

# IMPROVING YOUR MEMORY

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# Memory at university

## Self-reflection questions

- What role does a good memory have in your academic life?
- Do you know how your memory works?

Memorization is one of the most common types of learning used in university. Due to the large volume of information which needs to be learned, having strong memory skills and using effective memory strategies is critical for success at university.

Memorizing comes into play at all stages of a degree but is most crucial at the outset of a program as each discipline has its own body of core knowledge. Often students complain that they have 'so much to memorize'; however, if the core knowledge is not committed to memory early in a program, the student will struggle to acquire more difficult and complex information. Moreover, some courses require you to memorize specific facts or rules, e.g., language courses. Science course (biology, anatomy) also require a large amount of information, alongside understanding concepts.

To remember all that's required to successfully complete a course, information needs to be reviewed frequently. For students who cram the course material at the end of the term will find that much of the information is lost soon after the final exam, and they will have to relearn it next term. What a waste of time!

## Purpose of this module

The aim of this module is to provide information about how your memory works and offer useful strategies to assist in the process of remembering. Although strategies involving repetition are most commonly used to assist memory, this module goes beyond simple rote memorization to whole brain techniques which will help you unleash your powerful memory.

## Themes

- I. [How Your Memory Works](#)
- II. [Whole Brain Learning](#)
- III. [Forgetting & Remembering](#)
- IV. [Memory Training: Basic & Advanced Strategies](#)
- V. [Negative Effects on Memory: substances, sleep, nutrition, etc.](#)

For those interested in a more detailed explanation, we have prepared additional information sheets and hands-on tools. You can find them in the [Tools section](#) at the end of the module.

## Self-assessment of memory functioning

### Self-reflection questions

- Would you say you have ‘a good memory’?
- Are you aware of the memory skills and strategies you use?
- Are you aware of the memory strategies which are the most effective in helping you retain and recall information?
- Do you want to improve your memory?

How good your memory is can be determined both objectively and subjectively. Dr. Gary Small, a memory expert at University of California Los Angeles, has developed two assessment tools\*, an objective test and a subjective questionnaire, which will help you assess your present memory functioning. See:

- [Subjective Memory Questionnaire](#)
- [Objective Memory Test](#)

\*Source: Small, G. 2003. *The Memory Bible: An innovative strategy for keeping your brain young*. NY: Hyperion.

### Interpreting your memory scores

Once you have completed Dr. Small’s memory tests, take a moment to find out how your scores translate into a memory skills training program.

Subjective	Objective	Program
High	High	Review basic memory skills and then move quickly to advanced skills.
Low	Low	Focus on basic memory skills training. Reassess your scores after the basic training is complete. If there’s no improvement, consult an expert.
Low	High	Focus on stress reduction before basic memory skills training.

Factors influencing objective memory score:

- age

- level of education (those with higher levels of education generally have better memories)

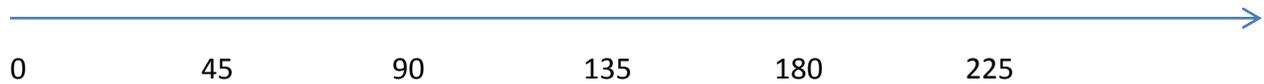
Factors influencing subjective memory score:

- mood and sense of well-being (stress and depression affects memory)

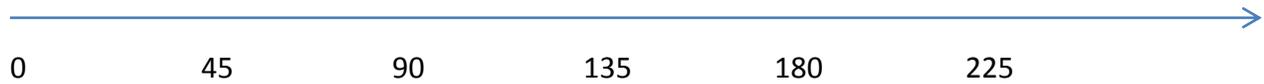
### **Continuous assessment of memory improvement**

By taking the above tests, you now know your baseline memory performance scores. You will want to revisit these scores throughout your memory training program to assess your ongoing improvement. On the continuums below, mark your baseline score with an X.

#### **Baseline: Subjective**



#### **Baseline: Objective**



## I. How your mind works

### Model 1: 3 phases

When you understand how your memory works, reviewing new information regularly makes a whole lot of sense. Memory is an active process involving **thinking** about the information, **encoding** the information and **rehearsing** the information. This happens in 3 phases.

#### Phase 1. Acquisition

**Working memory or the immediate sensory image (e.g. a picture).** This phase fades in seconds unless you pay attention to certain features or transform (encode) the information into words.

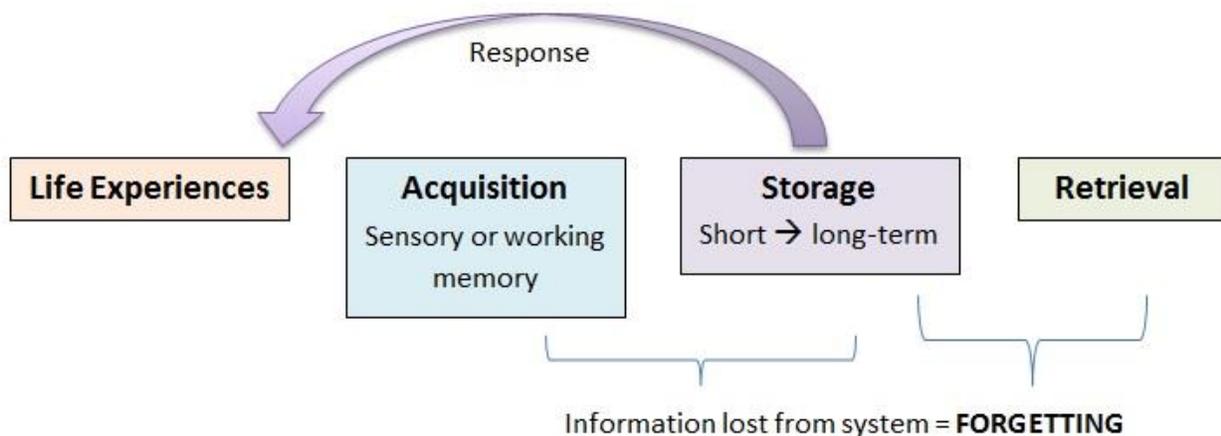
#### Phase 2. Storage

**Short-term memory or the temporary storage.** This phase is small in capacity (3-10 items) and short in duration (10-30 seconds) unless information is repeated verbally.

