



MINI LIBRARY OF TERMS AND STRATEGIES THAT TRANSFORM HOW YOU LEARN

30 Terms You Should Know Well

This is your resource mini library of important and powerful learning terms and strategies. Each is explained in simple terms with references to other resources of more information. Get familiar with them and talk to your kids about using them. Incorporate them into your instruction. When you help your child know and use them, their learning maturity improves. Your goal should be, over time, to incorporate all of these into comfortable and frequent study habits.

How many do you know?

Here's some of the great ideas in this document:

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LEARNING HOW TO LEARN

Why you need this: Most people don't understand how learning really occurs. When your child knows how, he or she will be able to select much more effective strategies for learning.

It's shocking to think about how little attention we devote to the science of learning, especially when we consider how long this knowledge has been around. Most schools do not teach the science, and most of us as adults weren't taught it so we can't pass it on to our kids. Because all of us have a reasonably minimal capability to learn things, it seems to work OK so we don't tend to think much about how we might do it better. Except when our limited skills suddenly become inadequate, such as when we enter a college environment, get promoted, or find our jobs outsourced to a machine. By then, when confronted with all to learn in a short period of time, we discover it's a little late to start developing better skills.

Lets' face it, the term "learning how to learn" is lacking in sex appeal. It's something we pass over as "I know it when I have to do it." And yet in a world of constant and disruptive change, the ability to learn rapidly and efficiently is a highly valued and potentially life-changing capability.

The skills of learning how to learn are important and should not be pushed behind academics. Expert leaning skills are worth it. They enable college-readiness and open broad life horizons and career choices. And they are not that hard to teach when you have a resource to support you.

As a homeschooler, you emphasize academics and hard work. You strive to improve your child's knowledge and mastery of many subjects. Don't neglect teaching this vital capability. Don't stop with a few pointers on how to study, dig down and get into the world of evidence-based learning strategies. Some are covered in this mini-library. Learn more about them, and then help your child learn how to turn them into every day study practices.

Approach "learning how to learn" as an important discipline you teach and coach that warrants practice and effort to master. Student who are expert and confident learners are much more likely to be successful in college-and life.

RETRIEVAL PRACTICE

Why you need this: We typically focus on one thing when we instruct – encoding or getting information into the student's heads. One of the most robust findings from cognitive science research is the importance of also getting information *out of* student's heads.

Emphasizing retrieving can transform both your home instruction and how your child studies. It has the tremendous benefit of improving retention and memory.

Retrieval consists of these 3 steps of learning:

Encoding – this describes the efforts the student makes to input the information so it will be remembered

Storage – this is the process of keeping the information for the purpose of forming longer term memories

Retrieving – these are the efforts the student makes to try to pull out or retrieve the information

The key principle is: *the process of trying to retrieve something makes the information more retrievable later*. Learn to periodically pause your teaching, presentation, or reading and ask your kids to try to recall the information without looking at their notes. This is much more effective for learning than layering on more input strategies such as rereading a chapter or relooking at your notes.

Retrieval practice involves trying to recreate something you've learned recently from your memory and thinking about it. The important point is to wait a short while *after* you've learned something by reading it in a book or hearing it in class, just when you are starting to forget it, then try to bring it to mind (or "retrieve" it).

You should be deploying lots of retrieval exercises while you instruct, not just at the end of the lesson or learning experience. (For example, see the term [*Stop and Jot*](#)) Because this is so powerful as a learning tool, you should be teaching and encouraging your child how to do it during individual study. The reality is that most students don't do enough of it.

Here's a great tip: Don't ask your child what she learned *today*, ask her what she learned *yesterday*. Encourage retrieval.

For more information go to the term [*The 50-50 Rule*](#).

BJORK AND DESIRABLE DIFFICULTIES

Why you need it: Science has shown that the brain learns best when we operate at the edge of our abilities, just outside our comfort zones, where we make mistakes to uncover what we don't know.

Parents and students may find this somewhat counter-intuitive – most people think *comfortable* learning is preferable, where the student attempts to minimize or avoid mistakes. This is just plain wrong for optimal learning.

Study and practice that use the same routines, repeat similar activities, and "play it safe" to minimize mistakes are all less effective learning strategies. Robert Bjork coined the phrase "desirable difficulties" in 1994. Desirable difficulties are beneficial because they trigger encoding and retrieval processes that support learning, comprehension, and remembering.

Desirable difficulties (DDs for short) are those learning activities that are more effortful yet successful, but they may cause students at first to struggle a bit as they adjust to this approach. They are better for improving long-term learning of the information.

Decades of research have shown that fast, easy strategies lead to short-term learning, whereas slow more effortful strategies lead to long-term learning. This is a *bedrock principle* that supports most of the evidence-based strategies described here. Explain it, understand how it works, encourage it – do it!

Promote DDs through better study planning so this strategy is incorporated into all your child's study efforts. Show your child how to frequently change and adjust learning and training activities

to make them a little harder. With it, encourage better metacognition so your child can identify studying and training has gotten too comfortable so he or she can then change the activity to make it slightly more difficult.

To learn more about this strategy go to [Desirable Difficulties can Transform Your Learning and Teaching](#) or sign up for our online course [Pa 10](#).

INTERLEAVING VS. BLOCKED PRACTICE

Why you need it: Interleaving will greatly improve the long-term retention of information your kids learn. It makes studying and practicing more engaging as it mimics how that learning will be used in real world situations. Most learners do too little of it – but nowhere near enough.

