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Methods to Remember

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An Abecedaria Press Textbook

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Introduction

To do well in your studies, you need a good memory. Much of what we learn at school, at college and at work has to be remembered: words, names, dates, numbers, rules, and the order in which things come.

People have studied memory for thousands of years. Before books were cheap and easy to find, a good memory was one of the most important skills a person could have. It is still important today. Yet very few schools teach it. Many teachers expect students to learn how to remember on their own. Others think that a good memory is a gift: some students have it, and some do not.

This is not true. Memory is like a muscle, and it can be trained. A person who lifts weights in a gymnasium changes the shape of their body. A person who works hard in the fields becomes strong. In the same way, when you train your memory, your memory and your mind will change.

The system in this book comes from a very old idea. The teachers of the ancient Greeks and Romans taught their students to remember things by placing them, in the mind, in the rooms of a building they knew well. The system you will learn here is built on that idea, and it works extremely well.

Forwards, backwards, and in any order

There is an old saying about someone who knows something very well: "He knew it so well, he could read it backwards." With this system, you really can. You can go through what you have learnt forwards, from the first thing to the last. You can go through it

backwards, from the last thing to the first. You can even learn it backwards. And you can go straight to any one place: the 7th thing, or the 32nd.

How does it work? In Part One you will build a room in your mind. The room is divided into squares, and every square has a number: 1, 2, 3, and so on, up to 50. Each square is a place where you can put something you want to remember. Because the squares are numbered, the things you put in them stay in order.

Here is an example. Say you have to learn a long poem. For each line of the poem, make a picture in your mind, or simply take the words of the line as they are. Put the first line in square 1, the second line in square 2, and so on. When you want to say the poem, walk through the squares in your mind, one by one. Each square gives you back its line.

What you can use it for

You can use the memory room for anything that has to be remembered in order. For example:

- the chapters of a book, in order, and what is in each chapter;
- the important law cases on one subject;
- the elements of the periodic table;
- the points of a speech, or of an answer in an examination.

There are many other uses, and you will find your own.

How this book is arranged

Part One teaches the memory room. Part Two teaches the Major System: a number code that turns numbers into words, so that you can remember dates and figures. Part Three explains some difficult sounds and gives you exercises, with a list of words for every number from 0

to 99. Part Four shows you how to use the memory room, by learning the elements of the periodic table in order. Part Five shows you how to learn a poem with the memory room, and gives you a speech to try by yourself.

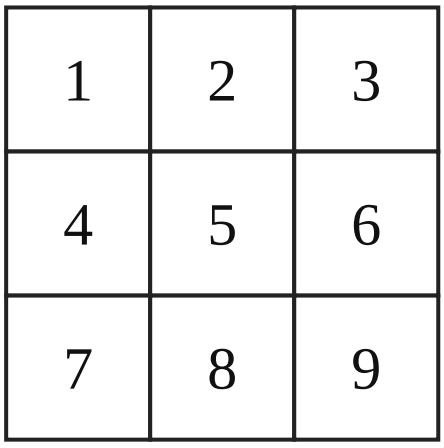
Part One: The Memory Room

Step One: get comfortable

Sit with your back to the fireplace, or to a wall of your room. Pick a square room that has four walls: you will be imagining yourself sitting with your back against one of those walls. Every time you imagine yourself in this room, you will be sitting in the same place.

The floor

Imagine the floor is divided into nine squares, three squares to a row. This is like a big game of noughts and crosses (tic-tac-toe) laid out on the floor in front of you, covering the whole floor of the room. The square furthest away from you, on the left, is square number 1. Then comes square number 2, and on the right-hand side, furthest away from you, square number 3. The middle row is 4, 5, 6, and the row right where you are is 7, 8, 9. You are sitting in square number 8.



you sit in 8

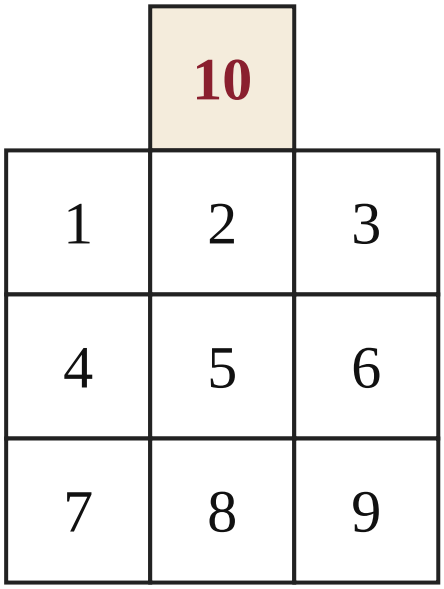
The floor

These nine are the nine squares in the middle of the diagram.

