

Learn the Art of Memory

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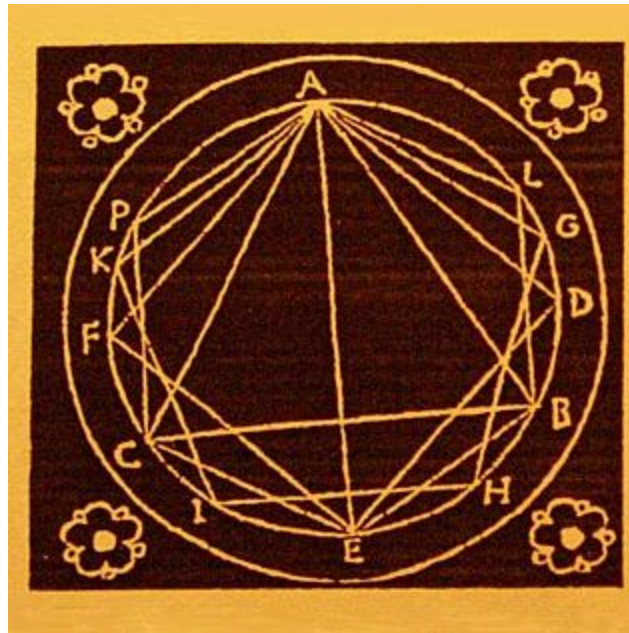


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INTRODUCTION

This ebook is designed to give you a quick introduction to memory techniques that you can build upon. The techniques are the same ones that we practice and teach on [Art of Memory](#) and [Memory League](#).

STORIES AND LINKS

The human mind has a natural ability to remember stories. We are also able to easily link things that we don't know with things that we already know. This is one of the fundamental principles of the Art of Memory.

It becomes easier to remember unfamiliar information when we can link that information to something that we already know.

Here is a simple exercise that demonstrates how linking concepts together makes them memorable. I will give a list of word pairs. Try to picture the words as visual images and have them interact with each other.

So the first pair will consist of **fireplace** and **apple**. Imagine a fireplace and an apple, and link them together in your mind. For example: imagine roasting an apple in a fireplace. Strange images are memorable.



The second pair of words is composed of **bowl** and **computer**. You could imagine eating a bowl of food at your computer and spilling the food on your keyboard. Take a moment to picture that image.

The third pair of words is **flower** and **rhinoceros**. Picture a rhinoceros charging into a giant flower, or maybe just wearing the flower behind its ear. You can exaggerate the associations to make them memorable.

Here is the complete list of word pairs for you to practice linking:

- fireplace – apple
- bowl – computer
- flower – rhinoceros
- money – library
- book – toothbrush
- lizard – pyramid
- fish – clown

Take a moment to review them, and then turn to the next page.

Here is the list again, but with one word in each pair missing. Can you remember the missing word for each pair? Give it a try before continuing.

fireplace	
bowl	
flower	
money	
book	
lizard	
fish	

If you are having trouble recalling the missing words, ask yourself, "what was happening in the fireplace?" or "what was the fish doing?" (Biting a clown's nose?)

Don't worry if you don't get all of them on your first try. Go back to the original list of pairs, and try linking them together again. All of this will become much quicker and easier with some practice.

ALPHABET PEGS

We've learned a way to link image pairs together. We can now expand on this technique to remember long lists of things in order.

The way it works is that we take an ordered list *that we are already familiar with*, like the alphabet or a sequence of numbers, and turn the list items into concrete things that we can visualize.

Let's start with an example that uses the alphabet.

The English alphabet is a list of 26 letters that most people know how to recite in order: A, B, C, D, etc. We can turn each letter into a picture, and then associate something with each picture. We can then recite the alphabet back in order and recall the associations that we memorized. This will give us the ability to remember lists that are at least 26 items long.

Let's start with a list of 26 alphabet animals. You can change the animal names if you prefer to use different animals.

1. A = ant
2. B = bee
3. C = cat
4. D = dog
5. E = elephant
6. F = frog
7. G = giraffe
8. H = hippopotamus
9. I = iguana
10. J = jellyfish
11. K = kangaroo
12. L = lion
13. M = mouse
14. N = narwhal
15. O = owl
16. P = penguin
17. Q = quail
18. R = rabbit
19. S = snake
20. T = turtle
21. U = unicorn
22. V = vulture
23. W = woodpecker

24. X = [x-ray fish](#)

25. Y = yak

26. Z = zebra

Now if you want to remember a list of things, you can associate each alphabet animal with each item in your list.