Interleaving does this by encouraging the student to discriminate between similarities and differences. It encourages the right kind of decision making. To do it, you intentionally and frequently vary the order of practice or retrieval during your teaching and study sessions. It has the power to more than *double* student learning!

Interleaving is superior to “blocked practice,” which is where the student focuses on the same activity for longer periods of time.

Here an example where each letter represents a different learning activity:

*Set 1 - **Blocked** practice:* AAAA BBBB CCCC DDDD

*Set 2 - **Interleaved** Practice* ABCD CBAD ABCD BACD

To explain, if the letters represent *addition, subtraction, multiplication, and division*, then students in set 1 can “*plug and chug*” (not a good thing) on each without even thinking about the strategy! The student puts in the effort - but gets lower levels of learning. Worse, it may not simulate what happens in the real world, which could mean they can’t do it when they need to.

In set 2, students have to choose and retrieve the right strategy every time there is a change which forces them to think deeper and results in much better learning. This more closely simulates what happens in the real world, such as taking a test, where the strategy is not provided. (Is this an addition or multiplication problem?)

If you train for a sport using the set A blocked practice, you will have difficulty selecting the right strategy when you need it. For example, the pitcher throws you a curve ball, but you react as if it’s a fastball.

From research, participants who practice under interleaved conditions perform far better than the blocked practice participants. Why? One explanation suggests that interleaving *forces learners to reload memories*.

Your kids will learn better when they frequently interleave. They will learn better when you incorporate this into your instruction and learning experiences. For example, to learn the words to a new song, practice them differently. After going through the song several times, change it up - Start with verse 3, then do verse 2, then verse 4, then verse 1. Try this approach! It’s going to be a little harder at first, but recognize your kids will be learning much more in the same amount of time, and after a while, this will become a natural habit for learning and training sessions.

Research illustrates that learners, as well as instructors, are at risk of being fooled by the “*illusion of knowing*” that accompanies training using the same repeated activities that result in familiarization, but not long-term learning.

Also refer to the Bjork’s [*desirable difficulties*](#) principle.

DELIBERATE PRACTICE

Why you need it: If you want to gain skills rapidly or approach expert-level status at anything, you must understand the importance of deliberate practice.

Deliberate practice is not just focusing and concentrating on your studies. Use it specifically when you want to improve your expertise.

There are 6 components to deliberate practice:

- 1) *all study and practice activities are planned and intentional,*
- 2) *stay outside your comfort zone,*
- 3) *aim at improving performance,*
- 4) *design practices for your current skill level,*
- 5) *plan for frequent and immediate feedback on your performance,*
- 6) *and build training on existing frameworks of knowledge.*

When you desire to reach expert levels of performance in any field or endeavor, you will need to know how to incorporate all of these into study and training. Expert performers are not more talented, they get that way because they know how to use deliberate practice.

“We agree that expert performance is qualitatively different from normal performance, and even that expert performers have characteristics and abilities that are qualitatively different from or at least outside the range of those of normal adults. However, we deny that these differences are due to innate talent. Only a few exceptions, most notably height, are genetically prescribed.”

– K. A. Ericsson

Learn more about how to do this in our online course [Pa 10](#).

METACOGNITION

Why you need this: Knowledge acquisition is supercharged by a skill called metacognition. The aware learner adapts strategies that not only help her input the information now but enables her to retrieve it later.

Meta means “about,” and cognition applies to thinking and all the mental processes that come with analyzing, reasoning, and rationally processing your perceptions. So, metacognition is simply *thinking about your own thinking*. It’s a heightened level of your own process when learning.

It sounds simple, but it's not an automatic thing. Have you ever experienced reading a chapter, putting the book down, then realizing you can't recall anything from what you just read? This is a common experience when we suspend our metacognition. It happens.

Your child's metacognition is important skill to better learning and one that is mastered to get to higher levels of learning maturity, such as activated or lifelong learning.

Every time you become aware of a particular learning strategy you are using, or you deliberately choose to switch from one to another to achieve some goal, you are practicing metacognition.

Good students think strategically about how they will study and what tools they need to use. They also more actively assess the status of their comprehension; they know when learning is working well or not. Those with higher metacognition can make better adjustments to their strategies to improve learning. Students at the higher learning maturity levels Activation and Lifelong Learning have become skilled at it.

Metacognition is not tied to intelligence and can be taught and learned through your supportive coaching. Knowledge of better evidence-based learning strategies allows for greatly improved metacognition. The more you know about learning really works the better choices you can make.

Poor metacognition is common. Here's an explanation of one aspect of the problem:

“All too often, students just jump mindlessly into studying before they have even strategized what to use, without understanding why they are using each resource, and without planning out how they would use the resource to learn effectively,”

- Patricia Chen, a postdoctoral researcher at Stanford.

This is another reason you should implement weekly Study Planning and Review meetings. These provide you the opportunity to have conversations on building better metacognition.

For more information on this topic and SPR meetings sign up for the [Pa 10 online course](#).

LEARNING MATURITY

Why you need this: You'll have a much easier time systematically improving your child's learning skills when you understand learning maturity. It will be harder to improve your child's learning skills when you don't have an assessment of where their learning maturity is now.

Learning maturity provides a useful framework for understanding and discussing learning skills. Striving for higher levels of learning maturity will translate into more effective and efficient learning. Much like other types of maturity, like mental, physical, or emotional, it describes a logical progression of personal growth over stages. It consists of learnable skills, habits, and methods that can be acquired through practice as well as attitudes and mindsets about learning. It is not connected to intelligence, personality, or physical age. Anyone can get more of it.

