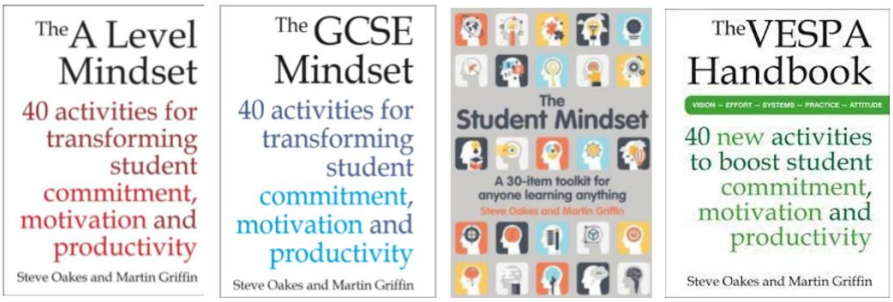

Effective, Evidence-Based Revision

Seven tricks to keep you on top of your studies, reduce stress, and improve your grades

25 Minute Sprints

There's a very famous book by Italian entrepreneur and author Francesco Cirillo called The Pomodoro Technique. Pomodoro is Italian for tomato. (The tomato in question is one of those novelty kitchen timers, not a real one…) We'll come back to the tomato in a bit. In his book, Cirillo argues that we can generate lots of energy and effort by working in short bursts, even on long tasks that we don't feel motivated to do. Think of all the tasks you've got to do that you just can't bear to begin. There might be revision notes, essays to write, jumbled notes to file or a coursework piece to start.

Choose one that's become a bit of a nightmare for you – that's hanging over your head and that you just don't want to do. Make a note of it here:

Step One:

Now for the tomato. By which we mean getting hold of either (a) a kitchen timer. Needless to say, it doesn't need to be shaped like anything in particular! Or (b) the timer on your phone.

- Find somewhere quiet. Arrange the things you need to begin. You're going to do a 25 minute sprint. It's important to tell yourself this: *twenty five minutes. That's all.* You're allowed no distractions whatsoever in that 25 minutes. Don't worry. You can be back on social in twenty five minutes, checking updates and messages.
- Now start the timer and go!

Step Two:

Congratulations! You've got that nightmare task started. All of a sudden, this job is going to seem less frightening. You'll be able to come back to it.

Some suggestions for messing around with the Pomodoro Technique:

(i) Try 25 minutes on, 25 minutes off, 25 minutes on. It takes 1 hour and 15 minutes in total, and you can do it at a regular time each night after school.

(ii) Try 25 minutes on, 5 minutes off, 25 minutes on, 5 minutes off, 25 minutes on. It takes about 1hr and 30 minutes, and is a useful technique for really attacking a difficult piece of work.

(iii) Try measuring tasks in sprints. How many will it take? This way, you'll develop a sense of how you work, and you can begin picking off scary tasks more quickly and easily.

(iv) Try using sprints to review work. Suddenly you'll find yourself ahead. On top of things. It's a great feeling!

Pre-Made Decisions
aka If/Then Planning

Life is full of decisions. Each day we make thousands; estimates range between 3,000 for young children to something like 35,000 for adults.

And we all experience something called decision fatigue – a decrease in the quality of our decisions over a long period of decision-making. (That's why those decisions we make at 10pm after a full day at school/college might not be our best.) It's partly because we often spend a lot of our decision-making energy throughout the day on small decisions – whether to buy this chocolate or that chocolate, what to eat for lunch and where to sit, how to spend a small amount of money, which bus to catch home.

Often our small decisions have taken up a lot of mental energy, leaving our important, behavioural decisions as unplanned reactions.

This activity allows you to anticipate some of those decisions, and to 'pre-make' them.

Use the decision-making energy you've got now to plan out responses to future events, and make decisions now that represent the best possible future you. Some of them happen to everybody, and we've included them below. Others might be specific to your situation, so there's blank space lower down for you to add scenarios:

Scenario: IF	**Pre-made Decision: THEN**
You plan on doing some important research, but your internet connection is down.	
You set aside some time to catch up some crucial work, but a friend arrives and wants to hang out and chat.	
It's one week until an important test, and you know you've got a significant amount of revision to do. But your employer ask you to do an extra shift.	
You're planning on working, but a friend tries to persuade you not to.	
You have important tasks you want to get finished but there is something great on TV/social/the internet.	

