studies	Relax
Saturday	Science	Maths	Geography	Science	Football	Football	Football	Football	Relax	Relax	Relax	Relax
Sunday	Geography	Football	Football	Relax	Relax	Science	maths	Break	Geography	RE	Relax	relax



Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
School 9.00 -15.00	School 9.00 -15.00	School 9.00 -15.00	School 9.00 -15.00	School 9.00 - 15.00	Homework 10.00 - 12.00	General Revision 10.00 - 11.30
Homework 16.00 - 16.40	Homework 16.00 - 16.40	Homework 16.00 - 16.40	Homework 16.00 - 16.40	Homework 16.00 - 16.40	General Revision 13.00 - 14.00	Homework 12.00 - 13.30
Chemistry 17.00 - 17.40	English 17.00 - 17.40	History 17.00 - 17.40	Maths 17.00 - 17.40	English 17.00 - 17.40	General Revision 17.00 - 18.00	General Revision 16.30 - 17.30
Dinner	Dinner	Dinner	Dinner	Dinner	Dinner	Dinner
Maths 18.40 - 19.20	French 18.40 - 19.20	Biology 18.40 - 19.20	Physics 18.40 - 19.20	Geography 18.40 - 19.20		

Space (revisit regularly) the topics and Interleave (mix up different topics) in each session



Monday	Tuesday	Wednesday	Thursday	Friday
Topic 1	Topic 4	Topic 2	Topic 5	Topic 3
Topic 2	Topic 5	Topic 3	Topic 1	Topic 4
Topic 3	Topic 1	Topic 4	Topic 2	Topic 5