Let's assume that you are memorizing a list of people to email:

1. John
2. Sara
3. Bob
4. Nancy
5. Jim
6. Laura
7. Etc.

You would take each animal peg and picture the animal interacting with that person. You can use exaggeration here to make the images memorable.

1. John is riding a giant ant (A).
2. Sara is getting stung by a bee (B).
3. A cat (C) is sitting on Bob's head.
4. Nancy is walking a dog (D).
5. Jim is picking up an elephant (E).
6. Laura is kissing a frog (F).
7. Etc.

Now to recall the items in order, just walk through the alphabet. The first letter is A, which is an ant. Try to recall what the ant was doing, and you should see a giant ant being ridden like a horse by John. To recall the next item, go to the next letter in the alphabet, B, find the associated animal, a bee, and think about what the bee was doing. You can continue to go through the alphabet animals until you have recalled all of the items.

If you can [recite the alphabet backwards](#), you can also recite the memorized list items backwards.

You can create more than one alphabet peg list, by using different animals, objects, foods, names of celebrities, and more. See the [alphabet peg list](#) guide for more information.

THE METHOD OF LOCI

One of the most important techniques of advanced mnemonics is the method of loci. With this technique one creates imaginary journeys in the mind where one deposits mnemonic images that represent the facts to be remembered. These journeys are often referred to as memory palaces, mind palaces, or memory journeys.

According to the Romans, the [method of loci](#) was invented somewhere around 2,500 years ago by a Greek poet named [Simonides of Ceos](#) though the technique is actually much older and goes far back into hunter-gatherer times.

How It Works

To create a memory journey (sometimes called a memory palace, though a memory palace is just one kind of memory journey), you take a place that you know well and create specific locations.

Start by finding a room that you know well, for example, your bedroom.

We'll use the photograph below as an example.



Image of bedroom is copyright [Mojmir Churavy](#) and used under a [CC BY-SA 4.0 license](#).

After you have chosen a room for your memory journey, create an imaginary journey between fixed locations in the room. In this example, we'll choose four locations. In general, I like to go from left-to-right and top-to-bottom, where possible.

The four locations in our memory journey are:

1. Table
2. Closet
3. Left side of the bed
4. Right side of the bed



Imagine that we have a list of things to memorize. This might seem like a strange list of things to memorize, but we'll explain the reason for choosing these objects a bit later.

1. Otter
2. Toolbox
3. Beans
4. Shell

Imagine each item in the list occupying one location in your memory journey.

Location	Thing to memorize
Table	Otter
Closet	Toolbox
Left side of bed	Beans
Right side of bed	Shell



After you have placed the items in your memory journey, review it a few times by closing your eyes and mentally walking through the locations in order, trying to recall the objects that are contained there.

Before you go to sleep, walk through the memory journey once again.

You should be able to recall the items in order, forwards and backwards, the next day and into the future.¹

For large memorization projects, your memory journeys/palaces can contain hundreds of locations (or more), but the basic technique is the same.

Take a few moments to try memorizing the otter, toolbox, beans, and shell, because we'll use them again later.

Memory journeys are particularly good for remembering ordered lists:

- shopping lists
- vocabulary lists (when the order matters)
- to-do lists
- study notes
- long numbers
- history timelines
- the periodic table of elements
- and much more!

¹ If you're having difficulty with the technique, post in the [Art of Memory Forum](#), and we'll help you get it working!

NAMES AND FACES

A basic way to memorize names is to use association between some feature on the person and their name. For example, to memorize that this man's name is Jamal, you could imagine **jam all** over his hair.



To memorize that this woman's name is Teresa, imagine **trees** growing out of her glasses.

