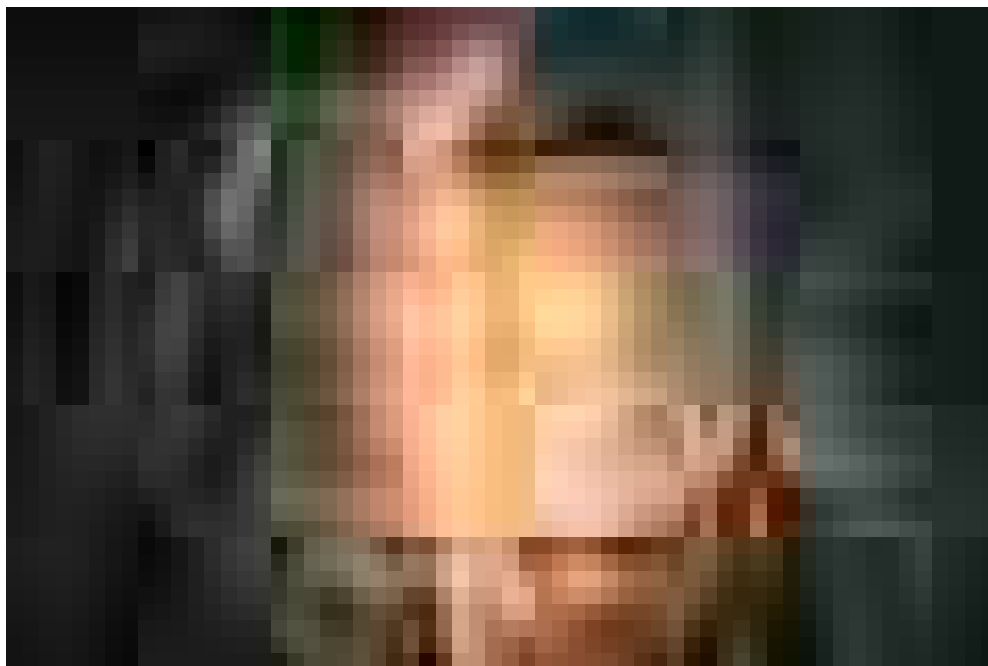


The Complete Guide to Effective Reading



[Let's make that magic happen](#)

Apr 27, 2019·30 min read

Learning is a heavily misunderstood concept.

As a paradigm example of deep work, we understand that, when reading, directing your full attention to the material at hand is essential. Grasping complex information is hard.

But this is only half the battle.

After some string of words hits your retina and has made its way to your brain, you're not done.

In a cruel irony, these hours of deep work often cause flow states and the feeling that 'you've had a good day' and learned a shitload of new stuff.

But for many reading episodes this feeling is deceptive. There is an ineliminable aspect of learning that takes place *after* the glorious flow state.

The other half of the battle is to transfer the newly acquired intelligence from your working memory to your long-term understanding and integrate it into your standing stack of mental models.

If you don't facilitate this, your learning gains are only a fraction of what they could have been.

In this article, I'm going to breakdown how to win the battle and the war — how to avoid these traps and organize your reading habit for a maximal Return On Investment (ROI) on reading hours.

This is what we'll cover:

Table of Contents

Warning: this is a very nerdy post.

Meta-Learning

Meta-learning is knowing how to learn. It is one of the most important skills to learn, yet few people know how to do to it.

Reading and writing is what I do for a living, and, interestingly, a lot of non-imaginary friends have been asking me how I learn. This is special, because most of the times when people don't know how to do something, they go to great lengths *not* to notice their deficiency.

Could it be that many students turned 'knowledge workers' have the nagging feeling that something is missing in their skillset because they were never taught meta-learning?

This is not their fault, but a [lack in our education system](#).

As Adam Robinson observed on the [Farnam Street podcast](#):

"No one ever shows us how to learn, ever. Nowhere in school. For example, imagine, Shane, [Shane is the host of the FS podcast] in French class, French 101, your first French class, your teacher said, "Everyone, you're going to have to learn a lot of vocabulary in this

class so before I teach you any words I'm going to teach you a way to remember vocabulary." They never do that. They just go, "We're going to have a quiz on these 30 words on Monday. Good luck." But they don't teach us how to learn actually, or remember things."

This is weird, because, in today's high-information world, people need the ability to *make sense of* complexity and to *combine* many bits of data into a broad picture of the world.

Merely *acquiring* information is *not* (yet) learning.

Learning itself is a skill, and knowing how to do it well is an incredibly valuable advantage.

We take this is for granted, but how to do this is far from obvious and doesn't get taught in the curriculum.

Learning is a two-step process

So, how do we learn?

Before we attempt to answer the question, let's get clear on what a satisfactory answer needs to get us. What does it *mean* to learn? When have you learned something?

In the introduction, I stated that just studying the information isn't enough (no matter how intense your focus was). Learning has two phases — not one.

1. Read/listen the damn thing
2. Process and recall what you've just 'learned'

A lot has been said about the first phase — about deep work, concentration, blocking out distractions, and so forth. This makes sense: if you're checking Facebook all the time, your mind is not 'there', and you might as well not have spent your afternoon 'reading' this book.