A fellow student asks you to cheat on a test.	
A friend asks you to skip a class with them.	
A close friend suggests grades aren't that important – that revision is boring and college is worthless. They ask you to join them in quitting study and deliberately failing all exams.	

Chances are, *these things will happen*.

So it's good to have already imagined them, mentally rehearsed them, and clarified what the best version of you will do when these situations come along.

You might not always make decisions that fill you with pride, but pre-making good decisions does make them more likely to happen!

Environment Design

The places we choose to work often have a big impact on how effective our work is.

Our environments can influence the quality of our concentration and focus in both positive and negative ways. An interesting study by two researchers at Reading University, Derek Clements-Croome and Li Baizhan, found that UK office workers felt significantly less productive as their work environment became more crowded or cramped, as temperatures varied or quality of light diminished. A large majority of the subjects interviewed estimated they might get a 10% rise in productivity if their environment was better.

We've seen similar effects with thousands of pupils over twenty years of teaching. And surprisingly, we've seen students who deliberately sit down to work in noisy, distracting locations so that they can be disturbed. When we meet to talk about their lack of progress, they'll often tell us, "Well, I tried to work, but I couldn't concentrate," or "I like working with lots of people around me." Inevitably when we check the quality of their work, they've expended lots of time but in fact got very little done.

What are your work environments like, and what link might they have to your levels of focus, concentration and flow? By figuring out where you work best, you can increase your levels of concentration, and get more quality work done in less time.

School/College Spaces

Try walking your school or college environment and mapping where your high concentration, high flow spaces might be. Visit study rooms, workspaces, your library, and so on. Look out for:

- the levels of foreground and background noise in these rooms,
- the number of other people there,
- the behaviours of the other people there,
- the quality of the seating spaces (like the tables, chairs and desks)
- the levels of light.

More than anything, try and capture a feeling – is this place calm and focused? If it is, you will be too.

Home spaces

Now have a look at the space you have at home. It might be a shared space, or a space you have to yourself. Try and examine it with fresh eyes. What is your desk like? The space around you? Do a check of your home space too. Have you got a corner of your room which is a calm, quiet, high flow space?

If not, you need to make one.

Digital Spaces

Finally, have a critical look at your phone screen. What messages and temptations is it placing before you every time it lights up? Consider taking a closer look at:

- Your usage report, breaking down your phone use app by app
- Apps that are highly distracting
- Apps that are habit-forming; that you use almost without thinking
- Those apps that bombard you with on-screen alerts or nudges
- Those that work positively, that you could use as a reward

A few hours re-designing your physical and digital environments could reap huge rewards in the coming weeks, so this audit is well worth doing.

High and Low Utility

	Technique	Always use	Sometimes use	Never use
High Utility	Practice tests – moving in and out of exam conditions, practising what is required in the time you're given.			
	Spaced practice – scheduling practice tests and revision sessions out over time; snacking instead of bingeing.			
	Elaborative interrogation – explaining complex concepts and ideas to others – teaching someone else the material.			
	Self-explanation – writing out explanations; explaining how new information is linked to old information. Clarifying connections between information.			
Moderate Utility	Interleaved practice – designing study that moves you from topic to topic, task to task and subject to subject rather than blocking out long sessions of the same activity.			
	Summarising – writing out/recording summaries of the information that is to be learnt.			
	Highlighting – reading material with a highlighter and selecting the key information as you go.			
	Mnemonics – creating phrases, memorable words, visualisations or lists to recollect material.			
	Text into Image – attempting to turn information into images so as to better recall it.			
Low Utility	Re-reading – setting out all your notes and course textbook and reading them through again.			

Professor of Psychology John Dunlosky (Kent State University, 2013) has closely examined a wide range of practice techniques, then seen what impact they have on student performance. Those techniques that seem to have only a weak connection with getting a good grade, he calles ‘low utility’ techniques. These are necessary at times, but only have a small impact on success. Others he classifies as ‘moderate’ or ‘high’ utility.