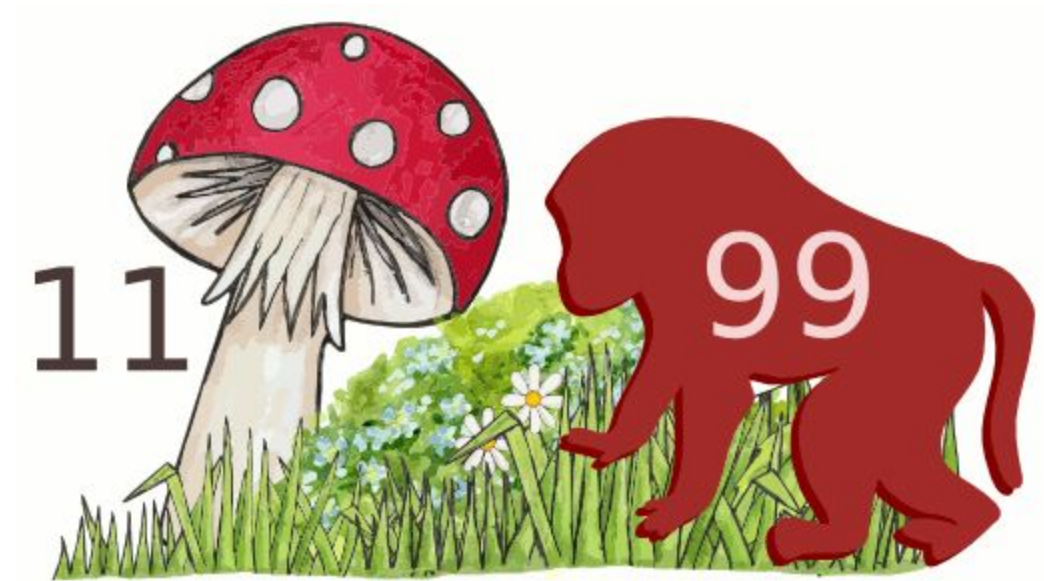


The wiki has a comprehensive page on [how to memorize names and faces](#). You can also practice memorizing names with the [Memory League app](#).

MEMORIZING NUMBERS

Just as with basic association techniques, memorizing numbers involves taking things that are difficult to memorize (numbers) and associating them with things that are easy to picture in your mind.

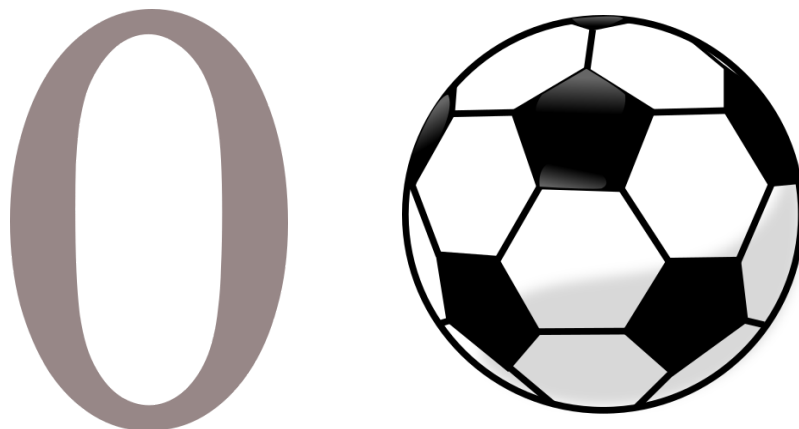
Most number memorization systems rely on turning each number into a picture. We will start with the easiest methods and work up to more advanced methods.



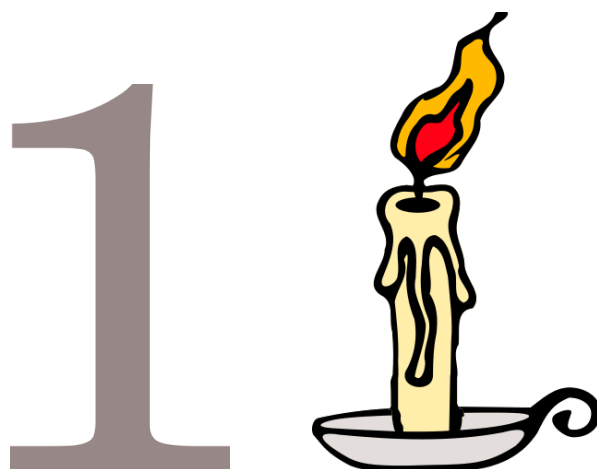
Number Shapes

The **number shape system** is a simple way to remember numbers that goes back at least hundreds of years.