This is all great and I'm a big fan, but in the meantime, we're ignoring step two.

If you don't spend time revisiting and grappling with the book either, *the same applies* — you might as well not have read it. In the long run, there is no difference between skipping the first or the second stage (except whether you passed that French test in high school back in 2019...).

After you've killed Cersei, you've still got the White Walkers to deal with. If you don't, you lose either way.

That is why students who binge-study the night before the exam quite literally forget everything two days later: while all these lame French words were still in their short-term memory, allowing them to pass the test, the information never transitioned to their long-term understanding — and so, sooner or later, it evaporated.

To learn, you need to transfer the newly acquired intelligence from your working memory to your long-term understanding.

The jump from short-term memory to long-term understanding doesn't happen automatically. The default mode, after you close your books for the day, is not retainment but *forgetting*.

This learning guide is not about [how to do generic deep work](#). It explains how to maximize the ROI on hours spent reading, *assuming* you did them 'deep work style'.

Remembering the right things

First, I need to discuss a common objection that denies phase two of learning matters. If you have no quibble with memorization, and doing the required effort, you can skip this section.

"But Mr. Maarten," the protest goes, "you mention 'processing' and 'remembering' into my 'long-term understanding', but isn't memorizing pointless? My Google Assistant can look everything up and also is smarter than me, says my Google Assistant."

Indeed, Albert Einstein is [supposed](#) to have said: "Never memorize what you can look up in a book". In Einstein's days, books were unequaled as a source of information. We, on the other hand, live in

an age where nearly everything can be accessed through the magic vehicle of internet. Following Einstein's logic, then, *nothing* is worth memorizing anymore, because *everything* can be looked up.

But, of course, that is probably not what old Albert was getting at.

Most likely, the advice he wanted to dispense was that you should not waste your time by committing unimportant details to memory. Rather, your focus should be on understanding the bigger picture — on how things relate to each other.

This reminds me of Elon Musk's approach to learning. He [recommends](#) viewing knowledge as a tree:

Make sure you understand the fundamental principles, the trunk and big branches, before you get into the leaves/details or there is nothing for them to hang on to.

To 'learn', we need to do more than merely feeding ourselves new information. Expanding our intelligence requires *connecting* new materials to what we already knew (the second phase of learning). That, in turn, requires something to connect *to*.

There's no adding branches without a solid trunk.

The very possibility of genuine insight requires a memorized base. Without it, data you consume will not be added to your tree of knowledge. Instead, they will float in the air for a couple of weeks or so, before being taken away by the wind.

Knowledge, gone. Time, wasted.

What I'm saying is *not* that we should devise techniques which enable us to recite everything we've learned. That's why we're not talking about, for example, retaining the date of the French revolution.

However, you *should* learn by heart the lessons it tells you about how the world works and update your representation of reality accordingly.

In other words, you should use it to inform your unconscious — the sum of your mental models.

Enter: Mental models

I've long been skeptical about mental models since (1) they're all the rage now and (2) no one seems to be able to explain in concrete terms what they are. A dangerous combination.

It turned out my doubt was due to ignorance on my part.

A mental model, as [Wikipedia](#) tells us, is

An explanation of someone's thought process about how something works in the real world. **It is a representation of the surrounding world**, the relationships between its various parts and a person's intuitive perception about his or her own acts and their consequences.

Every problem and situation is just another 'one of those' — another one of a certain type. Figuring out what type it is and reflecting on principles for handling that type of issue will help you do a better job.

On the conscious level, mental models allow us to 'fit' different possible interpretations onto reality to see if it is 'one of those'.

For example, according to [Hanlon's Razor](#) one should "never attribute to malice that which is adequately explained by carelessness". When your coworker hands you crappy slides for the presentation you have to give in five minutes — what's going on here?

Which 'one of those' do we have here?

You can see how different mental models in our heads will cause us to reach different conclusions about the correct interpretation of the situation.

A mental model is a mental, simplified depiction of how something works. They are how we order complexity, why we consider some things more relevant than others, and how we reason. They help us filter, organize and understand.

For instance, according to [Pareto distribution](#), "for many events, roughly 80% of the effects come from 20% of the causes". When

reviewing your client database, should you assume your income is distributed equally over paying customers (and only remove the non-paying ones), or should you assume that 20% of your customers bring in 80% of your cashflow, and *also* remove the paying customers from the bottom 20?

Which 'one of those' is this?

You can see how different mental models in our head will cause us to reach different conclusions about which course of action should be taken.

On an unconscious level, you can think of mental models as psychological lenses that color and shape what we see. They not only tune what we think and how we understand, but also guide which connections and opportunities we see in the first place.

In [Me, Myself, and Us](#) Harvard personality psychologist provides an illustration of this I find very intuitive:

The more limited one's repertoire of personal constructs, the greater the anxiety and the fewer the degrees of freedom one has in anticipating and acting upon events in your daily life. This helps explain why your sister can't seem to move beyond her divorce, in spite of all your attempts to give her new things to do. She treats everyone in terms of a simple construct, 'trustworthy vs. will leave me in a flash like Sam did' and in so doing she reduces her degrees of freedom and retreats from re-engaging with life and moving ahead.