The first wall: the tens

The wall on your left is the first wall. Divide it, too, into nine squares, with another noughts-and-crosses board, and number them the same way, starting from the top left-hand corner of the wall as you turn to face it: 1 to 9.

You will notice that we have gone 1 to 9 on the floor, and then back to 1 to 9 on the wall, which is not particularly useful. So, on the ceiling, directly above the 2 of this wall, imagine one more square, sticking up above the board. That square is 10. Everything on this wall is in the tens: its 1 is really 11, its 2 is 12, its 3 is 13, and so on until we get to 19.

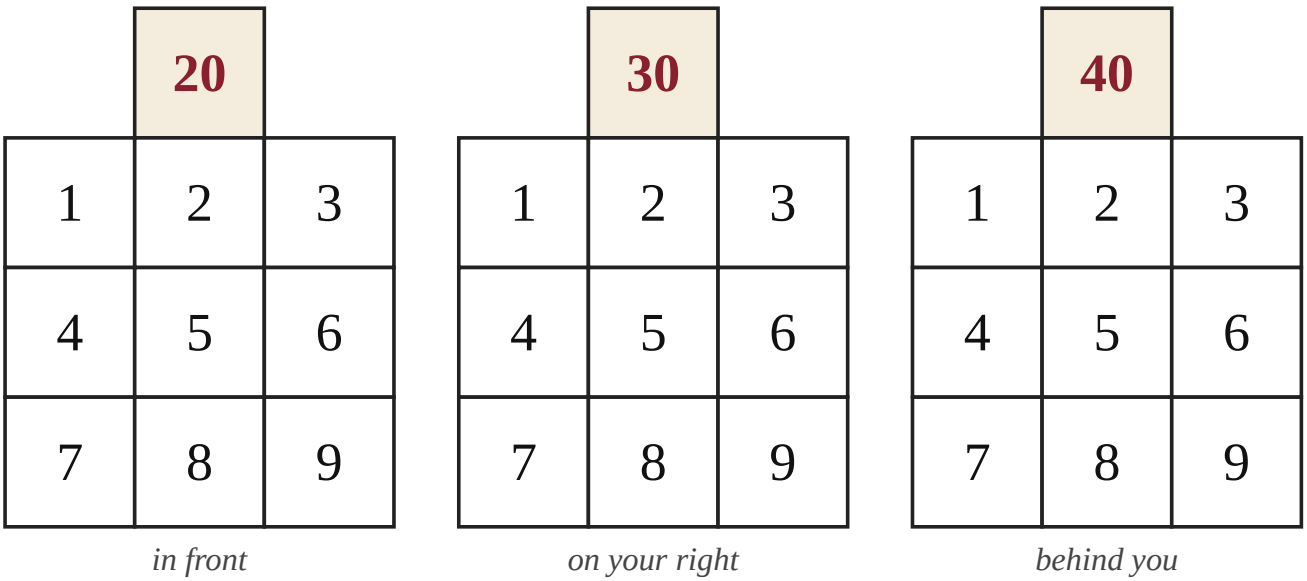


The first wall, with 10 above it

Now compare the wall with the floor, and note the consistency: the wall is numbered exactly like the floor. Don't remember the wall as 11, 12, 13, but as plain single digits, with the 10 placed just above the wall, on the ceiling. Everything below the 10 is in the tens.