Each digit is linked with an object or animal that looks like that number. For example the digit 0 looks like a ball or an egg.



The digit 1 looks kind of like a candle.



Here is a list of ideas:

0 **looks like:** a ball, egg, doughnut, or ring

1 **looks like:** a candle, stick, or spear

2 **looks like:** a swan

3 **looks like:** a butterfly, handcuffs, or heart

4 **looks like:** a flag or sailboat

5 looks like: a hook, snake, Superman, or seahorse

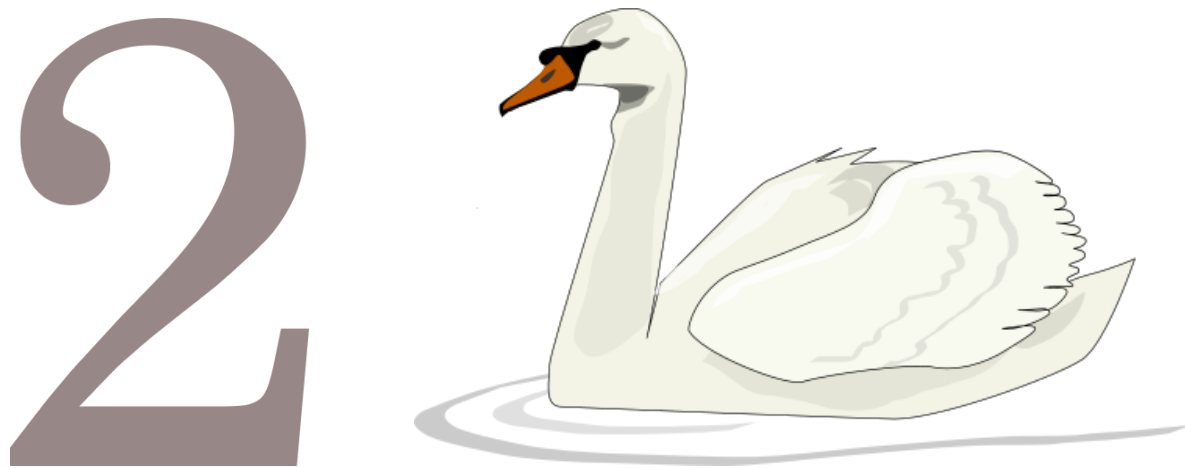
6 looks like: a cherry, elephant's trunk, golf club, or combination lock

7 looks like: a boomerang or axe

8 looks like: a snowman or hourglass

9 looks like: a balloon on a string

Here's a practical example of using this simple number-shape system: if you have a doctor appointment at 2 PM and don't want to forget the time, you can convert the number 2 into a visual image that looks like a "2". A common mnemonic image for 2 is a swan.



You can then picture a swan in your doctor's office. When you think about the doctor's office, you will remember "seeing" the swan there, and you can translate the swan image back into the number 2.

The number shape system is one of the more basic number memorization techniques. It's used for remembering short numbers. For memorizing longer numbers, there are more powerful number systems, like the Major System, described below.

The wiki has more information and a video about [number shape systems](#).

Number Rhymes

The **number rhymes system** is another way of linking numbers with images, but instead of using the shape of the number, you create rhymes. Here are some examples:

0 = hero

1 = bun, sun, or gun

2 = shoe or gnu

3 = tree or sea

4 = door

5 = hive

6 = sticks

7 = heaven (you could use an image of an angel to distinguish it from a gate)

8 = bait (fishing) or gate

9 = wine, line, or mine

The wiki has more information about [number rhyme systems](#).

Both number shapes and number rhymes are very simple. They are not suitable for memorizing really long numbers. For that you will need a dedicated system of 100 mnemonic images -- one for each 2-digit number between 00 and 99. We'll explain how to do that below.

Number Pegs

Numbers can be used for [creating peg lists](#), just like the alphabet. You could even use your Major System images (explained below) as pegs. Anytime that you have a list in your mind that you can keep in order (like the alphabet), you can use it as a peg list.