**Long-term memory.** This phase is the relatively permanent, large capacity storage which holds our past. 'Memorized' information is stored here, and this phase is what most people think of as their 'memory'.

#### Phase 3. Retrieval

This phase involves getting information out of your long-term storage and using it.



Adapted from: Fleet, J. et al. (1990). *Learning for Success: Skills and Strategies for Canadian Students*. Toronto, ON: Harcourt Brace Janovich.

### Model 2: 5 stages of information processing

Why is it that sometimes when you are trying to solve a problem, you simply can't and then in the middle of the night you remember? The knowledge is accessible now because you are no longer 'thinking' and have moved to unconscious levels of thought. Since the unconscious mind

is more powerful than the conscious, it's important to understand how to tap into these levels of thought. To help you understand this process, consider these 5 stages or levels:

Conscious	Bridge to Unconscious	Unconscious
1. Think stage →	2. Emote stage →	3. Look/search stage (retrieve) 4. Create stage 5. Know stage

**1. Think** – what you do consciously, e.g., analyze, compare, ask yourself questions. Information is not accessible till the **Know** stage.

**2. Emote** – To get to the Know stage more quickly, use your emotions. Your emotions are a bridge between your conscious (Stage 1) and unconscious mind (Stages 3-5). Emotions are your 'gut' feelings and are a deeper stage of your mind than Stage 1. Once your emotions are involved, you will automatically move to the **Look/Search** stage.

**3. Look/Search** – Signalled by your emotions, your mind searches for information stored in your memory. Try using the analogy of a filing cabinet (see diagram in the TOOL below) to represent everything you have seen, heard, thought is stored in files. When your mind is in Look/Search mode, imagine your unconscious mind 'rolodexing' or 'scrolling' rapidly all your files. Note that your mind doesn't always need to go through Stage 3, but can go directly to Stage 5.

**4. Create**– In the case of problem-solving, your moves through the Create stage before the Know stage, as the necessary 'files' don't yet exist. To create a new file, your mind goes through the existing files, taking bits of useful information and recombining files into something new. Usually this takes time and conscious effort. However, often when you stop 'thinking' about the problem and let the unconscious take over, the solution appears, seemingly effortlessly. When you are creating new files, you are creating new neuro-pathways in the brain, which reinforces your memory. When you create something, you 'know' it, i.e. you've arrived at Stage 5!

Therefore...**THE MORE YOU CREATE, THE BETTER YOUR MEMORY GETS.** So, when studying and learning try to create your own questions, and visuals and your memory will improve easily.

Source: Trudeau, K. 1997. *Mega Memory: How to release your superpower memory in 30 minutes or less a day.* NY: HarperCollins.

See [The Filing Cabinet of Your Mind](#) for more detail.

## II. Whole brain learning

### Brain research and memory

Traditionally, researchers thought thinking processes were divided between the two sides of the cerebral cortex like this...

Right hemisphere	Left hemisphere
Rhythm, imagination, daydreaming, colour dimension, spatial awareness, gestalt (the whole picture)	Logic, words, lists, numbers, sequence, linearity, analysis

However, the latest research indicates that we use both sides of brain together. Therefore, the more you use them together, the more they benefit each other. For example, the study of music (right hemisphere) helps the study of math (left hemisphere)  $\leftarrow \rightarrow$  the study of math helps the study of music. The more you use these areas, the more generally capable is your entire memory. **Therefore...to remember well, you need to use every aspect of your mind.**

### Two fundamentals of super memory: imagination + association

If you want to remember anything, associate (link) it with some known or fixed item (i.e. something stable in your mental environment), calling upon your imagination throughout. To remember well you need to include some or all of the following:

Senses: see, hear, smell, taste, touch, movement

Movement & Rhythm – make your images 3D

Association

Sexuality

Humour

Imagination

Numbers

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Symbols e.g. a light bulb = an idea

Colour – add vivid colours

Order and/or Sequence e.g. little to big, sorting by category, colour groupings, hierarchies

Positive Images - pleasant images are easy to remember while negative ones can block memory

Exaggeration – size, shape, sound

The acronym to help you remember the list above is...**SMASHIN' SCOPE.**

Source: Buzan, T. (1995). *Use Your Memory*. London: BBC Books.

## III. Forgetting and remembering

### Why we forget

Did you know that about **60%** of the material that you read is lost in the **first hour** after reading?

The primary reason we forget is **Interference** or 'The Confusion Factor,' eg. mental overcrowding, multi-tasking. The more similar the event or fact that intervenes, the more likely you will forget.

Other reasons we forget are

- Negative attitude or self-concept e.g. "I have a lousy memory"
- Underlearning: not learned well enough and is easily forgotten
- Disuse: materials is most rapidly lost after initial learning (see statistic above)
- Changed cues: the right cue is missing e.g. you studied one way but the test question is presented in another way
- Lack of attention/ effort/ concentration

See [Reasons for Forgetting](#).

### How we remember

We remember by Thinking → Encoding → Rehearsing → Retrieving. We remember in pictures. Memory is helped by:

- Organization and order
- Funnel approach: moving from general to specific
- Associations/ connections with prior knowledge
- Personal meaning - emotions
- Grouping or chunking

Long-term memory is helped by

- Repeating and reciting
- Rehearsing : reciting or repeating but in the actual place you need to remember the information
- Elaborating (deep processing) Connecting
- Teaching someone

See [Forgetting: Solutions](#).

## IV. Memory training: Basic memory strategies

### Learn and use strategies!

Clair Beaulne, a memory consultant based in Chelsea, Quebec, says that people with good memories use memory strategies. The following strategies are grouped by: associating and linking strategies, whole brain strategies, organizational strategies, and rehearsal strategies.

Source: *Tactics to improve a sluggish memory: New activities, rhyming techniques, eat well*. Canadian Press. Written by: Lisa Abel August 20, 2007.

### 1. Association & linking strategies

#### GULP!

**G-** Get it! Experience the initial learning with as many senses as possible.

**U-** Use it! Write it, repeat it, sing it.

**L-** Link it! Link it to what you know: something with personal meaning, to a location, a sound, an acronym.

**P-** Picture it! Create a visual image of the association you made. Make it bizarre, colourful, vivid.

#### Look, Snap, Connect

**Look:** Actively —observe what you want to learn. Use all five senses.

**Snap:** Visualize/Create mental snapshots of memories.

**Connect:** Link your mental snapshots together to help your recall.

See [Look, Snap, Connect](#) for more.