The other three walls

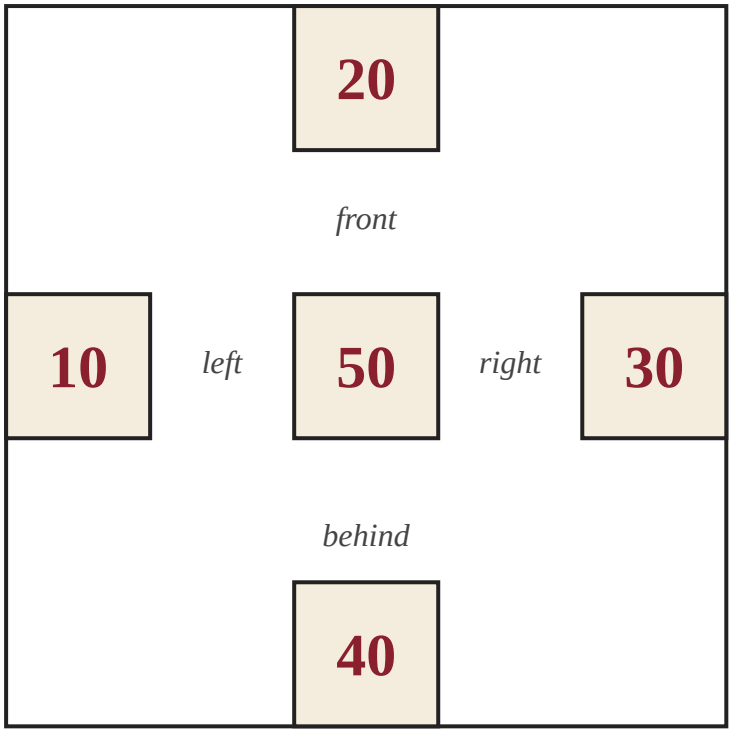
Then do the same for the remaining walls. The wall in front of you is the second wall: above it, on the ceiling, is 20, and its squares are 21, 22, 23, up to 29. The wall on your right is the third wall, with 30 above it: 31 to 39. The wall behind your back is the fourth wall, with 40 above it: 41 to 49.



The second, third and fourth walls

The ceiling: 50

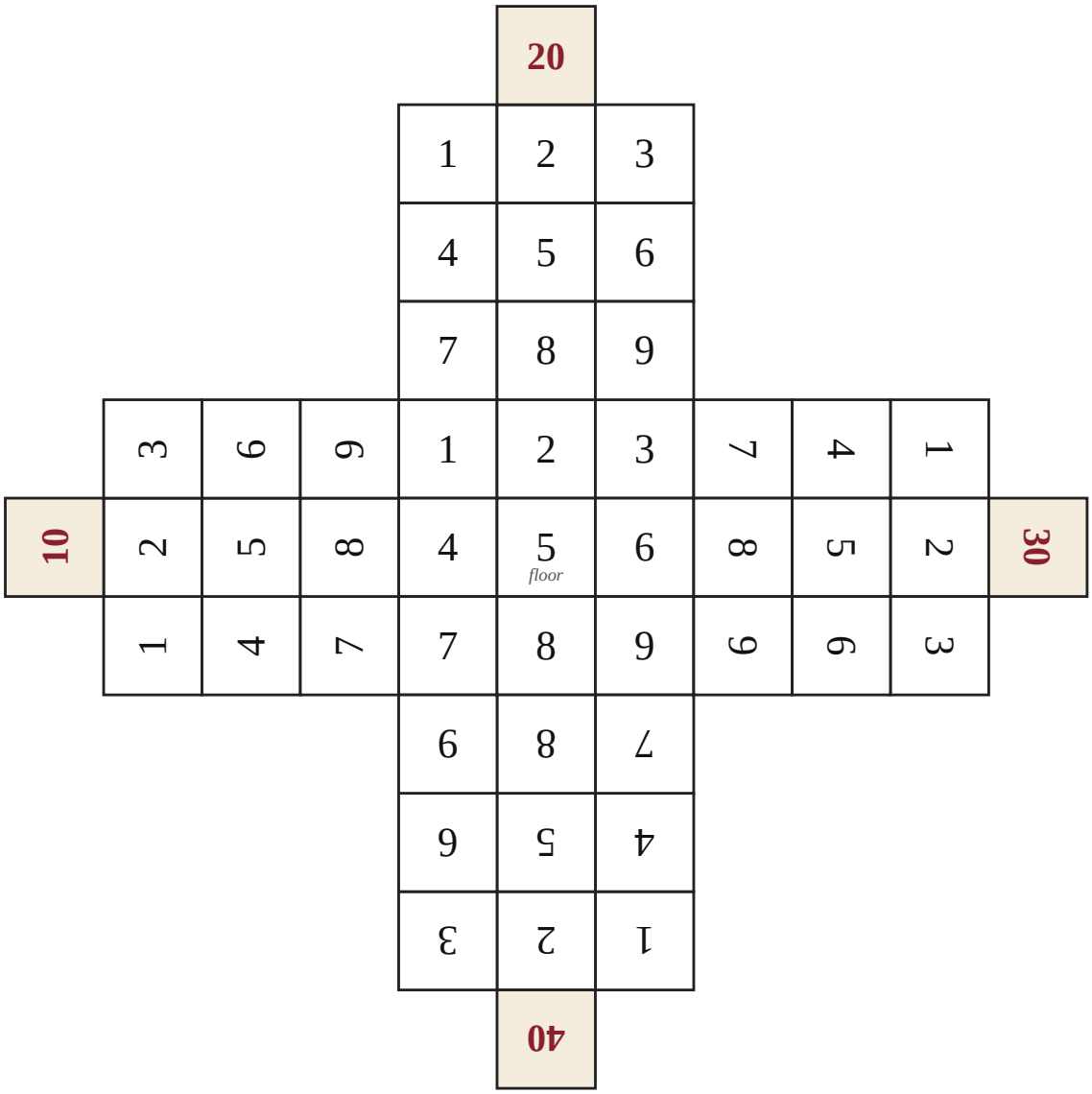
Right in the middle of the ceiling, where the light or lamp would be, place one more square. Sometimes in the middle of a ceiling there is a beautiful plaster ceiling rose with the lampshade hanging from it; sometimes it is just a lamp. That is square number 50, right in the middle of the ceiling above your head.



