REVISION TECHNIQUES THAT WORK

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Revision techniques that work

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Welcome to the Longsands Sixth Form revision advice guide. This guide was first written in 2016 and this fourth edition has been updated to reflect new research and the changes to the Sixth Form in 2021.

This guide includes details of revision techniques that work. They have all been tested under laboratory conditions and then in field studies. Each technique has been tested against the following measures:

- Speed of recall – how quickly you can remember something
- Accuracy of recall – that what you remember is correct
- Amount of recall – how much you can remember
- Duration of memory – how long the memories will last

Why do some revision techniques work?

Effective revision techniques share certain characteristics:

- They require you to use the information in an effortful way. For example, looking through your notes requires minimal effort and does not use the information in any way that requires actual effort. In contrast, completing a past paper, under timed conditions, uses the information in a very effortful way. Increasing the effort of a revision task will mean that your brain is pushed to create a stronger and more permanent memory.

- The task requires the recall (remembering with no help, e.g. no notes or books) of information and not just recognition (knowing you have seen something before).

- They encourage reflection on how much and how well you know something. This is called meta-memory, which means you reflect not just on what you know but how confident you are that the knowledge is correct, that you know it well, and that you know how to use it.

- Processing the information at a deeper level of understanding leads to stronger memory connections. Deeper levels of processing are where you think about and reflect upon the meaning of the information (e.g. I think 'this' means 'this' to me and I can see how it influences my life through…). Shallow processing looks at very basic information, like colour, and doesn't require any real thinking or effort.

Three important notes about learning

Note One

There is a large difference between recognising something and being able to recall that same information under exam conditions. Some people confuse recognition with recall and think that because they recognise something they know it well enough for the exam.

- Example of recognition: while looking through a book you recognise the information in a topic and think 'I know that' (this does not mean you 'know' it well enough for an exam).
- Example of recall: being able to remember information without any cues (this is what exams test), for example, listing what you know on a blank piece of paper.

Note Two

Another important difference is that between knowledge and wisdom. When you are preparing for exams, especially at A-level or Level 3 BTEC, a significant number of marks can come from questions testing the use or application of knowledge.

Knowledge: learning facts and information related to a subject.

Wisdom: knowing the facts AND how to use them.

Example: In the Psychology A-level, a third of the marks come from the application of knowledge. Each student needs to learn the different treatments for OCD, their strengths and their weaknesses. Then they also need to apply this information to a scenario and explain how each treatment can be used and any issues that might arise because of the specific circumstances described in the scenario.

Note three

Try to be as organised as you can with your learning. Your brain stores information in a very organised way. If you organise your revision into subjects, topics and subtopics and make sure that you have learnt what the structure is for each subject, you will find it much easier to recall the information in the exam. Multiple research studies have found that organising the

information you are learning increases the accuracy of your recall for that information at a later date.

If you imagine that your memory system is like the most complex filing system ever created, you will be heading in the right direction. If you try to store a file in the filing system by simply looking at the file and then throwing into a draw at random, you will struggle to recall the information, because while you have learnt it, you have not stored it in a place that it will be easier to find.

Most subjects that are learnt in school have been organised into topics and subtopics. For example, the Psychology A-level includes, Social, Memory, Attachment, Psychopathology, Biopsychology, Schizophrenia, Aggression, Relationships, Approaches, Issues and Debates and Research Methods. Each of these topics then has several subtopics. For example, the Social topic has eight subtopics and these can be learnt very quickly.

Many students do not take the time to learn the structure of the subject they are trying to master. It can seem like additional information to learn when there is not enough time to learn everything. However, learning the structure does not take very long, and, once it has been learnt, the structure helps you to organise your memories, and this makes information easier to recall in the exam.

Technique 1. Spaced repetition (and retrieval practice)

Some students find that they leave revision until the last few weeks before their final exams. This means that they often only have the opportunity to study each topic once or twice before their exams. This sort of "cramming" can be useful for filling in last minute details but it will mean that an awful lot of material is forgotten. The subjects studied in the Sixth Form contain so much more information than at GCSE, it is unlikely that a student who relies solely on cramming will successfully remember the material.

Research conducted over the last 150 years has shown that the memory system starts to forget information as soon as it has been learnt. In some cases, 95% of the material is lost within 24 hours. However, psychologists have also learnt that there are several strategies that students can use to maxmise the amount of information retained over a long period of time.