Learning = upgrading your mental models

We've now seen three ways the mental models we shape in our head influence our perception, decisions, and behavior. What about learning?

As [Ryan Holiday](#) has [pointed out](#), when the number of connections you're aware of increases, the ROI of reading grows exponentially. After we've built a web of mental models, more insights are within

reach, after which our web is bigger, after which the relative distance to new learnings decreases further, and so forth.

But what isn't there, can't grow. So memorize them.

The more models you have — the bigger your toolbox — the more likely you are to have [the right models to see reality](#). If a possible interpretation is not in our toolkit, we can't use it to understand what's going on. Indeed, those with few [personal constructs and narratives](#) have limited sense-making abilities. Their tools just don't apply to many of the new situations they need to deal with in life.

So: you've got to have multiple models. If you just have one or two that you're using, the nature of human psychology is such that you'll torture reality so that it fits your models, or at least you'll think it does.

The truth, however, in the contra-memorization argument is that knowledge has a half-life. Over time, one group of facts replaces another. Information and what you've learned loses its value as new information is generated.

Therefore, the most useful knowledge is education of how reality works at the fundamental level.

Fill your head with a big trunk and solid branches, not with leaves. Remember the mental models.

This helps because it increases your level in what scientists call "[integrative complexity](#)": the skill to integrate multiple sources and perspectives into a bigger, more coherent picture.

The quality of our thinking is proportional to the models in our head and their usefulness in the situation at hand.

And *that* ability is true, future-proof, intelligence.

How to 'get it in there' (macro-level)

So far, we've seen that [a] learning requires (1) deep focus and (2) ensuring that the newly acquired material makes the jump to long-

term memory. This [b] only happens if there's 'something there'. So [c] whoever said having mental models 'in your head' is pointless probably didn't know very much. Finally, [d] the more frames that we have at our disposal for making sense of the world, the better.

The next-most-obvious question is:

What does it take to harvest these sweat-overflown study hours, and increase my long-term understanding and integrative-complexity skill?

It requires that (1) you facilitate the leap from short-term memory to long-term understanding. Because this kind of long-term memory equals your repertoire of mental models, this, in effect, means you should (2) use it to build your latticework of mental models.

The most famous proponent of the concept is Warren Buffett's business partner, Charlie Munger. He summed up the approach to wisdom through mental models by [saying](#):

"Well, the first rule is that you can't really know anything if you just remember isolated facts and try and bang 'em back. If the facts don't hang together on a latticework of theory, you don't have them in a usable form. You've got to have models in your head. And you've got to array your experience both vicarious and direct on this latticework of models. You may have noticed students who just try to remember and pound back what is remembered. Well, they fail in school and in life."

You've got to hang experience on a latticework of models in your head. This knowledge becomes your foundation. Your trunk. So when you read and connect things to this core, not only do you have a better idea of how things fit together, but you also strengthen those connections in your head.

OK, and how do we do *that*?

How to 'get it in there' (micro level)

“When we read, another person thinks for us: we merely repeat his mental process.” — Arthur Schopenhauer

Now, the rest of this essay will cover the question burning on your mind:

How do I facilitate the jump from short-term memory to long-term understanding?

For something to become a part of your assembly of mental models you need to *process* it. That happens through *engagement* and *repetition*.

Repetition works best with a system. We'll get into how to build one later.

First, a word on engagement. For that, you need to become an active reader.

From now on, no more passive reading. Ever.

If there is one thing you take away from this guide, let it be that.

Active reading is reading with the conscious intention to understand, integrate and evaluate the information you're reading.

Compared to more 'passive' reading, where you just take the words in, actively engaging with a book is more hands-on, deliberate, and slower. But the payoff is immense.

Know your why

There are different ways to use active reading to maximize the ROI on reading, depending on why you're reading.

Mostly, I read books and academic papers. I use different methods for these different materials, because the density of information is so vastly different.

Papers are usually around 20 pages and take me four hours. I don't measure my reading speed when it comes to books — it sucks the joy

out of it, I've found — but I suspect it's much higher.

Difference number two is in the 'what for' question. I read books for fun — out of curiosity and a desire to increase my understanding of a particular subject. The focus is on [being present](#).

As [Naval Ravikant](#) points out on the [Farnam Street podcast](#), most books have the one point to make and it's fine to fast-forward and skip and skim and do all these other sinful things.

I read papers, by contrast, because I plan to discuss them in my dissertation. That requires me to go into the nitty-gritty. The focus is on the *hard* note-taking.

So ask yourself: what am I reading this *for*, and how deep do I want to go?

I've outlined the rest of this guide in three parts:

- Engagement (1): For materials that are more about the broader picture or fun, I use mindmapping. If your goal is to study the concepts for fun, get the gist of and update your map of this area, then that's what we're gonna do — draw a map.
- Engagement (2): However, if it's more of a 4-hours-for-20-pages kind of thing, we're going to take a more linear approach. For the most complex material with a high density of information that is new and/or hard *to me*, I use Cal Newport's QEC method.
- Repetition: To drive your victory in the second half of the battle home, you need to design a system for periodical review.