The ceiling, as you look up

So we have fifty places, or *loci*, in this room.

The diagram



The memory room, unfolded

Examine the diagram. If you cut it out and folded it up, with the numbers on the inside, you would have your room: the floor in the middle, the four walls folded up around it, and the 10, 20, 30 and 40 on the ceiling above their walls. Drawing the diagram out on a large sheet of card and making the cube can also be of assistance.

Or find an old cardboard box. Draw the noughts-and-crosses board on the inside of the bottom of the box for the floor, and then on the inside of each wall. Cardboard boxes usually have folding leaves that close to make the lid: draw the 10, 20, 30 and 40 on the inside of those. Draw on the inside of the box, not the outside.

Take some time to get this pattern firmly into your head. I would spend a good ten minutes running over it in your mind's eye.

More rooms

Once this room is finished, we can imagine ourselves opening a door in the wall and going into another room, and after that room into yet another. The important thing is to remember which room comes after which. The first room holds the numbers 1 to 50, the second 51 to 100, and so on. You can put one of these memory rooms in every room and closet in your home.

Setting this system up in your head requires a small investment of time. Once you have it, you will have it with you for life.

The memory room comes from Gregor von Feinaigle's New Art of Memory *(1812), as set out by Francis Fauvel-Gouraud in* Phreno-Mnemotechny *(1845). Part Two teaches the Major System, a code for turning numbers into words.*

Part Two: The Major System

Introduction to the number code

The Major System is a number code: it turns numbers into words. Why is this useful? Because we speak in words, and words are easy to remember. It is very easy to remember a short poem, a sentence, or someone's name. A long row of numbers is much harder to remember, and much easier to forget. With the code, you can remember numbers that are very, very long.

The idea is simple. Each number from 0 to 9 has its own sound. To turn a number into a word, you take the sounds for its numbers and put vowels (a, e, i, o, u) between them. For example, in the Major System m is 3, t is 1 and r is 4. So the number 314 can become the word *motor*, or *meteor*, or *mother*. You will learn all ten sounds in this part of the book.

A challenge: the number pi

Pi is the number you get when you divide the distance round a circle (its circumference) by the distance across it (its diameter). It begins 3.14159, and it never ends. People have learnt thousands of its decimal places by heart. How many decimal places of pi can you remember? Set yourself a challenge, and see how far you can go. (The word *motor* already gives you the first three numbers: 3, 1, 4.)

Everyday uses

The code is useful every day. You can use it to remember the PIN for your bank card, the code for a door, a telephone number, or an important date. Never write your PIN on your card: keep it in your memory instead.