#### To remember names:

**Look:** make sure you really listen to and **observe** the person's name.

**Snap** a visual image of the name and the face.

**Connect** the name-snap with the face-snap.

#### Chaining a story or narrative

When you need to remember a long list of random, unassociated items, try linking them together in a bizarre, vivid, nonsensical ACTION-based story. By doing this, you will probably never forget a link in the chain! Sample story using the words from Dr. Small's objective memory test: plank, banker, sauce, umbrella, reptile, abdomen, lobster, orchestra

“On a long gangplank teeters a banker. In one hand he holds on umbrella and in the other, a jar of tomato sauce which he furiously douses on a large reptile crawling on its abdomen below him. The reptile is devouring a lobster as it makes its way up the

gangplank towards the banker. In the background an orchestra plays eerie sounds of pending doom.”

## **Pegging or loci**

Pegging takes new information and pegs (connect/ link) it to information that cannot be forgotten. Pegs are like the tabs on a file folder; they allow you to retrieve new things at a glance. You might also visualize a peg as a hook on a wall or in a closet, where you hang a jacket. This makes recalling new information easier because we have pegged it to something we already know.

What can I use pegs for? LOTS of things...

- ‘To Do’ lists
- List of unrelated words
- A sequence of events
- A sequence of numbers
- Addresses
- Directions
- Names and faces

See [Pegging & Creating Peg Lists](#) and [Pegging for Remembering Numerical Sequences & Equations](#).

## **Acronyms**

How? Use the first letter of a list to form a word, sentence, or phrase

Why? To remember lists of people, places or things; sequences, steps, formulae

E.G. HOMES = Great Lakes i.e. Huron, Ontario, Michigan, Erie, Superior

## **Acoustics**

How? Link new learning with substitute words that sound alike

Why? To remember vocabulary, foreign languages, names, dates, matching item (for a test)

E.G stalactite & stalagmite: A stalactite holds "tite" to the ceiling of a cave.

## **Songs & rhymes**

Remember how difficult it was to learn your ‘times tables’? Today some primary school teachers are using rap music to help kids remember 2x2. Not only does using music and rhymes help kids learn faster, it’s fun, too.

How? Create a rhyme, song, or poem to associate new material. Why? To remember rules, theorems

E.G. A rule: “l” before “e” except after “c” with a rap beat!

E.G. A list: “30 days has September, April, June, and November.”

### **Olfactory memory aids**

After smelling rosemary oil, students in the UK showed improved marks on a memory test. Consider associating a favourite smell with something you are trying to learn and remember.

## **2. Whole brain strategies**

### **Mind mapping**

Making a mind map is a whole brain activity, i.e., it engages both left and right hemispheres of the brain. Mind maps are both verbal (words) and non-verbal (pictures, symbols, colours). Visual patterns provide a framework for recall.

For information on creating and using mind maps, see our online resource on [Note-taking and Reading](#).

### **“Memory” music**

At University of Wisconsin, Drs. Francis Raucher and Gordon Shaw and their team of neuroscientists showed university students who listened to Mozart piano sonatas improved their spatial cognitive abilities e.g. following patterns. Other studies have shown that university students perform better on tests with background classical music instead of silence.

Even if you are skeptical of these outcomes, we know that music can enhance immune functioning, diminish pain, and elevate mood. And a better mood can sharpen mental ability.

\* Source: Small, G. 2003. *The Memory Bible: An innovative strategy for keeping your brain young*. NY: Hyperion.

See [Super Memory & Music](#).

## **3. Organizational strategies**

### **Learn from General to Specific**

Don't go for the details first; there's more chance that you will get lost. When reading, for example, firstly skim the text to get the gist. If you get the big picture, it is easier to remember the detail because you see how the detail connects to the whole.

## **Distributed practice**

Study in short sessions over a long period versus cramming for concentrated periods of time. Cramming is an ineffective way to help you remember as, you have learned, memory is added by rehearsal (e.g. reviewing, elaborating) which takes time.

See [The Distribution of Practice Effect](#).

## **Ordering/Chunking**

Decide on an order of importance and organize the material into an outline or framework. When reading, keep in mind the larger pattern of the book or journal article as you progress so you can relate subordinate ideas (e.g. details) to the larger pattern. Mind maps are a great tool for visualizing large patterns from subordinate ideas.

## **Selection**

Concentrate on the most significant information. The type of memory strategies you use might depend on the nature of the course. That is, some courses require you to focus on the big picture (e.g. themes, concepts, patterns) while others require attention and memorization of detail.

## **4. Rehearsal**

### **Reciting**

Remember that 60% of what you read is lost after the 1st hour unless...you review the material. Both verbal and written recitation of the material will stave off rapid forgetting. You may recite while you read through each paragraph or section. Recite in your own words. Rephrasing or paraphrasing shows that you really know the information.

Source: [Utah State University's Academic Resource Centre](#).

### **Reviewing & self-testing**

See our online resource [Exam Prep](#) for ideas on reviewing and self- testing.

### **Overlearning**

You can 'say it in your sleep'! Overlearning is especially important when preparing for tests and exams because it will protect you if test anxiety blocks your ability to recall what you've most recently learned.

## Teaching

When reviewing for an exam, talk to someone (e.g. use a study group), or yourself, about the topic you've been studying. When you are able to explain the information clearly and intelligently, you have really learned it.

## Sleep on it!

We do a lot of thinking while we sleep—sometimes our most creative thoughts occur during the subconscious sleep state. Freshly learned material is better remembered after sleep than after an equal period of daytime activity when interference may take place. While we sleep our minds are busy sorting, filing, and deleting information.

## Advanced memory strategies

### Remembering new or long words

e.g. Acetaminophen

Acet → a seat

amino → a minnow

phen → fin

I'm on a seat in my boat fishing with a minnow when a fin surfaces the water and steals my bait!

e.g. Spanish verb 'to bring' = traer. Think of a waiter bringing a 'tray' of food to your table.

### Remembering written passages

To learn verbatim text:

Break material into small chunks (sentence, phrase, concept, word). Read the text out loud, paying attention to the key word in each chunk. Convert the beginning of each chunk into pictures, using nonsensical action. Now either chain into a story or peg them to one of your peg lists.