To create long lasting memories, we need to return to material frequently. The reason for this is that each memory our brain stores uses energy. To save energy, the brain actively deletes connections that are not being used or that have not been tagged as important. Research suggests that importance is indicated by information being personally relevant or having an emotional. This means that any information that is not frequently used, personal or that the person has found particularly boring has a higher chance of being deleted to save energy. Every time we go to sleep two key things happen, the first is that important memories are strengthened and the second is that memories that are not important are removed.

Examples from the real world

When learning a piece of guitar music I find a big difference between music I play throughout the year and seasonal music. The music I play throughout the year, with spaces between repetitions is much easier to remember and some pieces that I learnt as a teenager I still remember very well thirty years later. Pieces of music that I learn for Christmas, I often find I have to relearn each year. I play the pieces for a couple of weeks and because the repetitions are not spaced out enough, I forget them. The music played throughout the year has by chance been practiced sing spaced repetitions and the Christmas music has been practiced through cramming.

A similar effect can be seen when students cram for their exams in lower school. A student crams over two weeks for their end of Year 10 exams. They know the material really well for the exam and achieve a grade 7 (GCSE). However, following the exam they do not return to the material, as it has been “finished”, and by September the student has forgotten nearly all of the material and would no longer be able to achieve even a grade 5.

The need for spaced repetitions can be summarized as “use it or lose it”.

If multiple repetitions are spaced out over a longer period of time, each repetition tells your brain that the information is important. By increasing the spacing of the repetitions, the brain is pushed to build an even stronger and long lasting connection until the material effectively becomes permanently stored.

How:

Learn a topic on day 1.

Then, the next day, test yourself and fill in any gaps.

Test yourself again a week later and fill in the gaps again.

Then test yourself a few weeks after that and you should find that you remember more of the information.

Retrieval practice:

When practicing the information at different spaced repetitions it is helpful to use retrieval practice. This means that you use the information in a way that is effortful and similar to the way that it will be used in the final exam. If you only use “recognition”, e.g. looking at your notes, the information has not been used actively and your brain will not class the information as important.

Technique 2. Blank page method

This is very useful technique for testing your knowledge AND pushing your brain to build stronger memories. The blank page method is easy to do; all you need is a blank piece of paper and two different coloured pens.

This technique will help you to identify what you can easily remember and what you do not know well enough yet. Everything you write down will have been through recall and by its very nature the task is effortful. The aspect of learning that is missed when using this technique is wisdom, as you will not be applying the information in any way.

Make the most of this technique by testing yourself several hours after you have revised a topic. It will be even better if you leave it to the following day.

How to:

Choose a specific topic you would like to revise. Set yourself an amount of time. I find that 15 minutes will do for most A-level topics.

With the paper in front of you, write down everything that you can remember from the topic. It can help to create columns for any subtopics:

Biological explanations	Evolutionary explanations	Frustration aggression	Social learning	Deindividuation	…

Then keywords, studies, theories, dates, researchers, theorists, authors, battles etc. are written in the column below.

You are aiming to be able to recall all of the major features of the topic within the time period you set yourself. If you find that you had far too much time, reduce the time for the next practice.

When you have finished, use your notes, or a checklist provided by your teacher, to go through the material and add in what you have missed out (it helps to do this in a different coloured pen).

Technique 3. Method of loci

A very powerful way of establishing long lasting memories through the use of lots of connections between the information you need to know to different locations, people, objects, colours, noises, smells, and anything else you can think of. The effort put into creating the multiple connections and making the information organised make this technique very effective. Plus, you also have to practice the Method of Loci several times which builds in spacing repetitions

Method of Loci: the basics

Step 1: You need to create a list of all of the things you are going to learn. Split the list into sections so that each section contains between 6-15 items. Each item is a 'chunk' of information and could cover a researcher and their results, or a historian and their key points.

Step 2: Pick a location with enough rooms to place all of the items in different places. The location should be somewhere you know really well. You are going to practice thinking of each item in that location until it becomes a permanent memory.

Step 3: For each item create a small story that takes place in the location. Try to make what is happening as vivid as possible. Using all of your senses: colour, sound, smell, taste, and touch will make extra connections. The more detailed you make the story for each item the more likely it is you will remember the item. You can also try to create a story that is weird and strange. The weirdness makes the information easier to remember.

Step 4: Draw a map of the location and label where things have been placed. This helps you to build up a more complete memory of the Loci and the items.