Passwords

Today we need many passwords to stay safe online. A good password is long, and it is different for every account. A password made of a long number and some words is very hard to break. But a long password is also hard to remember.

The memory system gives you both the numbers and the words. The code turns a long number into words, and the words back into the number. The room keeps your passwords in order, one in each square. Because you can make your passwords long quite easily, they are easy for you to remember, and very hard for anyone else to break.

Introducing Mr Gouraud

Before we learn the code, let us meet the man who made it famous.

Mr Gouraud was a Frenchman. His full name was François Fauvel-Gouraud, and he was born in 1808. He was a man of great learning, and he spoke five or six languages.

As a boy, Mr Gouraud had a very bad memory for numbers. He could not remember the dates of history, and he could not even remember the date of his own birthday, although he had learnt it a hundred times. His parents wanted him to become an officer in the navy, and for that he needed to be good at mathematics. So they sent him on a long voyage around the world, on his uncle's ship, with a teacher of his own. The teacher showed him a memory system that changed numbers into words. The boy loved it. He used it to remember dates and numbers in his hours of study, and even in his free time. Soon he began to look for ways to make the system simpler and better.

In 1839 Mr Gouraud went to America. He was a pupil of Louis Daguerre, the Frenchman who invented one of the first kinds of photography, and he was one of the first people to show photography in America. Later he travelled from city to city, giving lectures on memory. In 1844 and 1845 he published his books on the art of memory, including a dictionary that gives words for thousands of numbers. His lectures and books made him very famous, and many people learnt his system. He died in New York in 1847, when he was only 39 years old.

Mr Gouraud did not invent the system. People had been changing numbers into letters for more than two hundred years before him. But he made it simpler and easier to use, and he taught it to a great many people. The code you will learn here is the one Mr Gouraud taught.

The ten sounds

Here is the code. Each number from 0 to 9 has its own sound. Learn this table by heart before you go on. The last column gives you a small help for remembering each sound.

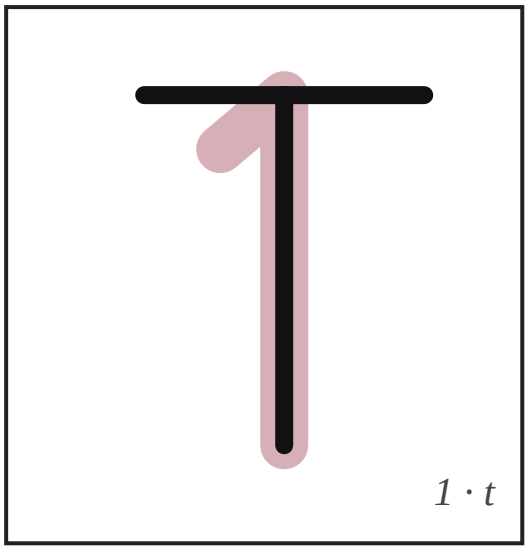
Number	Sound	To help you remember
0	s, z, and c when it sounds like s (as in *city*)	*z* is the first sound of *zero*
1	t, d, th	*t* has one stroke down
2	n	*n* has two strokes down
3	m	*m* has three strokes down
4	r	*r* is the last sound of *four*
5	l	*L* is the Roman number for 50
6	j, sh, ch, and g when it sounds like j (as in *gem*)	a *J* turned round looks like a 6
7	k, q, and c or g when they are hard (as in *cat* and *go*)	a *K* can be made from two 7s
8	f, v, and ph	a written *f* has two loops, like an 8
9	p, b	a *P* turned round looks like a 9

The vowels, a, e, i, o and u, have no number. Nor do the letters w, h and y. You can put them anywhere you like, to help you make a word.

Help for remembering the sounds

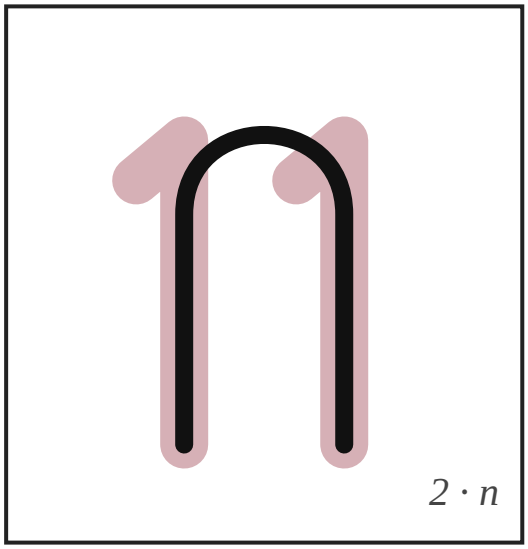
Here is more help for remembering each sound. In each drawing the number is pale red, and the letter is drawn over it in black.