Run through the pictures in your mind while repeating the passage verbatim and aloud.

For large sections, personalize it by putting yourself in the picture then pick all the key words/phrases and turn them into pictures. Again, chain them into an exaggerated story. To commit to memory, run through the pictures in your mind and repeat the passage verbatim aloud.

See [Remembering Written Passages](#).

## Remembering difficult names

For names that do not invoke an image, you need to use more advanced memory techniques. Break the name into syllables and associate each syllable with a word (preferably a noun). Then chain the **word-substitutes** together to create a visual image.

E.G. You want to remember the last name of the guy who invented this technique: Kevin Trudeau. Start by breaking his surname into 2 syllables: Tru and Deau. Now associate the syllables with substitute nouns which are easy to remember. e.g. 1st syllable sounds like 'true'.

Second syllable sounds like a doe or a female deer. So we have: True + doe.

Now chain the substitutes together:

I'm at the archery range shooting at a cardboard cut-out of a deer while a TRUE DOE laughs at me from behind a nearby tree!

### Repeat & associate

Repeat the person's name during the initial conversation. If possible, comment on how that person reminds you of someone else you know with the same name.

### See it & write it

If the person has an unusual name, ask him/her to spell it out and then visualize an image of the name spelled out.

## The Major Memory System

'The Major Memory' system is one of the most powerful memory systems available. It takes a while to master, but once learned is very powerful. It works by:

1. linking numbers to consonants
2. converting the consonants into words (ideally nouns which create vivid images) ☞
3. sequencing these images together into a storyline.

These sequences can be very complex and detailed and a large amount of information can be accurately memorized. Advanced memory is focused on numbers because numbers give more opportunities to apply memory techniques. To take advantage to this, you should have 'numbered pictures' committed to memory. These numbered pictures serve as your advanced memory vocabulary.

(For a list of 100 "numbered pictures" see Kevin Trudeau's *Mega Memory* book).

See [Major Memory System – Remembering Very Long Numbers](#).

The strategies below have been adapted from Kevin Trudeau's book *Mega Memory*.

### Remembering chemical elements

E.G. Xenon. Atomic number is 54. Atomic weight is 131.29

1. Xenon
  - a. Break info into small chunks. XEN + ON.
  - b. Turn into pictures. XEN = zen out as in chill out + ON (same)
2. Element No. 54
  - a. Use your Picture Words. If you don't have a picture word for 54, make one up.
  - b. E.G. 5 + 4 = la + ra = lure
3. Atomic Weight: 131.29
  - a. Use your Picture Words or make up one.  
131 = ta, ma, ta, tomato. 29 = na, pa, nap
4. Put it all together...
  - a. I'm trying to **zen** out **on** (Xenon) my hammock, but my friend tries to **lure** (54) me out to play. I pick up a **tomato** to hurl at her. She runs away and I go back to my **nap** (131.29).

### Remembering dates and names

E.G. 1st PM of Canada was John MacDonald, first appointed in 1867.

1. Convert numbers to consonants and then to images.
  - a. 1st: ta, toe
  - b. John A. MacDonald: john is slang for toilet and MacDonald reminds me of a BigMac.
  - c. 1867: 18 = ta, va, TV 67 = cha, ca, cheek
  - d. Noun/Images: Toe, John, BigMac, TV, cheek
2. Chain a story: I stub my **toe** and on the way to the **john** to get a bandage, I see that my sister has left her **BigMac** on top of the **TV**. Forgetting my bloody toe, I grab her food and stuff into my **cheek** as I hear her footsteps approaching...

## V. Negative effects on memory

### Lack of sleep

Sleep plays a vital role in organizing and laying down memories. So, it's not too surprising that a recent U.S. survey<sup>1</sup> discovered that students who study all night have slightly lower grades than those who sleep. Good sleep hygiene is critical to good memory so aim for a full night's sleep, especially when studying for tests and exams.

For more information about sleep, see our online resource on [Exam Prep](#) or [Prevention.com's article "Snooze it or Lose it."](#)

### Drugs & alcohol

Smoking marijuana causes short-term memory deficits which can persist for some weeks after stopping. So, if you use these drugs, think twice about smoking in the weeks before exams.

See [Marijuana & Memory](#).

Having a hangover is more than a nuisance when you need to think hard while studying, taking notes in a lecture, writing an essay, etc. Alcohol impairs judgment, slows your reaction time, and affects your sleep patterns. Alcohol is also a depressant which can negatively affect your mood.

See [Alcohol & Academics](#)

### Food & nutrition

Good nutrition is important for thinking and for memory. Toronto scientist, Dr. Carol Greenwood, conducts research on how general health and diet contribute to brain function and decline.<sup>2</sup> In her research, people who ate complex carbohydrates for breakfast (whole grain cereals and breads) got a memory boosting impact of the carbohydrate. But those who ate a simple carbohydrate, like white bread, experienced memory decline after that.

**Food & drinks that help memory:** Omega-3 fatty acids (e.g. oily fish like salmon, walnuts), and fruits and vegetables, particularly brightly coloured ones which are high in anti-oxidants. Another 'brain food' is lecithin, a phospholipid containing 'choline', a building block of one of the neurotransmitters in the brain that form thought and memory. Foods rich in lecithin are

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<sup>1</sup> Source: *Toronto Star*, "Night School a Failure." December 20, 2007. The study was conducted by Dr. Pamela Thacher and published in the January issue of *Behavioral Sleep Medicine*.

<sup>2</sup> Source: *Tactics to improve a sluggish memory: New Activities, rhyming techniques, eat well*. Canadian Press  
Written by: LISA ABEL Aug. 20, 2007

soybeans, eggs, and wheat germ. You can also buy lecithin as a supplement in the health section of most grocery stores. Drink lots of fresh water, too.

**Foods & drinks that hinder memory:** refined sugars and white flour, food with MSG and aspartame (e.g. Nutrasweet), coffee (can provide a short term memory boost, but it can make you jittery).