The five stages of learning maturity can be remembered by the acronym RECALL. Resistant, Enlisted, Capable, Activated, and Lifelong Learner. Most children who are not trained in the use of evidence-based learning strategies will reside at the first two levels, regardless of how successful

they are as students. Adding strategies, better habits, and improved metacognition moves the child up the continuum.

Students who are at higher levels of maturity have command of more evidence-based learning strategies, take a more disciplined approach to study, and operate at higher levels of metacognition. Parents can support growth of learning maturity through better study planning, teaching better learning strategies, and by providing coaching and encouragement.

The importance of learning Maturity is often greatly underestimated in the pursuit of college-readiness. Adults who are mature at learning will have a much better time navigating in a world of constant change because they will find it easier to adapt and learn new things.

SPACED PRACTICE VS. MASSED PRACTICE

Why you need this: Science shows that it is better to space learning sessions apart than doing them all at once (which is called “massed practice”).

Spaced practice is one of the most powerful learning strategies and you need to frequently practice this with your homeschooling.

For example, four 30-minute study sessions over two weeks, are much better than one two-hour study session. Although *massed practice* (such as cramming for exams) supports short-term performance, spaced practice supports long-term retention. The benefits of spacing on long-term retention, called the spacing effect, have been demonstrated for all manner of materials and tasks.

Try this experiment - take a subject where in the past you have studied for two hours in one day. The next time you study it, break this into half hour sessions every other day for 4 sessions. Then compare the difference.

When students encounter information repeatedly in one session, it quickly becomes familiar—what we call an “illusion of knowing.” Familiarity creates the impression that learning has occurred, when it has not.

However, when information is quickly acquired, it’s often quickly forgotten. Because this fundamental learning strategy is so effective, we stress the importance of your incorporating spacing and avoiding massed practice in your instruction and your study plans.

The best place to encourage and promote greater spaced practice is in your SPR meetings. Learn more about this by signing up for our [Pa 10 Course Improving Your Child’s Learning Power](#).

For more information on how to set up weekly study planning meetings go to [This Meeting is the Best Way to Improve Your Study Strategies](#) in our Parent Resources

POMODORO TECHNIQUE

Why you need this: The brain easily fatigues when studying without breaks and quickly reaches diminishing returns, which often go undetected by the learner. Shorter and more intense study sessions have been found to promote better learning.

This term was coined by Francesco Cirillo in 1980’s and it means “tomato” in Italian.

It was named after a small cute little kitchen timer, and we like to feel it is our “mascot” here at the Center.

Barbara Oakley, noted author and learning expert, breaks down this particularly effective technique. Here is how she suggests you can get the most out of this strategy:

1. Turn off all notifications, phone noises, and other distractions.
2. Set a timer for 25 minutes.
3. Dedicate that full 25 minutes to conscious, intentional study.
4. Without getting frustrated, let distracting thoughts come in and out of your mind as you refocus on the learning at hand.
5. Following the 25 minutes, give your brain a break and occupy your thoughts to anything other than the subject matter. This will help solidify the knowledge.

“Note that within this decompression time following the activity, that learning occurs the most – once the brain switches gears to a retention-driven mode.”

Organize all of your study into shorter bursts of intense study followed by short breaks. This is much better than longer sessions that fatigue the brain.

To better understand how this incorporates into your child’s learning, complete the online [Learning Strategies Assessment](#).

CURSIVE WRITING

Why you use it: Numerous scientific studies prove that cursive writing is more effective for learning and remembering than typing on a keyboard. You probably expected or hoped this was as a homeschooling parent! So now you know!

This science demonstrates cursive is better because:

- *It has superior encoding effects*
- *It avoids our tendency to mindlessly transcribe when we type*
- *It forces us to synthesize and summarize*

Most homeschooling parents emphasize the practice of using cursive writing – you accept it as a good practice but perhaps without knowing why. Share this with your kids that research supports this as a superior learning strategy over digitizing information on a keyboard! (of course, the keyboard has its place in learning and writing, just not as your primary note taking vehicle.)

New research by Pam Mueller and Daniel Oppenheimer demonstrates that students who write out their notes on paper actually learn more. They conducted a series of studies where half the students used laptops and half cursive. Here’s what they found.

Typing on a computer produces more notes, but not better. Cursive:

- *results in superior conceptual understanding*
- *is more successful in applying and integrating the information*

The typing student can produce much more, but without having to think about it. Typing produces better records, not better learning.

What happens with typing?

- While typing is faster and students tend to write much more, they remember less because the focus is on quantity, not understanding.

The science of learning helps us affirm those study strategies we believe to be desirable. This is the good news. Now what you will need to do is work on better note taking techniques. See [Cornell Note Taking Method](#) for better ideas.

CORNELL NOTE TAKING METHOD

Why you need it: It's a fact that most students don't know how to take good notes. Effective notes, whether reading or in the classroom, should be conducted for the purpose of improving memory. But most students treat them as little more than a reference or summary tool.

Good note taking accomplished much more than this. The skill of digesting and thinking about new information is not the same as building your shopping list!

First, it's not effective to just sit and read the textbook passively; you need to write stuff down, and in a way that improves your brain's cognitive skills, makes retention of information easier, with the purpose of boosting memory.