1 is t. A t has one stroke down, like the number 1.



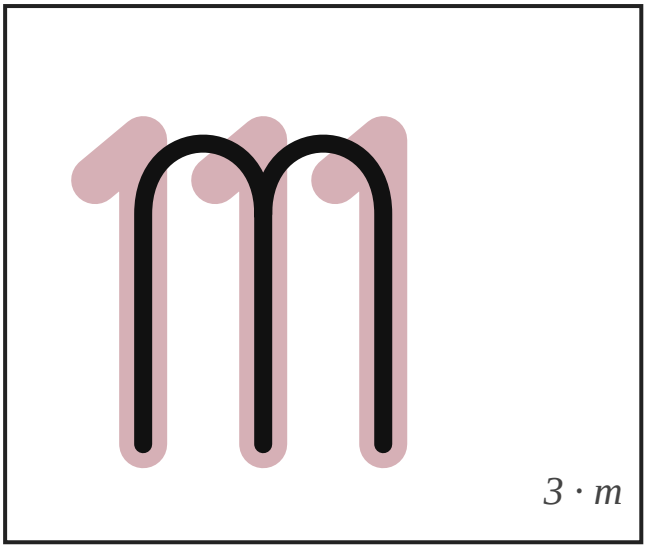
1 is t

2 is n. An n is two 1s, joined at the top by an arch.



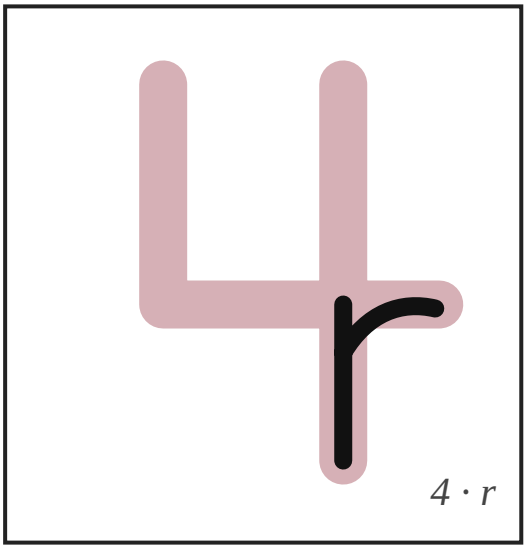
2 is n

3 is m. An m is three 1s, joined by two arches.



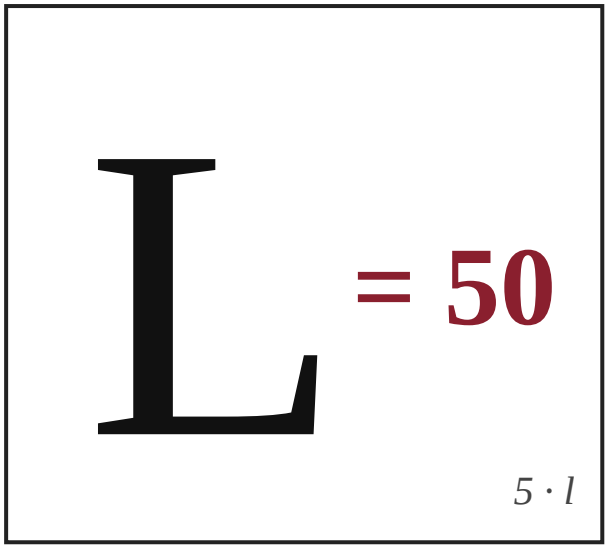
3 is m

4 is r. The r is the last sound of the word *four*. Now look at the open 4, the way many people write it by hand. At the bottom right, where the two lines cross, they make a right angle. That is where the r is.