### **Anxiety/stress**

Worries about your academic and/or personal life can affect your ability to concentrate and, therefore, remember what you've heard, read, or observed. Stress causes your mental wheels to spin around preventing you from releasing the unconscious thought processes that get you to the highest level of information processing (i.e. Know Stage). The good news is that you can learn to manage your stress with the right mindset and useful coping strategies. Kevin Trudeau, in his bestseller *Mega Memory*, outlines an interesting eye movement technique that can reduce stress and help recall. It's easy and you can do it anywhere. Try it during your next test! If you suffer from high levels of stress, consider consulting a learning strategies or personal counsellor at Queen's [Counselling Services](#).

See [Using Eye Movements to Reduce Stress and Help Recall](#).

### **Illnesses & medications**

Some medications can negatively impact concentration and, in turn, your ability to recall. If you need to start of new course of meds which might impair your memory, especially at very busy times during the term (e.g. midterms/exams), consider making your professors aware of your situation. If you're not comfortable doing this, consult a learning strategies or personal counsellor at Queen's [Counselling Services](#). Some meds, for example those for Attention Deficit Hyperactivity Disorder, indirectly help your memory by assisting with concentration and focus.

### **Aging**

For the mature aged student reading this module, you might be wondering if your age has anything to do with ability to retain and recall information. The good news is that aging is not as big a factor in memory loss as was once thought. Recent studies have shown that we can retain our memories if we continue to 'exercise' them, i.e. practice daily activities to aid memory such as word games or learning a foreign language.

# TOOLS FOR IMPROVING YOUR MEMORY

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## Subjective Memory Questionnaire

Overall memory	Poor		Good			Excellent	
How would you rate your memory overall?	1	2	3	4	5	6	7

How often do these present a problem for you?	Always		Sometimes			Never	
Names	1	2	3	4	5	6	7
Faces	1	2	3	4	5	6	7
Appointments	1	2	3	4	5	6	7
Where I put things (e.g. keys)	1	2	3	4	5	6	7
Performing household chores	1	2	3	4	5	6	7
Directions to places	1	2	3	4	5	6	7
Phone numbers I have just checked	1	2	3	4	5	6	7
Phone numbers I use frequently	1	2	3	4	5	6	7
Things people tell me	1	2	3	4	5	6	7
Keeping up correspondence	1	2	3	4	5	6	7
Personal dates (e.g. birthdays)	1	2	3	4	5	6	7
Words	1	2	3	4	5	6	7
Forgetting what I wanted to buy at the store	1	2	3	4	5	6	7
Taking a test	1	2	3	4	5	6	7
Beginning something and forgetting what I was doing	1	2	3	4	5	6	7
Losing my train of thought in conversation	1	2	3	4	5	6	7
Losing my train of thought in public speaking	1	2	3	4	5	6	7
Knowing whether I have already told someone something	1	2	3	4	5	6	7
As you read a novel, how often do you have trouble remembering what you read?	Always		Sometimes			Never	
In opening chapters, once I've finished the book	1	2	3	4	5	6	7
Three or four chapters before the one I'm now reading	1	2	3	4	5	6	7

<b>How often do these present a problem for you?</b>	<b>Always</b>		<b>Sometimes</b>			<b>Never</b>	
Chapter before the one I'm now reading	1	2	3	4	5	6	7
Paragraph just before the one I'm now reading	1	2	3	4	5	6	7
Sentence just before the one I'm now reading	1	2	3	4	5	6	7
<b>How well do you remember things that occurred ...</b>	<b>Poorly</b>		<b>Fair</b>			<b>Well</b>	
Last month	1	2	3	4	5	6	7
Between 6 months to 1 year ago	1	2	3	4	5	6	7
Between 1-5 years ago	1	2	3	4	5	6	7
Between 6-10 years ago	1	2	3	4	5	6	7
<b>When you read a newspaper or magazine, how often do you have trouble remembering what you read?</b>	<b>Always</b>		<b>Sometimes</b>			<b>Never</b>	
In the opening paragraphs, once I have finished the article	1	2	3	4	5	6	7
3-4 paragraphs before the one I am currently reading	1	2	3	4	5	6	7
The paragraph before the one I am currently reading	1	2	3	4	5	6	7
3-4 sentences before the one I am currently reading	1	2	3	4	5	6	7
The sentence before the one I am currently reading	1	2	3	4	5	6	7

**Scoring: Add up all the numbers you have circled.**

**200+** = minimal subjective memory difficulties. Move onto advanced memory skills training.

**100-200** = you are noticing a moderate degree of memory challenge. Spend more time on developing basic memory skills before moving to the advanced memory skills training.

**Below 100** = you have a greater self-awareness of memory difficulties. It would suggest that memory training will be a greater challenge, so it's important to take your time. You might also consider contacting a health care professional or expert about your concerns.

## Objective Memory Test

This test assesses your current learning & recall abilities. Instructions:

1. Study the following words for up to 1 minute.
2. Do not write anything down.
3. Recall them after a 20-minute break.

Plank

Banker

Sauce

Umbrella

Abdomen

Reptile

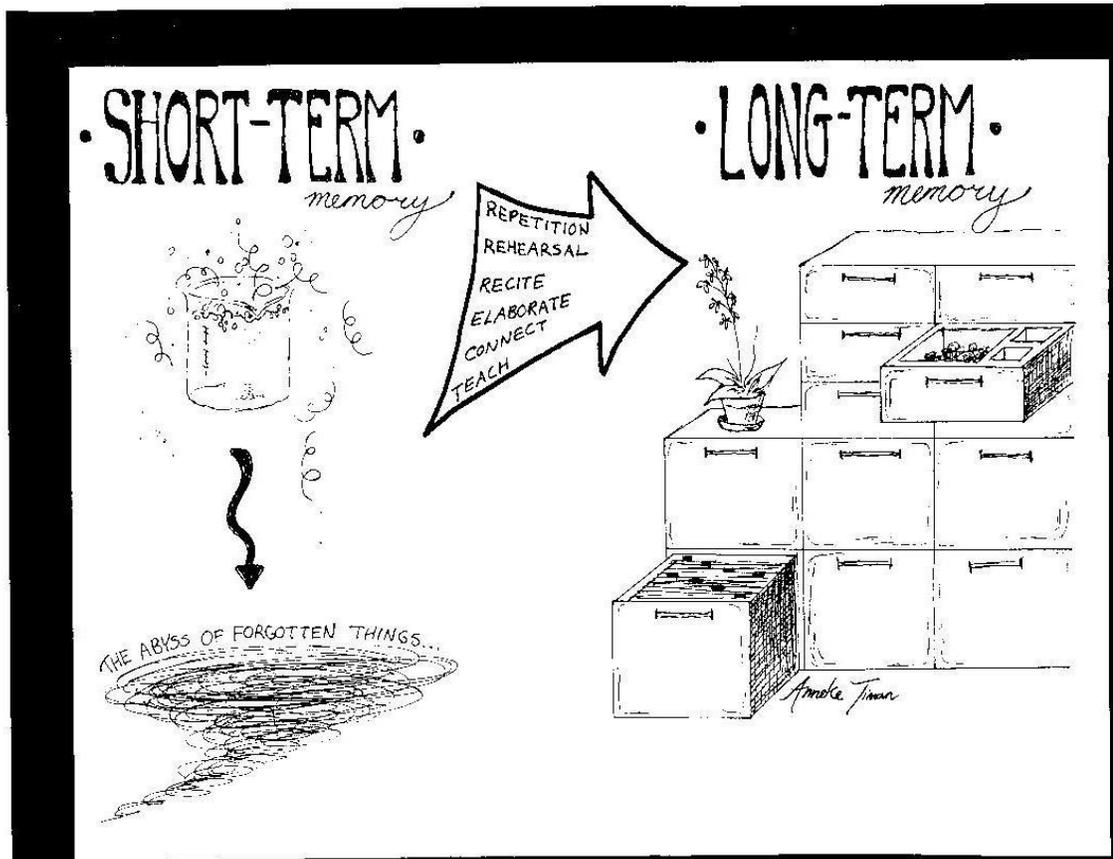
Lobster

Forehead

Orchestra

Jury

## The filing cabinet of your mind



Created by Anneke Timan, Physics student, Queen's University, 2007

## Reasons for forgetting

### Negative self-concept

The people who are convinced that they cannot remember are most apt to forget. You must have confidence in your own abilities.

### Underlearning

When material is not learned well enough, it will be easily forgotten. If something is to be retained, it must be correctly learned first.

### Disuse

Forgetting through disuse is both normal and unavoidable. Material is most rapidly lost upon initial learning. To retain material requires ongoing review and application.

### Interference

New material tends to interfere with old materials. In other words, what you are currently learning may cause some forgetting of previously learned material. This is particularly true if the material is similar. The greater the similarity between present versus past learning, the greater chance there is for forgetting, confusion, and inaccurate learning. Mental overcrowding can prohibit learning. It is difficult to learn one subject if your mind is on a number of other things. For example, it would be difficult to learn your history chapter if you are watching TV, thinking about other course, or worrying about personal problems. Also, continuous study without a break (reading one book after another), may cause fatigue and boredom, thereby reducing the ability to concentrate.

### Changed cues

You may have all of the information you need stored away in your mind but be unable to recall it if the right cue is missing. In other words, if you study the material one way and the test question is presented in another manner, you may be unable to remember. It is important that you put the material you are studying in your own words to make sure you understand it, thus improving your ability to recall the material.

### Lack of attention and effort

The art of memory is the art of attention-attending to the material wholly. Moreover, there must be effort and intent to remember. The possibility of forgetting the material, because of any of the previously mentioned reasons, will be greatly reduced.

Source: [Utah State University Academic Resource Centre](http://sass.queensu.ca/learningstrategies).

## Forgetting: Solutions

### Solutions to use before a test

**Overlearn:** Get to the point where you can say it "in your sleep". **Why?** During an exam, anxiety increases. Anxiety can block the ability to recall what has been recently learned. Recalling what we have "overlearned" is much easier task and may be accomplished even when anxious.

**Review daily:** At least 10 to 15 minutes each day go over notes from class. Carry study note card with you always; study them whenever you have the chance - like when you are waiting for a friend or standing in line. **Why?** It is practice for the test. After learning the material, you essentially "forget" it while doing other activities. By reviewing, you go through the process of activating and retrieving that idea. This strengthens the "pathway" to the ideas. Each time you "forget" and "retrieve," you reinforce the pathway. Daily reviews work to promote recall.

**Say it out loud:** Don't become content just to read or listen to the material. Talk about the material. Bore your roommate or explain it to a study buddy. **Why?** A new and different memory of the material is constructed for each different method - seeing, hearing, saying, etc. The more memories, the better the chance of finding the information again in memory.

**Draw a picture or diagram:** Make an outline, create an image or associate a technical word with its meaning. **Why?** When you translate ideas into diagrams, outlines, matrixes, or other formats, you decide what information to select and how to represent it. You remember decisions better than seeing and saying. You can more easily recall memories about decisions.

**Make up practice tests:** As you review your notes, write test questions down on 3x5 cards with answers on the back. **Why?** Same idea as #4. You decide on the question, how to phrase the answer, what answer was. On a test, you can use memory of decisions to construct an answer.

**Construct connections between ideas:** Don't "pigeonhole." Try to see the big picture. Take some concentrated study time to think about the "web" of knowledge. **Why?** It is easier to recall main ideas. If we have make connections, we can recall main ideas and then recall or reconstruct details. We forget unconnected ideas quite easily.

**Flag cue words:** Circle words in practice questions that cue the answer. Write synonyms for the circled words. Go backwards when you study - from answer (response) to a question (cue).

**Why?** Test question are often worded differently than practice questions. With one cue, we have only one entrance to the memory. If we have practiced recalling using several cues, we increase our chances of answering.

Source: [Utah State University Academic Resource Centre](http://sass.queensu.ca/learningstrategies).

## Look, Snap, Connect

### Look

**Actively “observe” what you want to learn. Use all five senses.**

**ACTIVITY:** Choose a favourite object. Study it carefully for several minutes. Pay attention to all its nuances and details. What are its colour, textures, shapes, and size? How does it smell, taste, sound, and feel?

### Snap

**Visualize/Create mental snapshots of memories**

Use imagined snapshots: bright, colourful, enhanced, moving, 3D snapshots stick best in memory. In addition, exaggerating and distorting one or more aspects of your snaps can help recall. E.G. You parked your car on level 2B.

**ACTIVITY:** Go back to your favourite object. Visualize it from memory. You are now creating a mental snapshot of the information. Snapshots can be real or imagined.