Effective note taking should be treated as a personal memory system and not just a way of creating reference notes. In order to improve, you have to shift your thinking about the purpose of your notes.

There are many effective note methods, but the Cornell is perhaps the best known. It was developed in the 1950's, like many learning strategies it has been around for a long time, but somehow it still remains largely unfamiliar to students and parents.

A good note taking method is designed to help the student understand more deeply, synthesize information, and of course to create something for review. Here's how it works.

Before use, the student divides the note page into three sections as follows.

Create a left third or sometimes one quarter of the page, by drawing a vertical line which creates a section on the left you use for recording headings and key words. This is also where you might pose key questions that you need to answer when you have scanned the chapter in advance. No details are recorded in this area - just key ideas. This forces the student to focus and organize information which will improve memory.

The larger area to the right of the vertical line is where you record the more detailed points in bullet or outline form. This is also the area where you can create diagrams or mindmaps to show relationships. This is your detail section, and the important task is that information is written down in the student's own words, and not merely transcribed from the source. This forces the student to think about meaning and make connections to information already known.

The bottom of the page is separated by a horizontal line where a small area exists for the student to summarize the major ideas at the end of the reading or classroom session. Summary of key

ideas is important – don't skip this section. It completes the thinking process which should accompany note taking.

Each section in the Cornell method serves a distinct purpose. There are plenty of online videos which provide examples. You may also visit [Parent Resources](#) for more information.

CHUNKING AND WORKING MEMORY

Why you need it: If you don't understand chunking information and the limits of working memory, you are probably trying to teach too much at once or suffering learning overload as a student.

Key Point: Science tells us our working memory is restricted to holding only about 5 to 7 bits of information at a time. This often is referred to as:

The “5 plus or Minus 2” rule.

This is important to know – there is a limit to working memory which means when you teach new information, the amount of new ideas provided should be no more than 5 or 7 things at a time. Then you work on practicing it until it gets transferred from working memory to long term memory. From this you can move on, clear working memory, and introduce more new information into working memory.

So working, or short-term memory, is like a desktop. It's not intended for long term storage.

Limited working memory has implications for both teaching and studying. Each lesson should introduce no more new information than can be handled by working memory. Your activities and exercises which follow are designed to move it deeper into the brain where it will be remembered.

The all too common tendency of many instructors is to do an information “dump” which provides too many bits of information, then at the end of the lesson they go back and review it. Avoid this practice as it results in confusing overload and much less learning. Plan your lessons in chunks.

One useful shortcut solution is to learn to “chunk” information into single bites so that you can have more to work with. An example of this is to take four digits like 2, 0, 1 and 3 and combine them into a memorable unit like the year 2013. Thus, you have combined four into one, effectively increasing your working memory capacity.

In summary, effective learning, after one has processed something in working memory, involves transfer of it to long term memory so that the information is accessible when needed. This is how you should be teaching and organizing your lessons.

You can learn this teaching technique and others in our upcoming expert and confident homeschooling teacher courses [Pa 40](#) and [Pa 400](#). Go to [course information](#) for more detail.

THE 50-50 RULE

Why you need this: The 50-50 rule emphasizes retrieval-based learning as one of the most powerful tools for increasing student learning and retention.

Start this as a habit for younger children so they learn the benefit of **IN**formation and **OUT**formation.

This is a rule that applies to more effective studying. It points to two types of studying – which we call **IN**formation and **OUT**formation. Practice both.

INformation refers to what we mostly do when studying and reading - trying to get new information into your brain. **OUT**formation is those efforts when you try to recall and pull out that information by trying to recall it.

Practice the **50-50 rule** – which means when studying it is best to spend half your time reading and inputting information, and half your time trying to retrieve or recall the information. Do both and you will learn and retain much more information.

Knowing that doing both are important will transform your teaching strategies and how your child studies. Overreliance on **IN**formation results in less effective learning and teaching.

An example of **OUT**formation is trying to recall the key points of a lesson, without looking at your notes. It forces the student to pull our knowledge out and examine what we know. Initially, kids will find this harder, but with practice this is a much more effective short-term and long-term learning strategy.

As an instructor, the 50-50 rule means frequently stopping and asking your students to try to independently recall major points and facts that you just covered without looking at the book or references on the board. Develop this as a instructional “rhythm” of your classroom. Create the habits for successfully recalling information.

Visit [Parent Resources](#) for more information.

FEYNMAN TECHNIQUE

Why you need it: This learning strategy helps you identify the gaps in your knowledge.

Richard Feynman, a celebrated scientist and the winner of a Nobel prize in Theoretical Physics, came up with a learning strategy for getting feedback to know if you really understand a topic. It’s so amazingly simple you might be inclined to dismiss it. But don’t.

The Feynman’s technique is a clever way to test your knowledge – without using the new words or jargon which you have just learned. Take a new idea and try to rephrase what you have just learned in your own language. Present this to another person, or pretend to do so.

The Feynman technique is a specific application of the strategy of elaborative interrogation. Remember, the goal is to identify what you are unable to answer—that is the useful feedback it provides the student.

Expert learners know the importance of identifying your blind spots – the things you think you know but don’t. They want to fill the very real gaps in their knowledge. They feel they are successful when they find these holes in the knowledge. Less mature learners are reluctant to do this because they are uncomfortable with making mistakes, they don’t recognize this as an important aspect of learning.