Larger Number Systems

Bigger number memorization tasks require larger mnemonic systems. A few are explained below.

Most memorizers create mnemonic images for every digit from 00 to 99 (100 images). Many competitive memorizers create images from 000 to 999 (1,000 images), or even 0000-9999 (10,000 images) in at least [one case](#).

We'll explain how to create your 100 images from 00 to 99. Creating this system will give you the tools to memorize numbers of any length -- from phone numbers, credit cards, and history dates, up to tens of thousands of digits of pi!

Association System

One way to link numbers to images is to find associations between them.

For example, the number 52 could be represented by a deck of playing cards, because a deck has 52 cards.

The number 00 could be represented by a bicycle, because it looks like the wheels of a bicycle.

The number 64 could be represented by the Beatles, because of their song, *When I'm Sixty-four*.

In general, every memorizer chooses their own images, because everyone has different associations.

The association technique has been proposed by three-time World Memory Champion, [Andi Bell](#). You can find a full [example set of 100 images](#) in the wiki.

Major System

The **Major System** is probably the most common number-memorization system in use. Though the history of the Major System [goes back at least hundreds of years](#), its first publication in its modern form appears to have been written by [Aimé Paris](#) in 1825.

In the version of the Major System that we'll describe here, every possible two-digit number will be converted into an image by translating the digits into consonant sounds and then finding an image that fits those consonants.

The code for translating digits to consonants is:

Digit	Consonants	Explanation
0	z or s	"Zero" starts with a z. The letter, s, is almost the same consonant as a z, but it doesn't use your vocal chords.
1	t or d	1 looks like a t. The letter d is like a t that uses your vocal chords.
2	n	The letter n has 2 vertical lines. Also, if you turn the number 2 on its side (and flip it), it looks kind of like an n.
3	m	The letter m has 3 vertical lines. Also, if you turn the number 3 on its side, it looks like an m.
4	r	"Four" ends with an r. 4 also resembles a backwards R.
5	L	If you hold out your left hand with the palm away from you and the thumb extended, your thumb and index finger make an L shape. There are 5 fingers on your hand.
6	ch, sh, j, zh	<p>The sounds are:</p> <ul style="list-style-type: none"> • ch as in church • j as in Juliet • sh as in shell • zh as in Jacques <p>When you pronounce them, notice how the mouth position is the same between ch and j, and also between sh and zh. The differences are that two of the consonants use vocal chords (j, zh) and two do not (ch, sh).</p>
7	k or g	7 is angular like the letter k. The consonant g is the one found in grape , not George . It's a voiced relative of k.
8	f or v	8 looks like a cursive f. The consonant v is a voiced k.
9	p or b	9 looks like a backwards P. The letter b is a voiced p.

To create an image from a two-digit number, convert each digit into a consonant using the table above. Then find a word that uses those two consonants as their first two consonants. Double letters that have one sound are counted as one consonant. So the word "llama" would be 53 (**LLaMa**), not 55.

Here are some examples:

Number	Digit #1	Digit #2	Image
07	0 → s/z	7 → k/g	i Ce C ubes ²
11	1 → t/d	1 → t/d	T oa D stool
20	2 → n	0 → s/z	ei N Stein
99	9 → p/b	9 → p/b	Ba B oon

You have already memorized eight digits of pi when you placed the otter, toolbox, beans, and shell in your memory palace. Each of those images represents a two-digit number:

Number	Digit #1	Digit #2	Image
14	1 → t/d	4 → r	o T Te R
15	1 → t/d	5 → L	T oo L box
92	9 → p/b	2 → n	B ea N s
65	6 → sh/ch/zh/j	5 → L	S He L L

The first digits of pi are: 3.14159265. You can use this combination of the Major System and the Method of Loci to memorize tens of thousands of digits of pi. We also have a page in the wiki about the [Major System](#) that contains additional tips and [Major System examples](#).

Other Systems

If you're interested in advanced number memorization systems, you might be interested in reading about the [Dominic System](#), the [Ben System](#), and [binary number memorization systems](#). We have a [video that provides an overview](#).

You can practice memorizing numbers with [Memory League](#) and our other [memory training software](#).