Active reading

"The words of the writer act as a catalyst in the mind of the reader, inspiring new insights, associations, and perceptions, sometimes even epiphanies. And the very existence of the attentive, critical reader provides the spur for the writer's work." — Nicholas Carr

Let's say you're reading a book on fundamental physics for fun (as I did during the Christmas break). Still, you want to make sure the information you absorb ascends into your toolkit of mental models. In that case, you can't get away without *some* form of note-taking. As [Danny Forest](#) eloquently [observes](#), devouring non-fiction books without taking notes is an "unproductive skill".

What's the point of reading a book to learn something and immediately forget its lessons? Surprisingly, many people are good at this. — [41 Skills to Forget Unless You Want to Completely Waste Your Time This Year](#)

Remember: the jump to long-term memory requires (a) processing and (b) repetition. What's the best way to incorporate that into the reading process, without the note-taking transforming our entertainment into a laborious task?

What's the 80/20?

Enter: mindmapping.

Mind mapping is a visual technique for summarizing the material that is specifically designed for the purpose of building a mental picture and seeing new connections. It's perfect for understanding the broad picture and updating your mental representation of your reality — because a mindmap *is* a visual representation of reality!

The reason they work so well is that they get both parts of your brain involved. When you read a "normal" summary, you mainly use your left hemisphere, which processes language. By using colors, images, symbols and arrows, in mindmapping, you also use your right hemisphere. By using both halves of the brain together, you can process and understand information faster and remember it better. In addition, the spatial planning in the mind map makes it easier to distinguish between the main and side issues of the material, it saves you time because you only write down keywords and it is especially nice to work with the material in this way.

How to make a mind map

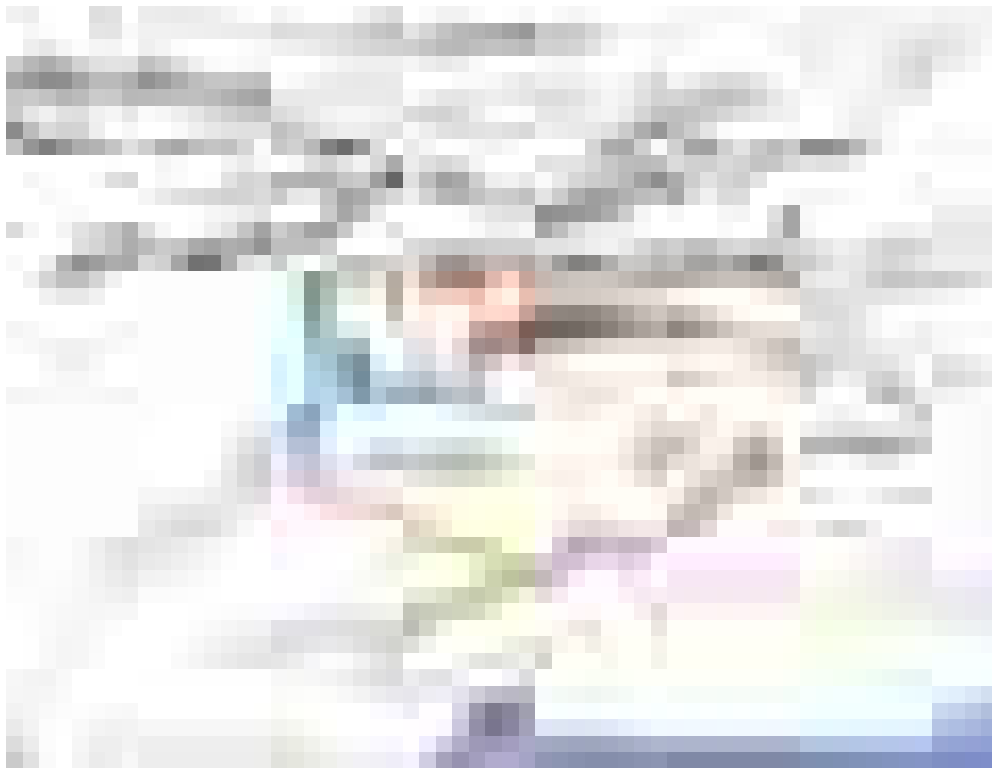


This is how it SHOULD look ([©iMindMap](#))

Start with the subject of your mind map. The subject is the central idea and is similar to the title of a book or chapter. Place it in the middle of an empty sheet of paper. Then add the following things:

- Main- and subbranches. The main branches connect directly to the central idea and contain the main themes of a mind map. Sub-branches contain more detailed information. You have limited space, so think about your learning goal when deciding to draw a branch.
- Keywords instead of sentences. In Mindmappia, using sentences is considered treason. Only keywords are allowed. This is an important difference with traditional notes, which often use entire sentences. A keyword is a specially chosen word that serves as a unique reference point for what you want to remember. It becomes even more powerful when it is accompanied by key images. This activates both hemispheres of the brain are stimulated, making it easier to remember the information.
- Colors. Each main branch and the sub-branches that hang from it are drawn in one color. This provides a visual distinction between the themes.
- Symbols. You can add a symbol to clarify a keyword or you can place the symbol on your own branch. Frequently used symbols are, for example, +/- (advantages / disadvantages) and ↑ / ↓ (increases / decreases).