### Connect

**Link your mental snapshots together to help your recall.**

You can MERGE, ROTATE, DANCE, WRAP, OVERLAY, CRASH, etc the images together.

**ACTIVITY:** You need to buy a birthday cake for your romantic partner.

1. Personalize: your partner likes to play baseball.
2. Connect: Match task in an exaggerated, nonsensical way.

e.g. Imagine your partner is playing ball with a bat made of cake. They hit the ball with the cake bat and the cake goes flying everywhere!

## Pegging and creating lists

Pegs are like the TABS on a file folder; they allow you to retrieve new things at a glance. You might also visualize a peg as a HOOK on a wall or in a closet, where you hang a jacket.

Pegging takes new information and pegs (connects) it to information you know well. This makes recalling new information easier because it is related to something we already know. Simply put... **Take something you 'know' (the peg) and put it together with some new information.**

### How do I use pegs?

1. **Create your pegs.** Choose something simple and familiar: rooms of your house, etc.

The Body List (as described in *Mega Memory*)

- Toes = 1
- Knees = 2
- Muscle = 3
- Rear = 4
- Love handles = 5
- Shoulders = 6
- Collar = 7
- Face = 8
- Point = 9
- Ceiling = 10

\**Mega Memory* author, Kevin Trudeau, chose these words to correspond with consonant sounds in the English language. He has done this so you can peg complex vocabulary, an advanced memory skill.

2. **Memorize your peg list.** Stand up. Touch the body part and say it out loud: Number 1, toes. Number 2, knees, etc. Continue doing this until the list is memorized. It must be committed to memory before pegging. These 10 body parts are now PEGS.
3. **Create a vivid image of the new information.** E.G. You need to remember to hand in an assignment at 4 pm. Imagine the colour, shape, size of your assignment. Imagine a huge clock reading 4 pm.
4. **Connect the peg image to the new information image IN A VIVID, NONSENSICAL WAY.**

Toes (peg) & Assignment (new info): Imagine kicking your assignment all the way from your house to the prof's mailbox. Knees (peg) & 4 pm (new info): Imagine a huge clock strapped to your knees with the number 4 on the dial.

## Pegging for remembering numerical sequences and equations

Many students need to remember sequences of number and formulae. Pegging can help.

### How to peg numbers

1. Memorize 10 simple, specific visual images, one for each of the 10 digits.
2. Create a picture for the equation. Here's a simple one using the Body List from above:

$$2 \times 4 = 8$$

2=knees

4=rear

8=face

3. Use the pegs to create a story: "I am walking along the street and all of a sudden my knees begin to tickle. I look down and notice a big pick mosquito buzzing around my knees ready to strike. I swat it away and what does he do? He lands on my rear. I swat it away and he goes to my face. I slap my face, but I miss and he goes back to my knees. We keep chasing each other till my knees, rear, and face burn from slapping myself."

For numbers beyond 10, create more pegs! Either expand your present list or create an entire new list. e.g. The Reach List is all the stuff you can easily reach on your desk: pen, stapler, highlighter, paper clips, tape, phone, lamp, in-tray, etc.

With a trained memory, it takes about 30 seconds to create these pictures and commit them to memory. Obviously, if you're just starting out, you won't be at this level immediately.

### Try it yourself!

Peg your social insurance number or another sequence of numbers you use regularly. Did it help?

Sources:

Small, G. 2003. *The Memory Bible: An innovative strategy for keeping your brain young*. NY: Hyperion.

Trudeau, K. 1997. *Mega Memory: How to release your superpower memory in 30 minutes or less a day*. NY: HarperCollins.

## Super memory and music

### Which music contains the sounds of smartness & mental activity?

Ultra high-frequency waves; classical music with logic symmetry and aesthetic.

### Types of music used for fast, factual learning:

Baroque 17th & 18th century concertos by masters like Bach, Vivaldi, Corelli.

If you like music from the East...Sitar from India and the 'Koto'/Japanese harp. Soothing, serene music at the all-important 60 beats per minute – the 'beat of memory.' Musical keys sequenced in ascending order for increased health benefits.

### The Mozart Effect

Mozart's music is exceptionally rich in brain-energizing sounds. US research showed that listening to Mozart improves spatial cognitive skills e.g. following patterns; helps to temporarily organize thinking; improves mood which decreases stress.

Listening for ten minutes before a test boosted IQ scores sharply.

Much earlier another MD, Georgi Lozanov, working in Bulgaria, uncovered the same exciting discovery – high-frequency music like Mozart's enhances mind/memory, vitality and motivation. He incorporated this music into the world's first accelerated learning method.

Sources:

Ostrander, S. & Schroeder, L. (1997). *Superlearning 2000: New Triple Fast Ways You Can Learn, Earn, and Succeed in the 21st Century*. NY: Dell.

Small, G. (2002). *The Memory Bible: An Innovative Strategy for Keeping Your Brain Young*. NY: Hyperion.

## The distribution of practice effect

Research has shown that memory is improved by:

### 1. Spacing

Time taken to learn something is significantly less if the learning is spaced out. e.g. A task taking 30 minutes, if learned all in one day, will typically take 22 minutes if spaced over 2 days. A 30% time saving!

Recall is enhanced if there is a short space between presentations of the same material.

### 2. Immediate Rehearsal

If you test yourself and succeed in recalling the correct answer, your memory for those facts will be considerably strengthened compared with merely having the information given to you.

### Try out this strategy

- a. Say the new information out loud.
- b. Self-test or rehearse immediately (i.e. within the span of the short-term memory).
- c. Leave this item and go to the next item—learn and rehearse this new item. This gives you a short break (spaced practice) from the first item.
- d. Go back to the first item again. Rehearse again.

Source: Rose, C. (1985). *Accelerated Learning*. NY: Dell Publishing

## The Major System: Remembering very long numbers

**Step 1:** Learn the Body List pegs. Each body list peg begins with a different English consonant. Then learn the consonant sounds represented in the body peg.

H and W are missing because they belong to a different class of sounds.

Pegs	Consonant sounds
1. Toe	T, d, th
2. Knees	N
3. Muscles	M
4. Rear	R
5. Love handles	L
6. Shoulders	Sh, ch, j, dg/dz
7. Collar	C (hard c), g, ng
8. Face	F, v
9. Point	P, b
10. Ceiling	S, z, c (soft c)

**Step 2.** Take a 2-digit number you need to remember and create a word (preferably a noun or an action word) from the consonants.