Here are the four steps of the Feynman (pronounced “fine man”) technique:

1. *Pick a topic you are trying to understand or have recently learned.*
2. *Take out a blank sheet of paper. Write it down as if you were teaching it to someone. Write it in plain English. Or try to teach it to someone.*
3. *Find your blind spots – the things that are unclear, fuzzy, or that you can’t remember. Go back to materials when you get stuck. Read enough so you can now fully explain it.*
4. *Simplify and create an analogy*

Put simply, he says the measure of whether we have understood something is if we’re able to successfully explain it to a five-year-old. So, don’t be reluctant to Feynman you younger brothers and sisters!

Remember, Feynman won a Noble Prize – there is deep insightful thinking behind this technique. Try it! And do it often.

This strategy is a form of retrieval practice. To learn more, refer to the article on [retrieval practice](#) in our parent resources section.

MEMORY PALACES AND MNEMONIC DEVICES

Why you need this: To get to the higher levels of learning maturity, you child should have command of multiple tools to improve remembering and recalling information.

The brain is hardwired to remember things that have sensory connections. The key principle to recalling information is – *the more senses involved with encoding information the better*. The more neural paths you form, the more likely you are to recall information. This is the reason many people use songs and rhymes to help students remember and recall information.

You most likely are using this - examples of mnemonic devices are in the songs and rhymes you use. The memory palace can take this to another level.

Our brain’s emphasis on remembering sensory things is also the reason why it is difficult to remember numbers and facts, unless they are tied to experiences or sensory information. The ancient Greeks understood this and created devices to help them remember things.

A “memory palace” is used to record information so that it can more easily be remembered and retrieved. You can create memory palaces using rooms or items in your home, or even parts of your body. Once you create a memory palace, it serves as the anchor point for associating new information with a specific location in your palace.

You can find some interesting [videos on memory techniques](#) in our parent resources.

SELF-TESTING

Why you need this: Laboratory research has demonstrated the power of tests and quizzes as learning events.

Most of us tend to think about testing as something for measuring learning and retention. While this is true, frequent self-testing of material should also be used as an excellent learning strategy!

For this reason, testing as a learning tool is greatly underused. And the role of creating tests and quizzes is not the sole responsibility of the teacher. Students need to be taught how to create these on their own.

The use of self-tests are part of the strategy of *retrieval attempts* which is considerably more effective to long term memory than reading material over and over. This is why you want to teach your kids the habit of frequently testing themselves when they study. This is a learnable skill, don't expect them to know how to do this well at first. Provide some coaching.

Students learn better by quizzing themselves on new information. For example, at the end of every chapter, they should develop the habit of taking out a piece of paper and trying to list all the major points. At first this will seem a little harder, and feel like an extra step, but with practice they will see the big benefits of doing this. This step reduces the need for time wasting rereading and helps them zero in on those things they did not get correct the first time.

Most students will resist doing this at first, because they do not understand the benefits. Your job as coach is to get them to practice this until they do and it becomes a comfortable habit.

Point out it's easy to create self-tests if you properly take notes to prepare yourself for it. For example, set your notes up in two columns with terms on the left and definitions on the right. Then use your hand to cover one column and test yourself. Go back and forth.

Self-tests are a form of the strategy of retrieval practice. For more information, refer to our article on [retrieval practice](#) in parent resources.

ZEIGARNIK EFFECT

Why you need it: Surprisingly, completing all of a task in one sitting, is not always the best thing to do for learning. Stopping before you finish that paper and then finishing it tomorrow can be better.

This is an example of a counter-intuitive strategy that kids may resist at first. This strategy effect states that "*we remember 90% more of interrupted assignments than finished ones.*" Take advantage of the fact that unfinished jobs linger longer in memory than finished jobs.

This is another powerful but counter-intuitive strategy that points us to the advantage of not completely finishing the work in one session. This of course runs counter to the traditional productivity discipline of getting it all done in one session. But this is a strategy for *learning* and *retaining* more. Instead, coach your kids to do most of the work on a project or assignment, then stop and let the remaining information ruminate in your mind.

Pick up the next day and finish the work with the added benefit of your diffuse thinking having worked on the problem. Note – this is an intentioned strategy that is not the same as procrastination.

Coach your child on the study habit of planning to *complete at least half* of that assignment, then finishing it the next day after they have slept on the ideas.

For more on this and other evidence-based learning strategies sign up for the [Pa 10 course Improving Your Child's Learning Power](#).

DUNNING-KRUGER EFFECT

Why you need this: In learning any new domain, our confidence in our capability is actually highest when we start learning. Because of this, most kids will initially resist attempts to improve their study skills because they overestimate their own abilities.

This counter-intuitive effect is attributed to psychologists Justin Kruger and David Dunning who introduced it in 1999. It essentially states – *people of low ability suffer illusory superiority and mistakenly assess their ability as greater than it is*. It's a cognitive bias that has the very real problem of inhibiting learning.

It has also been described in less-than-scientific terms as the “Above Average” effect or the “Lake Wobegon” effect. It's a real and pervasive human phenomenon that can be self-limiting to your kids' growth.

Simply put, most people absent good and specific feedback, overestimate their own abilities. You probably already knew this, but now you have a name for it, and you should understand it as a barrier to learning and improving. Or another way to put this is “the more you know, the less you are certain you know.” Or, as the philosopher Bertrand Russell famously put it: “The trouble with the world is that the stupid are cocksure and the intelligent are full of doubt.”