- Pictures. A picture paints a thousand words. When you come across an important passage or concept, pause and visualize it. Make the picture as salient and distinctive as possible. Building vivid mental pictures is one of the most effective techniques for remembering anything. You can generally display processes with images, for instance.
- Arrows. Often, related information will be represented at different locations on the map. You can connect it with the help of arrows. This provides new insights and visually shows which topics are related to each other.



I don't always follow all the rules super strictly

(I've spent some hours researching free digital mindmapping tools and found [ViewYourMind](#) to be superior, but prefer analog cause it seems to be more effective and is more fun.)

Which Returns are you aiming for?

A mindmap can only be one page, so it forces you to structure the information. To be able to impose structure on the material, you need to (again) be clear on why you are reading this book. For entertainment? To understand something or someone you don't

know? To get better at your job? To improve your health? To learn a skill? To help build a business?

Your answer will change which parts are relevant and which aren't, so think about this.

Again, you don't just want to collect information. That will never stick.

Written active recall with bullet points

Mind-mapping is great for getting the core concepts of the book and 'seeing' how they relate to each other. But sometimes, you want a bit more depth. Something we jotted down and can refer to, perhaps akin to a summary. At the same time, we don't want to turn it into a note-taking monster.

What can we do?

For this, [Shane Parrish](#) from *Farnam Street* [came up](#) with a trick:

At the end of each chapter, *without looking back*, write some notes on the main points/arguments/take-aways. Then look back through the chapter and write down anything you missed.

After you've completed a chapter, write *bullet points* on what you want to take away from it.

I like this because it will give you a concise list of bullet points per chapter, without interrupting the flow of reading and without you having to write stuff you don't care about just for the summary to be complete.

Plato at the Googleplex

Intro

1. A secular approach to the question of human meaning is an important condition for the coming to existence of philosophy
2. The ancients did not have the concept of 'individual rights'
3. Many cultures, including the Ancients, subscribe to the Ethos of Extraordinary according to which meaning requires exception
4. Plato thought that the kind of exception required for a life worth living is philosophy, or the cultivation of reason ("The unexamined life is not worth living")
5. Philosophical progress is invisible because it is incorporated into our points of view

H1

1. Mathematical existence is like seeing a movie exists in chess
2. One of the peculiar features of philosophical questions is how eager people are to offer solutions that miss the point of the questions
3. Scientific methodology is the arrangement that allows reality to answer us back
4. David Hume's argument concerning the "principle of the uniformity of nature" comes down to an argument that, since science presumes the lawfulness of nature, science cannot non-circularly provide evidence for this. I mean intuition that there is an intelligible regularity underlying nature
5. If philosophy makes progress, then why doesn't Plato at long last go away? Answer: Progress in philosophy often consists of bringing to light the covert assumptions that have governed their way deep into our thinking
7. For Plato, inner drama is the essence of philosophy doing its work. The experience of the disquiet of our certainties compelling for a truth
8. If philosophy is an irregular form of thought and its conclusions do not have their own impact is questionable. Plato had this fear too: truth can't be transmitted from our mind to another, but comes from the violent activity of philosophy, a drama enacted in each of us. The dialogues are meant to instigate the strenuous activity of clearing new points so that what is personal or cultural can be explicated

H2

1. If we don't understand our tools, then there's the danger that we become the tools of our tools
2. We have to educate rulers so that they don't fall in love with their own Power

My numbered bullet points from the beginning of '[Plato at the Googleplex](#)'

How to actively read a book

So, what does the overall, diachronic process look like?

1. First, be clear on what you are reading a book **for**. You have to have some idea of what you want to get from the book. This will play a vital role in structuring the information the way that most congenial to *your* personalized learning goals.
2. Then, **before you start reading a new book, review your mindmaps and/or notes of related topics**. If you've tagged appropriately (see below), and made your mindmaps true 'maps of your mind' this

- should be intuitive and needn't take a lot of time. If you want to go the extra mile, take a look at [Shane Parrish's 'Blank Sheet'](#) method.
3. Based on your learning goals and the book, **determine what the central concept will be and put it at the middle of an empty sheet of paper.**
 4. Keeping in mind the rules discussed above, **add to the mindmap after each session.**
 5. **After you conclude a chapter, without looking back, jot down a list of bullet points of things you wish to remember.** While you should realize this is what goes into your system, and what you don't write down here doesn't, still be selective (otherwise the exercise doesn't work).
 6. **Before you start your next reading session, review the mindmap and bullet points.**
 7. When you're done with the book, put your mindmaps and notes in a [commonplace book](#) or your preferred note-taking app (I use [Evernote](#)) and build a system around it making sure you'll review it on a regular basis. Don't worry, we'll cover this.

Remember your why (yes, again)

To repeat: the process of learning comprises reflection and feedback, or engagement and repetition. If you read something and you don't (1) build a vivid mental picture, (2) make mental links and (3) make time to think about what you've read, the ROI will be low.

Yes, this takes more mental effort — remember: no more passive reading — and more time. So a small aside on why you were doing all this in the first place.

■ Don't forget to have fun.

This is crucial because if come to detest this process it will kill your reading appetite.

Satisfying your curiosity in the best way possible and maximizing your learning shouldn't feel like a burden. If it does, reconsider your motivation or choice of topic.