The latter are the technqies that seem to have a very strong association with good exam performance and good grades.

His findings are above – we’ve adjusted his language to make it more accessible.

- Which ones are you routinely doing a lot of?
- Which ones do you try ‘rarely’ or ‘never’?
- Choose one technique that is moderate or high utility and try and break it down into steps. What things might you have to do in what order to use the technique effectively?

Cog P versus Cog A

A fascinating study experiment took place at the University of Georgia, led by a professor of Biology, Kathrin Stanger-Hall. Here's what happened. Students were split into two groups. They were going to be taught exactly the same material by the same teacher using the same resources – but here was the one difference; the first group knew they were going to be tested at the end by a 90-question multiple-choice exam, and the second group knew they'd take the same multiple-choice exam followed by a more challenging series of short-answer questions. Off they went to revise for their exam. The researchers watched them closely. It turned out there was no difference in the amount of time they spent studying. However, there was a difference in how they approached their revision.

Those who knew all they had to do was to prepare for a multiple-choice exam became passive (we're going to call this group **Cog P: cognitively passive**). They tended towards five revision strategies that were comfortable, repetitive and less challenging. Here they are:

1. Reading the assigned text
2. Re-reading class notes
3. Making flash-cards of notes
4. Highlighting key terms during reading
5. Looking up difficult information

Those who knew they also faced short-answer questions were active; testing themselves more regularly and pushing themselves to do harder revision sessions (we're going to call this group **Cog A: cognitively active**). Here are five of the activities they used:

1. Repeatedly asking/explaining "how does it work?" and "why does it work this way?"
2. Creating and answering challenging study questions
3. Closing notes and testing how much is remembered
4. Drawing and labelling diagrams from memory
5. Setting tests, trying to answer questions, then looking up information

Before we show you what happened to their results, think about the differences between these approaches, and make some observations or suggestions about the impact they may have had:

The researchers just looked at the responses to the 90 multiple-choice questions, because both groups answered these.

So what did they find? Here we go:

Cog A students "…scored significantly higher on these 90 questions."

Cog A students "…scored significantly higher on the higher-level questions."

Cog A students "…learned significantly more, including critical-thinking skills."

Of the Cog A students "…72.1% agreed or strongly agreed that they saw the value of learning."

Of the Cog P students "…57.3% of students agreed or strongly agreed that they saw the value of learning."

What does this teach us?

Cognitively active revision gets you better results, **even if you spend the same amount of time doing it.** This means you might not have to do more revision to be successful… you might just have to do different revision. That's great news for your work-life balance!

Plan a revision session that incorporates a cognitively active revision technique in the space below:

Closed Book Notetaking

Two psychologists working in Indiana in the US[1] studied four revision techniques and their impact on test performance. 80 volunteer students were split into four groups before the test:

1. **Single-reading study**. In this group, students had to read a chapter once.
2. **Repeat-reading study**. In this group, students had to read a chapter four times.
3. **Mind-mapping**. In this group, students read the text once, summarising it in a mind-map.
4. **Active recall**. In this group, students read the text once, then covered it up and tested their recall by writing out as much of it as they could remember in two practice tests.

Before they began the experiment the students taking part were asked to predict which group would perform best on the test.

- What do you think the students predicted would be the most effective technique?
- You know that activities like these have surprise punchlines, so you're probably guessing the students were wrong. And they were. So in the light of that – what's *your* guess as to the technique that was most efficient?

Let's take this a step further. There were two types of question asked in the test, mixed up so the students didn't know what to expect.

1. Question type 1 were 'recall questions.' Students had to answer simple questions about the information that had appeared in the text.
2. Question type 2 were 'inference questions.' These questions were harder, asking students to connect ideas and concepts, requiring deeper knowledge.

Now guess which techniques yielded which results! For the simpler recall questions:

	Which technique?
Winners: 65% of questions correct	
Runners Up: 45% of questions correct	
Third place: 40% of questions correct	
Last place: 27% of questions correct.	