When people overestimate their own ability, they are much less inclined to want to improve their situation as they will not see the need to do so. We know from experience, the parent who overestimates their child's learning maturity will be less likely to engage in efforts to improve it. Don't allow your kids to get trapped into learning mediocrity because of the Dunning-Kreuger effect!

The Dunning-Kruger effect helps explain why human behavior often seems illogical. We observe other person not learning from his mistakes and wonder why. We question why someone is doing something that seems foolish to us. We might wonder why this person keeps skipping an important step. Each of these actions might be explained by this effect.

The solution to the Dunning-Kruger effect is self-knowledge through good information and feedback. This is why we recommend you complete the [LSA instrument](#) on learning strategies, as you will benefit from this insightful report. Don't get caught overestimating your child's current learning maturity and miss a step!

Whenever you attempt to change the behavior of others, you should recognize you need have a plan to deal with resistance that will come from this effect by getting and giving feedback.

For more information, see our video in the [Pa 10 course – Improving Your Child's Learning Power](#).

“SELF-SCIENTISTS” AND CHANGE

Why you need this: Kids are more receptive to change when they see their efforts to improve as a series of fun experiments and not a problem to solve.

Successful students at the middle school level may not see a need to improve their use of learning strategies to get ready for college. (see the term [Dunning-Kruger Effect](#)) It's too far away. They

may also avoid practicing better evidence-based learning strategies because they fear failure at their first efforts to try them. (Sounds like, “see mom, I told you this wouldn’t work!”)

We invented the “self-scientist” mindset as a great approach for upgrading your child’s learning strategies. How do you get your kids to open up to trying new and better learning strategies that can make them college-ready? Easy - both parent and student become *self-scientists* who treat trying new and better ways to learn as an ongoing experiment! You try ideas and evaluate the results and understand why a new strategy works. There are no failures, only opportunities to learn.

This is part of what you make a fun trial and error process to get better. It can become part of your lessons.

To start, get involved with your kid in writing your own credo as self-scientists. What will you commit to? Post it on the wall where it is visible where you will meet. *Here’s an example.*

1. We are all about experimenting with new ideas and growing our brains
2. We remain curious about what works and why
3. There is no such thing as failure - only opportunities to learn
4. We will try new things because we are curious
5. We celebrate our “wins” and successes
6. If something does not work, we never abandon our commitment to learning

When you make it fun it’s so much easier to learn how to get better!

For more information, refer to lesson 3 of the [Pa 10 course – Improving Your Child’s Learning Power](#).

THE S-P-R MEETING

Why you need this: Helping your child become a much more effective learner benefits greatly by a forum for coaching and encouraging the trying new strategies and methods.

This means the Study Planning and Review meeting (SPR) should become your central vehicle for improving the study practices your child uses. It is where you encourage and guide your child to become a “Superlearner.” Without it, you will encounter difficulties gaining and maintaining momentum for positive change. This meeting demonstrates your commitment to your family values on learning.

It uses the **Plan, Do, Evaluate, Improve** model of continuous improvement.

In this family meeting, you have conversations on your child’s study efforts and outcomes from the past week, and then to help your child plan his or her studies for the coming week.

The three important elements you need to bring to this meeting are:

- *The student comes prepared to discuss how she studied over the last week and what outcomes were achieved*

- *The study journal the student has recorded of his study practices and outcomes for this last week*
- *You the parent acts as parent coach who leads the meeting and encourages and helps your child continue to improve her study strategies and efforts*

Do not confuse this with your many other conversations on completing assignments, or with your ongoing teaching efforts. This meeting needs a different tonality that *sets the stage* and *provides a forum* for open conversations, explorations for you as *self-scientists*, and your coaching about better learning.

The SPR meeting should be designed to help you encourage greater *metacognition* (thinking about thinking) and to hold your child accountable for using better study strategies.

It should also be a fun family meeting that your kids look forward to, because it provides an open table for evaluating your experiments, celebrating successes, getting support, and promoting creative thinking about how to get better. It provides the “fuel” that drives your continuous improvement efforts to much higher levels of learning maturity.

To learn more about this go to the free article on [This Meeting is the Best Way to Improve Your Study Strategies](#).

COGNITIVE-PROCESSING LANGUAGE

Why you need this: It’s your “teacher talk” that guides young learners on how to think in your home classroom.

This technical sounding term is another way to describe your “teacher talk” when you encourage your kids to think deeper about their own learning. It includes your questions that encourage kids to engage in trying to retrieve information and your prompts to encourage specific types of thinking or behavior. Note these questions have a different purpose than your other questions to clarify, check understanding, or try to shape thinking.

When you use “cognitive-processing language” you are guiding and leading with the intention to improve your kid’s memory abilities and to encourage their classroom learning. This is why we like to distinguish them from the other practices you do.

Examples of cognitive-processing language include:

- **Deliberate memory demands** (“Who knows the first step we take when building a new structure?”),
- **Learning strategy guidance** (“If you are having trouble thinking of ways to connect the wheel and axle, you can look at the diagram to help you.”), and
- **Metacognition prompting** or requests for students to think about their thinking (“How did you figure out which pieces you would need to build a sturdy structure?”).

This cognitive-processing language seems to be particularly important to developing students’ ability to strategically solve problems.

First-graders in classrooms with frequent cognitive-processing language were more likely to use complex memory strategies at the end of the year than students in classrooms that were low in

cognitive-processing language. Also, 1st and 2nd graders in an afterschool program learned more strategies for building Lego cars when they were taught using high levels of cognitive-processing language.