Step 5: Always move clockwise around each room in your Loci as sticking to one direction makes it easier to know where you are.

Step 6: Once you have created your Loci practice it at least once a week for a month and very quickly you won't need any notes. Try teaching your Loci to a friend, this has been very successful for many of our students.

Example of a method of loci in Psychology:

I close my eyes and imagine that I am standing by the doorway in the house I grew up in. To my left is Donald Duck eating a Muller yoghurt. Donald is really enjoying the yoghurt and is saying "mmmm, I love food". I look beyond Donald and I see standing next to the sofa, Principle Skinner from the Simpsons. Skinner is singing opera. When the audience in front of him applauses he smiles and sings another song. Then the audience begins to *boo,* and Skinner stops singing. Just then a man riding on a giant dog crashes into the classical orchestra. The man is holding onto reins that are attached to glass tubes that enter the dog's cheeks.

Donald Duck eating Muller yoghurt = Dollard and Miller who wrote the Learning Theory of Attachment which is based on food.

Principle Skinner singing opera = Skinner is the researcher who created the *theory of operant conditioning*; where, if you reward a behaviour, it is more likely to occur again and if you punish a behaviour it is less likely to be repeated.

Man on the giant dog = Pavlov is the researcher who created the *theory of classical conditioning* and famously discovered this form of learning whilst studying salivation in dogs.

Technique 4. Mind maps

A graphic technique that is very effective if the correct amount of effort and time is invested. This technique takes more effort than you might have previously been told.

A mind map can be called a mind map when you can recall the whole thing by closing your eyes and thinking about it – it literally is in your 'mind'.

If you draw the mind map out once and occasionally look at it what you really have is a diagram.

Mind maps are good for learning the structure of a topic and showing which topics are closer together. Links can also be drawn between different subtopics.

How:

It takes effort and practise to embed a mind map in your memory – often at least three copies of each mind map will need to be created for the information to become long lasting.

Each version would normally be more complicated than the last

> *The first version* might be a simple mind map with the keys words.
>
> *The second* might include colours you have carefully chosen with slightly more detail written with each heading.
>
> *The third* usually includes colours and pictures (to help push your brain to make more connections).

Then the mind map is practised on blank pieces of paper until you can accurately recall the whole mind map at least a week after you last tried to learn it.

Technique 5. Revision cards

These are a good technique because they are portable and can easily be given to a friend/parent to test you.

Try to avoid writing whole essays on them – three key points is a healthy amount to put on a revision card.

How:

Perhaps the best technique is to write the name of a key theory/definition/fact/event on one side and then on the other the three or four key pieces of information you should know for the exam.

This allows you to test your own knowledge and to let someone else test your knowledge.

The testing part is essential to making revision cards work. If you do make some revision cards, try to ensure that you use them, just making the cards will not lead to that much additional learning. Similarly, just looking through the cards only uses recognition and not recall. You really will need someone else to test you.

If you want to push your brain to make stronger connections make sure you leave at least a day (a few days and up to a week would be better) between looking at the cards and testing your memory for the information.

Android and iPhones both have apps available that will allow to create electronic versions of revision cards. These can be very helpful if you want to test your self on the go, for example, sitting on the bus on the way to and from school, could be an hour's worth of revision time every day.

Technique 6. Socratic reading

Socratic reading is a reflective process where you carefully analyse the information in a text to see if you understand it, if you agree with it, and to see if it fits with other knowledge that you already know.

This technique can maximise what you can learn from reading. Often a student will try to read something as quickly as possible, they will skim the text to try and find the important information. The problem with skim reading is that it is not effortful and will not trigger long last memory formation.

By slowing down the reading process, the aim of Socratic reading is to get as much understanding out of the text as possible. This takes longer but you save time because you do not have to keep re-reading the same passages.

Part of Socratic reading is writing small questions in the text as you think of them. Sometimes these questions are accompanied by your thoughts and answers to the question. You might also note down on the text how the material has made you feel.

How:

Read the text using a Socratic approach the first time and note down questions, links to other topics and sections that you do not understand in the margin.

Then read the text a second time and this time make notes in your own words. Try to answer any of the questions that you noted during the first reading.

If there are any sections that you are not sure about, ask your teacher in your next lesson.

Technique 7. Annotating your work (and metacognition)

Similar to Socratic reading, annotation of your work is part of a reflective process where you engage with your own writing or work.