E.G. The number I need to remember is: 050923

- 05 → s/z + l = sill, zeal, soul, sell, sole
- 09 → s/z + p/b = zap, zip, sip, sap
- 23 → n + m = name, numb

3-digit numbers are also possible. E.G. 400 r + c + c = races

**Step 3.** Take the words and chain them into a sentence or story. Make the sentence as animated, crazy, colourful as possible to help make the memory enjoyable so you can remember better.

05 zeal → 09 sip → 23 numb = **With great zeal, I sip very hot tea and my tongue goes completely numb.**

You can memorize these memory words, or create new ones as you go. However, it is faster if you have a bank of some words memorized, e.g., words representing 1-20 (?)

**Now try a really long number...**e.g. Pi to 11 decimals: 3.141 59 26 53 59. Try to use nouns whenever you can. Verbs are more difficult as they require tense. However, with a 3 digit word verbs can work well e.g. 141 = dared (past tense).

- 141 → t/d + r + t/d = dared/dart/tarred
- 59 → l + p/b = loop/lop/lip/leap
- 26 → n + sh/j/dg = nudge/knock
- 53 → l + m = lamb/limb/llama/lama
- 59 → l + p/b = loop/ lob/lip/leap/lobe/lube

Using the major system and chaining a story together, I can remember Pi as: **While I dared to leap into the air, I nudge the llama which I am trying to loop with a rope.**

## Remembering written passages

To learn verbatim text:

e.g. You need to learn the lyrics to the Canadian national anthem, “Oh Canada”.

“O Canada, our home and native land. True patriot love in all thy sons command. With glowing hearts we see thee rise, the True North strong and free. From far and wide, O Canada, we stand on guard for thee...”

1. Chunk the line
  - a. (O Canada) our home and native land
  - b. true patriot love (in all thy sons command)
  - c. glowing hearts (we see thee rise)
  - d. True North (strong and free)
  - e. far and wide (O Canada)
  - f. stand on guard (for thee)
  
2. Convert key words/phrases of each chunk into vivid pictures.  
For example, for chunk a), imagine the picture of a ‘home’ and ‘land’. For chunk b), imagine a true or false quiz for “true”, a heart for “love,” a boy for “thy sons,” etc.
  
3. Now you can either chain them together or peg them to one of your Peg List.
  
4. Repeat the passage out loud verbatim while you go through your story or peg list.

Source: Trudeau, K. 2001. *Mega Memory: How to release your superpower memory in 30 minutes or less a day*. NY: HarperCollins. 310-311.

## **Marijuana and memory**

This is a good article explaining that short-term memory deficits can persist for some weeks after stopping marijuana. So, it's a good idea not to smoke in the weeks before exams.

"It definitely fogs your brain," says Lambros Messinis of the University Hospital of Patras in Greece, on the effects of marijuana. That, of course, is why people smoke it in the first place. What Messinis claims, however, is that it has a more serious effect: he says that long-term users gradually become worse at learning and remembering things.

Messinis and his colleagues compared the mental abilities of 20 people who had smoked dope at least four times weekly for an average of 15 years with 20 shorter-term users averaging 7 years of use, and 24 controls. None of the subjects had smoked for at least 24 hours before the test, and Messinis used a standard psychological method to control for differences in intelligence before they started using marijuana.

The veteran users performed worst in memory tests: asked to recall lists of 15 words they had seen earlier, for example, they averaged seven, compared with nine for the shorter-term users and 12 for the controls.

*(Neurology, vol 66, p 737).*

Excerpts taken from [Blackwell-Synergy.com](http://www.blackwell-synergy.com).

## **Does alcohol have an effect on academics? YES!**

On average, students who drink the most alcohol receive the lowest grades:

- D and F students average 9.5 drinks per week
- C students average 5.6 drinks per week
- B students average 4.4 drinks per week
- A students average 3.1 drinks per week

Alcohol is estimated to be the cause of 40% of major academic deficiencies and nearly 30% of all dropouts. Why?

- People who are out late partying often over-sleep and miss classes
- Someone who is hung over is more likely to sleep in, or is too sick to attend class
- People who party several times a week can fall behind on homework, projects or papers

Evidence suggests that alcohol can also affect some of the brain functions that affect learning.

### **Memory foundation**

The ability to form new memories. A chronic drinker may be able to recall something from their childhood, but may not be able to remember what they ate for lunch a few hours ago. On mental ability tests, chronic drinkers often perform poorly on retention skills.

### **Abstract thinking**

One of the major tasks of the brain is to distinguish the difference between concrete, obvious and surface reasoning and abstract thinking such as word puzzles and interpreting stories. Abstract thinking is more difficult for chronic drinkers.

### **Problem-solving**

Problem solving often involves using different strategies and reasoning skills. We also need mental flexibility, the ability to switch strategies and approaches to problems in order to solve them. Often under testing, heavy drinkers find themselves taking a lot longer to find solutions because they get stuck in one particular method of problem solving.

### **Attention and concentration**

There is some evidence that chronic drinkers have a hard time keeping their attention focused and maintaining their concentration. The degree to which these functions are affected depends on how much alcohol is consumed. Chronic long-term abusers of alcohol experience the major effects. However, social drinkers also develop deficits in their mental functioning. The more alcohol a person has when they go out, the more likely the negative effects will develop.

Sourced from: [The Bacchus Network](#)

## Using eye movements to reduce stress and improve recall

When a person is retelling a personal story, a lot of emotions arise. If you look closely at the person's eye movements, you will notice that s/he is periodically looking upwards. This involuntary action functions to reduce the stress associated by these emotions. When the stress is reduced, the mind can open up to more unconscious memory work (see Kevin Trudeau's 5 Stages of Information Processing).

### Activity

Here's the quickest way to relax and get out of the thinking stage:

1. Relax and take a breath.
2. Look up to the right and hold for a few seconds.
3. Look up to the left and hold for a few seconds.
4. Continue back and forth for a few

Trudeau, K. (1997). *Mega Memory: How to release your superpower memory in 30 minutes or less a day*. NY: HarperCollins.