Incorporate this into your lesson plans.

Also see our article [Teach Your Kids Metacognition](#) in the parent resources section.

RETRIEVAL VS STORAGE STRENGTH

Why you need to know this: When you understand that storing information is different from retrieving it you can become a better learner and overcome the common *illusion of knowing*.

According to Elizabeth Bjork, who worked on a theory of forgetting along with Piotr Wozniak, long-term memory can be characterized by two components — *retrieval strength* and *storage strength*.

- *Retrieval strength* measures how likely you are to recall something right now; how close it is to the surface of your mind.
- *Storage strength* measures how deeply the memory is rooted meaning how long it will last. It's hard to determine this at the moment of learning.

They are not the same. A student who just read a passage and can recall the information may have short term *retrieval strength* because of its recency, but little *storage strength*. But the student may not be anticipating the inevitable forgetting curve. When kids confuse retrieval strength for storage strength, they may falsely assume they will be able to recall the information a week from now – when they won't be able to.

That information is only near the surface and the student has not yet taken efforts to get the information deeper. This situation is also identified as the *illusion of fluency*.

This illusion is a problem because the student who thinks she has committed something deeply to memory but who really has not, is not going to take actions to correct this problem.

Explain this to your kids. It's important!

Also refer to the term [Dunning-Krueger Effect](#).

THEORY OF FORGETTING

Why you need this: The student who is not aware of how forgetting works is unlikely to adopt better learning strategies to address this reality.

German psychologist Hermann Ebbinghaus was among the first scientists to perform experiments to understand how memory works.

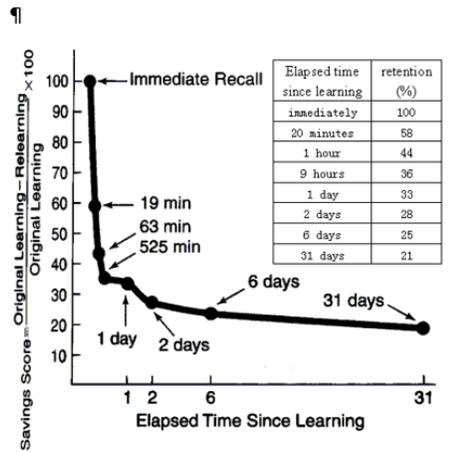
He discovered through his experiments of memory that without memory techniques or learning strategies, in one day half of all information is lost after reading or being exposed to it, and 80% of information is lost in 48 hours. And this rate continues over time.



This is called “memory decay” and once you understand it you can begin to transform your approach to learning. If you don’t realize this happens to everyone, you can be trapped with the inefficient strategy of seeming endless review in your attempt to remember information.

Or worse, if you don’t know how to help prevent this, your kids might wrongly blame or falsely label themselves as being “poor learners.” And this is unfortunate because it puts them at risk of giving up as capable lifelong learners.

This is the fundamental rationale for learning about the science of learning. It keeps you from falling into the traps of poor learning practices. Don’t get stuck in a sort of “**Groundhog Day**” effect like the Bill Murray movie where you keep repeating the same study sessions over and over and never get better.



Single-exposure-retention-in-hours-with-no-strategies-or-techniques

To learn more about this sign up for our Pa 10 course [here](#).

THE POWER OF TINY GAINS

Why you need this: Most change efforts fail because they try to tackle too many things which overloads and discourages the person they are attempting to help.

We have a natural and well-intentioned tendency to tackle the big projects because of the large gains we desire to achieve. This is especially true for our kids and their learning where the benefits are so numerous. But this “go big” strategy fails to consider human behavior and motivation.

The author James Clear, who is an expert on habits, promotes the power of thinking about “tiny gains.”

If you want to successfully change habits, it involves continuous improvement with dedication to making small changes and improvements every day, with the expectation that those small improvements will add up to something significant. This is good stuff.

He says, “The typical approach to self-improvement is to set a large goal, then try to take big leaps in order to accomplish the goal in as little time as possible. While this may sound good in theory, it often ends in burnout, frustration, and failure. Instead, we should focus on continuous improvement by slowly and slightly adjusting our normal everyday habits and behaviors.”

When it comes to improving your child’s learning strategies, use your weekly **SPR** meeting to focus on continuous improvement and these important activities:

- Conversations that continue your journey to smarter study and better learning

- Practice of more and better learning strategies for more effective study efforts
- Improving your child's metacognition or thinking about her own thinking
- Developing greater student accountability for smarter use of his study time

For more information on this, sign up for the [Pa 10 course – Improve Your Child's Learning Power](#). Also see [The Power of Tiny Gains](#) in our parent resources section.

STOP AND JOT

Why you need this: It's an important but easy-to-use classroom teaching tool to encourage the retrieval of information.

It's an active teaching technique that you should use multiple times every day to encourage *retrieval practice*, and it does not take much time. It's an easy to use technique to start doing more retrieval practice. Don't let the simplicity fool you – it's a powerful learning tool.

S and J provides an alternative approach to kids taking notes during lectures and presentations. During your class presentations, lecture and answer questions as you always do, but then pause then ask your kids to individually write down notes of what they just learned. Close the student books and cover the whiteboard – this is practice *retrieving* not a review session.

After the kids have made their notes, have a discussion of what they learned. Correct and explain where needed. Do this several times during a lecture, reading, or presentation. Note this is different from the traditional approach of kids taking notes while you present, but it's more effective because it benefits longer-term retention.