Also: put the book down if you lose interest. Because this is counterintuitive for most people — many of us have it ingrained into us that we should ‘[finish what we started](#)’ and that this applies to everything, from goals we set to cakes we eat to books we read — I’m going to repeat myself. Stop when bored. It’s okay not to finish a book that doesn’t bite you.

In [Antifragile](#), [Nassim Nicholas Taleb](#) explains why this not lazy idleness, but smart effectiveness:

The trick is to be bored with a specific book, rather than with the act of reading. So **the number of the pages absorbed could grow faster than otherwise. And you find gold, so to speak, effortlessly,** just as in rational but undirected trial-and-error-based research.

Advanced active reading

“Nothing so much assists learning as writing down what we wish to remember.” — Cicero

From now on, things are getting serious.

The method I’ll discuss below is not for those who enjoy spending their days off *dabbling* in fundamental physics. This is for situations where you need extensive reference notes and/or are gunning for detailed understanding.

A warning upfront: that means we’ll be *studying*, as opposed to mere reading. So if active reading already was a bit much for you, feel free to skip this section.

To ignite the twin-engines of learning — engagement and repetition — for studying, I use a three-layered process. I take notes following the QEC method, upgrade my marginalia and put my unconscious to work.

The QEC method

Studying requires notetaking. However, don't simply transcribe or summarize the facts presented in the material. Remember, the point of active reading is that you — actively — engage with and process the information. Transcription is too passive.

One approach is to use the QEC (question/evidence/method), which I picked up in Cal Newport's [How to Become a Straight-A Student](#).

Here's Newport:

The method is simple: **Reduce the information presented to you into *questions* paired with *conclusions*. Between the two, list the evidence that justifies the connection.** In other words, the questions and the conclusions become a wrapper around the raw facts — transforming them into self-contained ideas.

QEC notes start with the question posed by the information you're consuming. For example, when you're reading the great book [Utopia for Realists](#), you might, when devouring the argument in favor of universal basic income, come across a section that discusses the cynic's false pet theory that people are creatures without intrinsic interests and would stop doing stuff if there would be no financial incentive. Then, instead of coming away with pages of notes, you're supposed to reconstruct the argument in a few lines.

Question: Why is there no good reason to think people would stop working when they would have a guaranteed basic income?

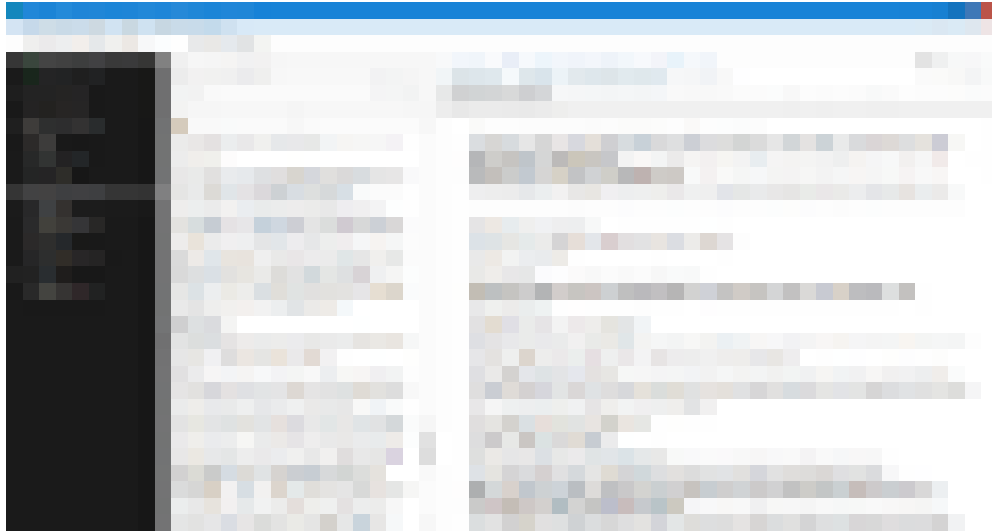
As the section continues, record the relevant facts below the question — these will form the Evidence. They'll look like bullet points

1. Experiments with a "citizens dividend" have shown that people's participation in the workforce doesn't decline when they no longer have to do it for the pay.
2. And so forth

You're not off the hook yet. As you record this evidence, begin thinking about what conclusion the data is pointing you toward. Review your evidence as it grows and make up your mind when the time is right. In our example, it might read something like:

Conclusion: There is no reason to believe that people would stop working because psychological studies show that human motivation to contribute to society doesn't diminish when they get a universal basic income regardless. Experiments with "free money" confirm this.

Or when you're writing a dissertation in [meta-ethics](#), a QEC sample might look like this:



[The Explanatory Ambitions of Moral Principles](#) (© Maarten van Doorn)

Remember, we are studying, and devising ways to maximize how *actively* we engage with the information presented to us. The QEC method promotes active reading, and hence learning, because it forces you to *process* the information as it's presented and consider what is important about what you're reading — not just copy it down.

Keep a running tally

The second layer is what I call 'upgraded marginalia'. 'Marginalia' are when you mark out thoughts, questions, and connections to other ideas' in the margins.