² Remember that the *consonants* of the Major System are not *letters*. The consonant sound "k" can be represented by the letters: c ("c**a**t"), k ("p**a**r**k**"), ck ("b**a**ck"), or even ch ("P**a**ch**e**lbel"). So even though the word "cubes" starts with a c, it maps to 7, because the consonant sound is like a k. However, the first c is an s sound, so it maps to 0. In a similar way, the ph in "philosopher" is translated into a 8 (f/v), because the *sound* of ph is "f".

MEMORIZING CARDS

Memorizing card is similar to memorizing numbers. You can reuse your Major System images for cards.

The basic concept is that each of the 52 cards is assigned a fixed image. Those images get placed in order in a memory journey. To recall the order, mentally walk through your memory journey and translate the images back into cards.

There are several systems for translating cards into images, and we'll introduce a couple of simple ones here.

Suit Categories Method

One way to translate cards into images is to create categories based on the suits.

For example:

Suit	Category	Examples
Spades	Tools	You can use the Major System to convert the card values to letters, and then choose a tool that begins with that letter. Example: 4 is r in the Major System, so the 4 of spades could be a <i>rope</i> .
Hearts	Love	This could include family, close friends, and anything else associated with love. Example: the 8 of Hearts could be the goddess Venus, because 8 is an f or v in the Major System, and Venus starts with a v.
Diamonds	Money	People or objects associated with wealth. Example: the King of Diamonds could be Warren Buffett or Bill Gates.
Clubs	War	People or objects associated with war or aggression. Example: the King of Clubs could be Henry VIII or Alexander the Great.

Major System Method

If you already have [Major System](#) images for 00 to 99, you can translate those same images into card images. For example, you could translate them like this:

Suit	Number	Reason
Spades	0	0 is an s or z in the Major System, and "spades" starts with an s.
Hearts	4	4 is an r in the Major System, and the word "hearts" has an r in it.
Diamonds	1	1 is a t or d in the Major System, and "diamonds" starts with a d.
Clubs	7	7 is a k sound, and "clubs" starts with a "k" sound (even though it is written with the letter c).

Card	Number Equivalent
2 of spades	20 (spades translates to a 0, using the table above)
3 of spades	30
4 of spades	40
2 of hearts	24 (hearts translates to a 4, using the table above)
6 of hearts	64
Ace of diamonds	11 (ace is 1, and diamonds translates to a 1, using the table above)
10 of clubs	07 (10 becomes zero, because ace is 1, and clubs translates to 7, using the table above)

For more information on memorizing cards, see the [card color memorization tutorial](#), the [card memorization techniques wiki page](#), and our discussions about by searching for "speed cards" in the [Art of Memory Forum](#).

You can practice memorizing cards on [Memory League](#).

Advanced Card Memorization

If you are planning to compete in memory competitions, you might be interested in exploring more advanced card memorization systems like the [Ben System](#) and [Shadow System](#). These card systems encode two cards per image, so they require many more images.

FREQUENTLY ASKED QUESTIONS

Here are some frequently asked questions:

What are the best memory books to read?

There are hundreds of pages of free content in our [memory techniques wiki](#). If you are looking for printed books, we have a for a few book recommendations. Many of our community members have written books about memory too. You can find that information on our [memory books recommendation](#) page.

How do I memorize a book?

There is more than one way to memorize a book. Do you want to memorize a whole book or just the most important concepts in a book? Start by reading [How to Memorize a Book](#).

Memorizing every word is a difficult task and will be time-consuming even with memory techniques. There are cases of people who [memorize entire dictionaries](#) and [long works of poetry](#), so if you want to attempt something like that, check out [How to Memorize Verbatim Text](#) which links to discussions about the topic.

Where do I begin with memory techniques?

First read through this PDF ebook to get a general overview. Then head over to our [Beginners Portal](#) and [forum](#) to [introduce yourself](#).

How does one pronounce words like mnemotechnics and loci?

The word loci means "locations" in Latin. It's the plural of locus, so one would say: "1 locus and 2 loci". It is usually easier to call them "locations".

In English, "loci" is most often pronounced like the first part of "loc-ation", followed by "eye". Some people pronounce it "low-sigh". You can read discussions about it [here](#) and [here](#) for a variety of opinions.