See the term [Retrieval Practice](#) for more information.

THINK PAIR SHARE

Why you need this: This is a simple but effective teaching technique you can frequently use as another method to encourage the learning strategy of *retrieval practice*.

T P S is used during your lessons at logical breaks, or at the end of the lesson.

It provides a useful change in classroom activities to get kids thinking about what they are learning. It works with these 3 steps:

Kids individually first **think** about a topic in response to your asking an insightful question or discussion prompt. They may take notes to record their ideas, but without discussion.

Each kid **pairs** up with another to talk about their own reflections or insights.

Each student pair then **shares** their thoughts to the larger class or to you

Your question or prompt is the trigger that motivates the exercise. Be creative in coming up with something that provokes student thinking, summarizing, and retrieving. ("Let's think pair and

share – list what you think are the three most important facts we just covered on George Washington.”)

Keep it simple and make it interactive. Think TPS.

EXPECTANCY THEORIES

Why you need this: This is a useful class of theories that can help you improve student motivation, or your kid’s motivation in general.

These state that student motivation to complete a task depends on both the **value** and attractiveness of the reward they anticipate receiving, along with their **expectation** that they will actually get that reward. This of course assumes that a clear and attractive reward for the student has been identified.

This is the important part, there is an interrelationship between motivation and one’s expectations. The more motivated you are, the stronger the expectation. This creates a self-reinforcing feedback loop in your child, where their expectation that they can maintain long-term motivation influences their expectation of success, and this expectation in turn influencing and strengthening motivation long-term.

This is how you encourage what is called the “spiral of effectiveness.” You promote two things in your child – you encourage a stronger vision of a positive future when they become a more effective learner, and you promote confidence that they can get that reward by giving them more powerful learning tools.

SQ3R METHOD

Why you need this: It describes an important teaching and reading comprehension method your kids should be using every day.

This method was introduced by Francis Robinson, an American educator. It provides a more efficient and comprehensive method for reading textbook material. It also should be part of your teaching method in your classroom.

The SQ3R method is another tool for encouraging a better understanding of something. It’s about getting the student to interact with more resources for better learning. Where most people may read or listen to something once and call it a day, the SQ3R stands for **survey, question, read, recite, and review**.

This means you cultivate the practice of going through five layers or steps in order to grow your understanding of something.

Survey means you should scan the material first to get the main ideas.

Question means writing questions to improve your comprehension.

Read means reading and searching for answers to your questions.

Reciting without looking helps your long-term retention of the material. See the term [*The 50-50 Rule*](#) for more on this.

Reviewing means you review the material to ensure you understand and retain it.

This should become part of your discussions of study practices during your weekly study planning and review meeting.

BLOOM'S TAXONOMY

Why you need this: This will help you teach to a deeper level of understanding. It provides a discipline for reviewing and improving your instructional plans.

Bloom's taxonomy was created by Benjamin Bloom in 1956 (though updated in 2001) as a way to measure the academic performance of college students. For homeschoolers, it provides a framework for crafting your lessons to ensure a more thorough comprehension by your kids.

It states that to reach the highest level of understanding of a subject, you need to pass through six sequential levels of learning. The idea is to progressively move your kids to a higher level of the taxonomy, which is also called "teaching up." The more you **teach up**, the better the knowledge.

The six levels of the taxonomy are below, beginning with the from lowest level *remembering* to highest level of *creating*:

- **Remembering** – Recognizing and recalling relevant knowledge from long-term memory.
- **Understanding** – Understanding what the facts mean through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.
- **Applying** - Carrying out or using a procedure by applying the facts, rules, concepts, and ideas.
- **Analyzing** - Breaking down information into component parts and determining how the parts relate to one another and to an overall structure or purpose.
- **Evaluating** - Judging the value of information or ideas based on criteria and standards through checking and critiquing.
- **Creating** - Putting elements together to form a coherent or functional whole; the ability to reorganize elements into new patterns or structure through generating, planning, or producing.

Once you hit the top level of "creating," then your child can be considered to have a deep grasp of a subject. You need to advance through each level of the taxonomy, before you can perform at the next level.

There is a more detailed [article](#) you can access in our parent resources.

THE LEARNING SUCCESS PYRAMID

Why you need this: We benefit by having useful roadmaps or models for success when learning.

The learning success pyramid, by educator Susan Kruger, identifies the necessary elements one must bring to ensure accomplishment in learning.

As a parent, if you wish to improve your child's ability to learn, you are wise to understand the three building blocks to successful learning:

- **Confidence** – starts with belief
- **Self-management** -enabled by tools
- **Learning** – follow the first two

Confidence is at the base of Kruger's pyramid which begins with the self-conviction that "I can learn this material or these things." This is an essential first step. The lack of belief that one can learn something will inhibit or prevent learning. This is why parent coaching which provides encouragement and facts about the "amazing brain" is so important. You should not assume the student is confident they can learn what you are about to teach. Past negative experiences of the child can produce lack of confidence in an otherwise confident child.

The second tier is the discipline of self-management including those things where students organize their time, resources, tools, along with the methods to ensure effective learning. These are learnable skills that involve executive function. This is where the acquisition of sound evidence-based learning strategies come into play.

The third step follows the first two. Learning does not come by itself. Most people make the mistake of thinking that learning begins here and ignore the enablers provided by the first two steps.

To learn more about this, refer to lesson two of the online course - [*Improving Your Child's Learning Power.*](#)