You might note down on a piece of work which parts you are confident about and which parts you are worried about.

You might note those sections where you think your knowledge is inaccurate.

This process of reflection encourages your brain to form connections for the knowledge and helps to build self-understanding and awareness. In science we call this metacognition: not just knowing facts but also having an awareness of how confident you are that the facts are correct.

Developing a good understanding of the expertise you are developing helps you to identify the links between topics and have a good understanding of where the weaknesses are in your learning.

Tackling the weakest areas of your knowledge is one of the fastest ways to improve because these weak areas are often the foundation for harder topics. Once you have mastered (ability to recall and use) the foundation information, anything that is harder and requires the foundation knowledge will itself become easier. This also reduces the cognitive load you experience while working on the harder material.

Cognitive load

Our brains have limited capacities and each piece of information we try to remember in our working memory (conscious memory) uses up some of the capacity. The better we know foundation material, the less capacity it needs, and the more capacity is left for working out the harder aspects of a question.

When a student is struggling with a hard topic, they can often make faster progress if they make sure that the foundational information for the topic has ben fully mastered.

Technique 8. Acronyms and acrostics

These offer a variety of ways of remembering simple lists in an order.

One common example of an acrostic is *Richard of York gave battle in vain* for the colours of the rainbow. The first letter of each colour is used as the first letter of each word in the sentence.

An acronym for the colours of the rainbow is *Roy G Biv*. The first letters of each colour have been used to create the name of a man.

Acronyms and Acrostics can help students to learn important lists of information. I suggest that you should avoid trying to use these as your main method of revision as you can end up with lots of overlapping concepts.

How:

Ask your teacher if there are any that they know of for the subject because there is a good chance, they already have some that you can borrow.

It is probably safe to have two or three acronyms/acrostics per topic. Identify a list that you need to know and then see what you can make from the first letter of each word.

The acrostics/acronyms will need to be practiced because they are easier to forget if you do not build in repetitions.

Technique 9. Past exam papers under exam conditions.

Frequent practice of past exam papers under timed conditions meets all of the criteria for creating long lasting memories.

The bonus is that you also develop an understanding of the exam questions and how to use the information.

It is also worth noting that examiners can only set a certain number of different questions on set topics. This means that if you have attempted the past papers, you might have already seen some of the questions that could come up in your real exam and you will have seen many other similar questions.

How:

Download the past papers from the exam board website, if they are not available on the school intranet. It is also worthwhile downloading the mark schemes as these will help you to develop what researchers call 'test-wiseness'.

Set aside enough time to complete a past paper under exam conditions. Do not use notes or the textbook as this will mean that you brain has to make a lower effort which leads to fewer memories being stored. The first time you complete a paper under exam conditions will be hard, but that is the point, the next time you try a past paper it will get easier.

When you have finished go through the paper with a different coloured pen and correct your mistakes and fill in any questions that you missed out.

You are meant to study at least 4 hours extra per subject each week. Most papers take two hours to complete, and it will take another hour to go through and add in what you missed or correct what you got wrong. This means that you could take a huge step towards the minimum learning you need to do each week just by completing and marking/correcting a past paper.

Techniques to be wary of

Perhaps the best way to judge any technique is to examine how easy it looks. If a suggested technique is easy and requires little effort, unfortunately, it is probably not going to be that effective.

Questionable technique 1. Visual, Auditory and Kinesthetic (VAK) learning.

In VAK, the student completes a questionnaire to see which type of learning they prefer: visual, auditory and kinesthetic. However, in several large scientific reviews, VAK has been shown to have no impact on improving learning and there have been some suggestions that it is damaging.

When you focus on only one type of learning your brain fails to make connections to other types of memory and you fail to make long lasting memories. In neuroscience the evidence is quite clear that a student should try to include as many different types of learning/memory as possible for each piece of information that they are trying to learn.

Questionable technique 2. Highlighting

This is useful if you are highlighting key words or essential information. The problem is that highlighting uses a very low level of processing and leads to virtually no learning. The purpose of highlighting is to draw your attention to important information in the future. It is *preparation* for learning and does not count as part of learning itself.

Questionable technique 3. Post-it Notes

Putting up post-it notes around your house is a very weak version of the Method of Loci that misunderstands how the technique works. You can use post-it notes to help when you are creating a Method of Loci in your house, but it won't work if you are not going to include all the creating a story and practicing with your eyes closed.