[Marginalia](#)

Because they increase your engagement with the material, they rock. The more you have a go at the information, and try to understand it, the better.

However, to become a part of our cataloged notes, we need to systematize our marginalia. If we don't have a system for that, they'll get forgotten — unless you want to manually check every book every now and then for marginalia. A time-consuming habit.

Here's what I do — this is writing in the margins for pros.

- Don't make your marginalia in the book, but on a separate sheet of paper.
- Use a different color of ink for this.
- Marginalia can be anything: important keywords, connections that occurred to you, objections you have to the argument, whatever seemed important you at the time.
- Then, after you're done, *work out* your loose thoughts. Just noting a possible relationship to something else, scribbling two words in the margin, is easy. Drawing the connection out is a lot harder than

you think. Marginalia don't do the heavy work when it comes to understanding. That requires you to get your hands dirty.

- This working out of all marginalia should be done *immediately after* you're done. Otherwise many of the potential connections will already have died because you didn't fertilize the eggs in time and now it's too late. Gone.
- Review it the day after and underline where you've made the magic happen — you connected the dots that were just floating around as possible nodes in your head before.

This looks something like this:



My after-reading making-the-connections scribbles from Chapter 12 of [The Domain of Reasons](#). Notice I also included marginalia from 'Intro' and 'Ch.10' (circled).

Then snap a picture and add it to your archive in the appropriate way (yes, I'll tell you how later).

The goal behind doing this is to digest what you are learning and make it your own — make associations, draw connections, play with it, hold it in your mind.

Doing this takes time and processing and writing and thinking. It takes time to make mistakes and recognize them, to make false starts and correct them, to process and evaluate complex information.

This shouldn't be a surprise. You'll do your best thinking by slowing down and concentrating. So don't be afraid to spend hours working out your marginalia. It's one of the most satisfying things to do.

For me, some thinking sessions for working out marginalia have lasted hours and resulted in pages of golden connections. These breakthrough moments have me living on a cloud for days.

Put your unconsciousness to work

The final engine we're leveraging for maximizing the ROI is a nice little hack that has given me a lot of 'free' ideas with just a five-minute time-investment per day.

As with almost anything in this guide, I didn't come up with it. This time, the source is Ralph Waldo Emerson, who advised to

“Never go to sleep without a request to your subconscious.”

The idea is to intentionally direct the workings of your subconscious mind while you're sleeping. I don't know if this exercise trades on a placebo effect or sets something more real in motion, but anyway, it works.

Every night, I take out an empty piece of paper and jot down thoughts and a follow-up question relating to what I've been trying to understand. And every morning (except on [Cheat Day](#)), the first thing I

do after waking is stumbling to my desk and to harvest the fruits of my unconscious by answering last night's question.

I often get small but compounding flashes of insight. In fact, many of my most original or 'deeper' connections occurred to me in these first five minutes after waking.

I believe that these sparks of inspiration are a direct consequence of the daily journaling, and that my unconscious wouldn't toss me so many useful thoughts without it.

Pulling it all together

This was a long part, so let me summarize.

To maximize learning ROI, we need to maximize our *engagement with* and *reflection on* the material. Reviewing and repeating will be covered in the next section. This segment focused on maximizing engagement.

We saw that your reading goal matters a lot, but that no matter what your learning goal is, as long as you have one, you should avoid passive reading.

When you're in it for a broader update of your map of the world, I recommend mindmapping. It's relatively low time-consuming, though high mental effort. That's because it forces you to actively organize and re-organize the information as you have limited spaces and may not use sentences. The draw- and color elements both provide bites of fun and engage both your hemispheres for maximal processing.

Alternatively, when you're in it for the nitty-gritty and possibly need detailed notes as reference material, I'd recommend a three-layered process. Use the QEC method while reading, upgrade your marginalia to *make* new connections instead of vaguely noting their possible presence, and put your unconscious to work for some low-effort good ideas every morning. Note that *both* the QEC and the upgraded marginalia are time-consuming and high-mental effort.

How to actively read a book (advanced)

Adding all this up, here's the complete diachronic process for reading a book QEC style.

1. After waking, answer last night's question.
2. When it's time to read, first review your upgraded marginalia from the last reading session and underline what now strikes you as key insights. Snap a picture and stick it in your system (see next section).
3. Then re-read the QEC notes. Bold the things that stand to you (optional). (This is analogous to how, on the mindmap-method, we started our reading sessions by reviewing the mindmap and bullet-point notes so far.)
4. Pull a blank sheet of paper and already list some marginalia on the right-hand side that you've read previously and you think the material in this chapter will connect to.
5. Start reading. Use the QEC method to take notes and put everything you wish to come back to in the marginalia column on your blank sheet of paper.
6. When you're done for the day, review your QECs and add to your sheet of marginalia if necessary. Then do the hard work and connect the marginalia you've written down in full, articulate sentences.
7. Before you go to bed, ask a question to your unconscious you don't understand yet.

Organizing repetition and reflection

On to the next question: how to remember all this shit and avoid the decay of your carefully built mental models?

After we've grappled with the information, true learning requires an additional ingredient of repetition or reflection.