[Mnemotechnics](#) is pronounced like the first part of "mnemo-nic", plus the "tech" in "tech-nology", and the "nics" at the end of "mnemo-nics". It means "memory techniques".



The prefix, *mnemo-*, comes from the name Mnemosyne – the Greek goddess of memory. *Mnemosyne* is pronounced "nih-MOSS-in-ee".

How do I compete in a memory competition?

You can train for memory championships and participate in online competitions on [Memory League](#). See also our [memory competition event calendar](#).

How do I learn to memorize cards more quickly?

Check out the [card deck memorization thread](#), which has over 1,200 comments in it. Post your current speed there, and ask for advice. You can also practice card memorization and compete against your friends at [Memory League](#).

What is the PAO system?

The PAO (person-action-object) system was popularized by the book [Moonwalking with Einstein](#). You can learn about it on the [PAO System](#) page and in our [Introduction to Memorizing Numbers](#) video. There is also a page that contains [PAO System examples](#).

How do I find more locations for my memory palaces?

See the wiki page on [memory palace tips](#).

How do I memorize for tests?

This is a difficult question to answer without knowing about the kind of information that you will be tested on. The best thing to do is to work through this book to become familiar with the basic memory techniques. Then post a question in the [Art of Memory Forum](#), being sure to include specific examples of what you are trying to memorize. The more examples that you provide, the easier it will be for people to help you.

Where did memory techniques originate?

According to [the Romans](#), a Greek poet named [Simonides](#) invented the [method of loci](#). However, it is probable that these location-based memory techniques were invented far earlier.

The Major System can be traced back [hundreds of years](#).

A great introduction to the history of memory techniques in European culture can be found in Frances Yates' book, [The Art of Memory](#). [The Memory Code](#) by Lynne Kelly is also excellent and highly recommended. Additional reading can be found on this [list of memory books](#).

How do I memorize formulas for math, physics, and chemistry?

Start with [this forum thread](#). There are discussions about it [here](#), [here](#), [here](#), and [here](#) too. Don't miss this great video of someone recalling [180+ physics equations](#).

People have differing ideas about the best way to do this:

1. Use [acrostics](#) – see discussions [here](#), [here](#), and [here](#)
2. Turn every number and symbol into a mnemonic image [like Shereshevsky](#)
3. Forget mnemonic techniques and just try to understand the formulas
4. Or [combine the above techniques with memory palaces](#) to keep the equations in order

We suggest reading through those discussions and then posting any questions you have in the forum.

How do I memorize a dictionary?

Watch a [short video](#) about Dr. Yip Swee Chooi, who memorized a 1,774-page Chinese-English dictionary, and then check out [dictionary memorization FAQ](#).

How do I learn mental calculation techniques?

You may want to start with a great book called [Secrets of Mental Math](#) by Arthur Benjamin and Michael Shermer. If you are visit [the forum](#), a search icon will be available in the navbar. Type mental calculation into the search box, and there are some interesting discussions about it.

If you are interested in mathematics, you may want to join these discussions:

- [Systems for calculating calendar dates](#)
- [Speed calculators: what is really useful to memorize?](#)
- [How to do divisions to many decimal places mentally?](#)
- [Stephen Hawking and math](#)
- [Anzan Flash Method](#)
- [Calculating \$10^{0.1}\$, \$10^{0.2}\$, \$10^{0.3}\$, etc.](#)
- [How to calculate squares quickly](#)
- [Estimating square roots of non-perfect squares](#)
- [Division with 2 digits simultaneously](#)
- [Avoiding the carry](#)
- [Difference of squares - even faster multiplication](#)
- [Trick for squaring 2 digit numbers above 50](#)
- [Squaring 2 digit numbers close to 100](#)

- [Guessing square roots quickly](#)
- [Lattice multiplication and drawing lines](#)
- [Famous mental calculators](#)
- [Discussion of the limitations of mental calculation techniques](#)
- [Using the method of loci and mnemonics to learn multiplication tables](#)
- [A new approach to calculating year keys](#)
- [Estimate moon phase for any date](#)
- [Analyzing Rüdiger Gamm's performance \(division by 167\)](#)
- [Analyzing Rüdiger Gamm's performance \(division by 109\)](#)

Do you have more questions? Post them in [the forum](#), and we will answer them there!

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