For the more complex inference questions:

	Which technique?
Winners: 70% of questions correct	
Runners Up: 57% of questions correct	
Third place: 55% of questions correct	
Last place: 28% of questions correct.	

Jeffrey D. Karpicke, Janell R. Blunt, Department of Psychological Sciences, Purdue University, West Lafayette, IN 47907, USA. Journal *Science* 11 Feb 2011:

The same technique won both times: *active recall*. It was the technique that the students thought would work least-best of the four, but in fact it worked the best of the four! It just goes to show that our instincts about revision are often wrong.

Testing yourself will lead to better performance than re-reading notes *four times*. Think of the time you could save.

So active recall is definitely a technique you should add to your studies. A great way of adding active recall to your studies is to try Closed-Book Notetaking. Here's how to do it:

Closed-book Notetaking: an active recall study technique in five steps

First, you'll need to chose something you want to learn. You'll need a section of textbook – not too long – or a study guide or some notes you've already made. Once you've chosen what you're aiming to learn, here's what to do:

1. Read the section of textbook/information *without taking notes*. Really connect and concentrate as you read and highlight.
2. Now close the book/put the notes away.
3. Now write notes on the section you've just covered without looking at the information! It will feel hard. You might get frustrated. You won't be able to remember everything. No problem; leave lots of space to add forgotten information. Scatter the notes around the page with subheadings and leave lots of white paper.
4. When you're done, open the book or turn over the notes. Re-read once, then close the book again. Now note-take for a second time but…
5. …add the stuff you missed or forgot in another colour, filling the white space you left first time around.

And that's it. This approach will be more effective than reading the material four times. You might even finish more quickly than you would have doing four re-reads.

Of course, it will feel harder than just re-reading. It's not as comfortable, and you might feel exhausted by the end. But you'll perform better in tests and exams if you make this part of your weekly study!

Verbal Recaps (aka Teach Your Imaginary Class)

This tool is a habit-changer which will very quickly boost your understanding. Of all the activities here, it's the one that takes only a little effort but can yield big results – so it's well worth a try next time you have something you need to read through.

Here's what you do. Every time you read a page of a textbook or study guide, stop and then:

1. Close the book.
2. Calm your mind for a second and think – *what did I just read?*
3. Now talk aloud, summarising in your own words exactly what you've just been reading. Choose one of these starters to get you going if it helps:

    - "The writer has just been explaining that…"
    - "This section explores…"
    - "The important idea here is that…"
    - "This page outlines the importance of…"
    - "The writer's argument here is that…"
    - "I've been reading about how…"
    - "I've learnt that…"

4. If you can't summarise it clearly…there's been a problem. Not to worry. Go back and read the section again, and repeat step 3.

5. Once you're happy you can summarise the content, try asking and answering more complex questions; not 'what', but 'why' or 'how'. Try these:

    "*Why is this section important?* Because…"
    "*Why has it been included?* Well, it's crucial because…"
    "*Why is this bit detailed… or why isn't it detailed?* I guess it's because…"
    "*Why is the information in this order?* The writer covers this first/second/third because…"
    "*How does it relate to the previous section?* It's linked in the following way…"

Reading like this means you go slower. But it means you're testing yourself as you go along.

<u>Two extensions to try…</u>

1. Try adding **spoken summaries of whole chapters**, verbally once you've read them, like this:

"First, the writers explore…."

"…then they go on to argue that…."

"….then they look at -------- in more detail, explain how…."

"And they finish by concluding that…."

You'll find that the information you read goes in. It sticks, and it's easier to recall. Your reading might have taken a little longer, but you've been able to fully explain what it is you've just read.

2. Try putting together **a short lecture as if to an imaginary class**.

We often suggest this script if you want to have a go at this one. It looks pretty straightforward, but you'll quickly find you really need to know your topic in order to start your mini-lecture like this.

It's a good one to do in a study group – each member takes responsibility for one topic, and presents it using the script below:

This afternoon I'm going to be talking you through…

This part of the course is crucial because…

The key definitions you'll need to be able to handle are…

The big ideas that you'll need to be confident about are…

The exam is going to ask you to _____, so pay particular attention to _____

Right, we're ready to get started. A good place to begin this lecture is by looking at _____