This needn't be complex, but the truth of the matter is that many people never go back to their notes or mindmaps. We need to [self-hack](#) ourselves into doing so and design a system for it.

Organizing and using your review cycle

While there are hundreds of systems on the internet, you need to take one of them and adapt it until you have your own system. Some, like [Ryan Holiday](#), prefer to record notes [on index cards](#) or in a commonplace book; others prefer a digital system.

There are endless ways of organizing your notes — by book, by author, by topic, by the reading date. It doesn't matter which system you use as long as you will be able to find the note when you need it. So, whatever method you end up settling for, make sure there is *a* method behind it and that *you* can logically determine where the note is. Don't rely on memory for this.

Be airtight in implementing and adhering to machinery for this purpose. It might seem otherwise, but being *fully* organized in fact costs less energy than half-assing it because only when you can trust yourself and the system you've set up, the fact that you have a system saves you the mental resources of having to think about it 'Did I process that note? Where did I put it? I know I have a tag for this but it isn't there — wait let me review all the other places I might have put it.' This is no longer a timesaver.

As mentioned, I prefer to put my 'upgraded marginalia' and stream-of-consciousness journaling in the same note as the mindmaps and QEC of the original source. This makes the most sense to my brain. I guess you can also construct elaborate theme-based instead of 'source-based' notes, combining different books and marginalia and mindmaps in [one note\(book\)](#), but I prefer [tags](#) for that. Nonetheless, as many debates in the Evernote community [emphasize](#), this seems to be a matter of personal preference.

There is a very important caveat considering cataloging and reviewing.

Only do when you can apply it to a new learning project or to something you're spending your time on. Review *when you have a new* [learning question](#) — and not because you have to because a month has passed or whatever. That is boring, and you won't do it.

Therefore, I advise to only schedule time to read and review these notes if you're in a longer writing or learning process. While writing a dissertation *chapter*, I review all appropriately tagged notes every week. But if you can neither (i) apply it to a learning question or (ii) a project, reviewing is likely to have a limited ROI, (especially when your archive has become large).

As you saw, the first step of reading a new book is reviewing old notes and mindmaps. Making periodical review an actual habit is the most important thing and this does the trick.

Improved learning: engage in active recall

For improved learning, *don't* just go over your notes over and over. Rereading silently to yourself costs an incredible amount of time but produces only mediocre results.

The single best strategy for organizing constant growth, I've found, is by involving fellow human beings. To test your understanding of something — anything — [explain](#) it to someone.

You'll have to remove jargon, describe why this information has meaning, and walk them through yours or the author's logic. It sounds simple. It's damn hard and constitutes the litmus test of your comprehension.

What you can't explain to others, you don't understand yourself.

Many people, even those who are supposed to be 'smart', use complicated vocabulary and jargon to mask shortcomings in their knowledge.

One method you can use is the so-called [Feynman Technique](#). It has four steps:

1. Choose a concept;
2. Teach it to a child or someone without prior knowledge in the field;
3. Identify gaps (you won't notice these gaps in your knowledge if you don't do the verbal explanation exercise — that's why it's crucial!);
4. Improve & repeat.

Participate in seminars, organize reading groups, [write about it publicly](#), tell your friends, spouse or kids what you read about today – get out and socialize 😊.

If there is no one around who is interested, try talking to yourself.
That's what I do ... but maybe I'm crazy.

Shane is not, because the second strategy for optimizing recollection has you do this explicitly. It's called [active recall](#).

This technique has you explain the relevant ideas out loud, without peeking at your notes, as if lecturing an imaginary class.

As with most of the methods described in this guide, active recall requires more mental energy than the alternative. But in exchange, it allows you to learn the material better and in much less time.

Conclusion: the cycle of learning

Many of us want to *get* something from the books we read, yet also believe acquiring information and learning are the same thing. Nothing could be further from the truth.

To learn, we need to get the information into our latticework of mental models. For a higher ROI on reading, we looked into the skill of meta-learning. We found that, to promote information from short-term memory to your understanding of the world, we need to (i) *engage with* and (ii) *reflect on* it.

The former demands we become active readers. The right reading strategy for this depends on your goals. We've covered mindmapping with bullet-point notes, on the one hand, and the QEC method with upgraded marginalia and nightly questions, on the other.

The latter is best done by implementing a system to ensure regular review (every time you start a related book, for example). The best ways to ensure constant progress in understanding are active recall and the Feynman technique.

If you get into the habit of active reading, your life will change.

Remember how curious you was a child? Reading and learning will turn into an amazing adventure, and the world will once again be full of mysteries.

You'll become a highly creative person.

Personal growth will once again be something *you* own, rather than something you had an awkward relationship with since [school trained you into a one-trick pony](#) and you lacked the confidence to venture further.

You'll get flashes of insights during random moments every single day.

People will start noticing your ability to make connections, understand situations as one of those and point out cool, unexpected features they could never have noticed themselves.

You'll get tremendous joy and relationship growth out of sharing this new attitude and knowledge with others.

They will suddenly respect you as the go-to wise person and compliment you for nourishing your intellectual interests.

But above all, this feeling of progressing deeper and deeper on your quest for understanding is simply the best there is.

Want to [level up](#)?