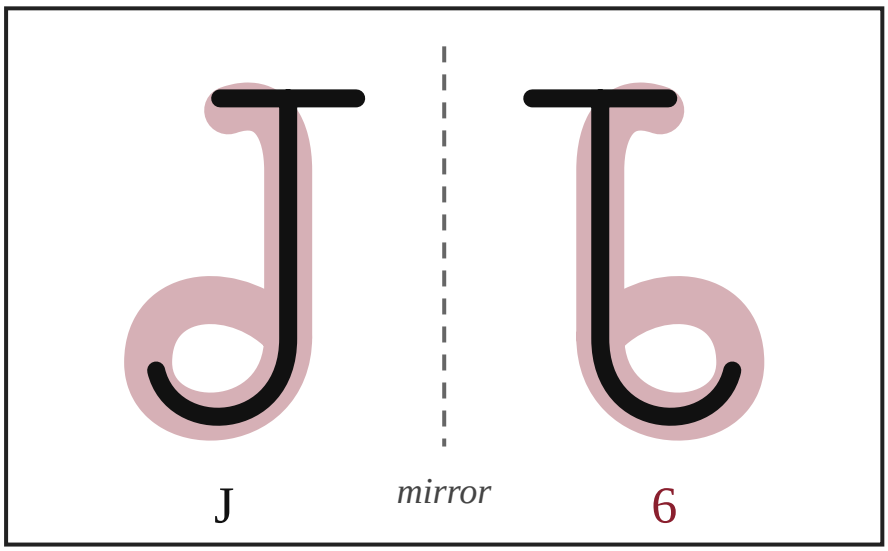
4 is r

5 is l. In Roman numbers, L is 50.



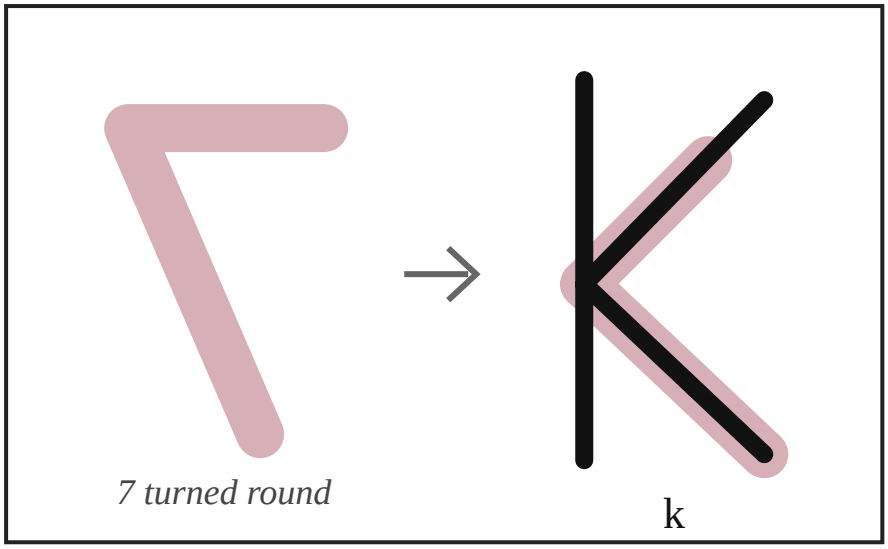
5 is l

6 is j. Look at a J in a mirror, and it becomes a 6.



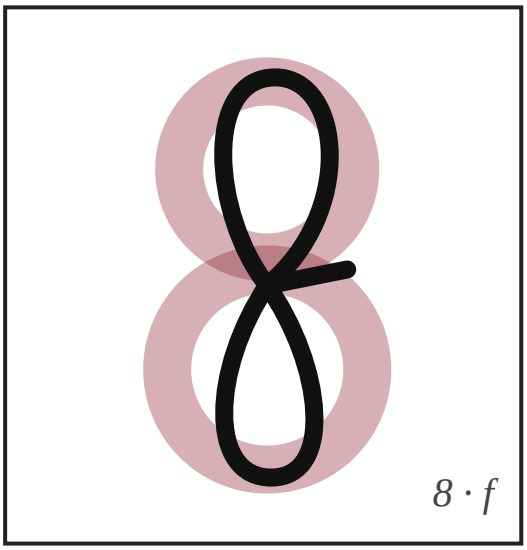
6 is j

7 is k. A k is a long line, with a 7 turned round and leaning against it.



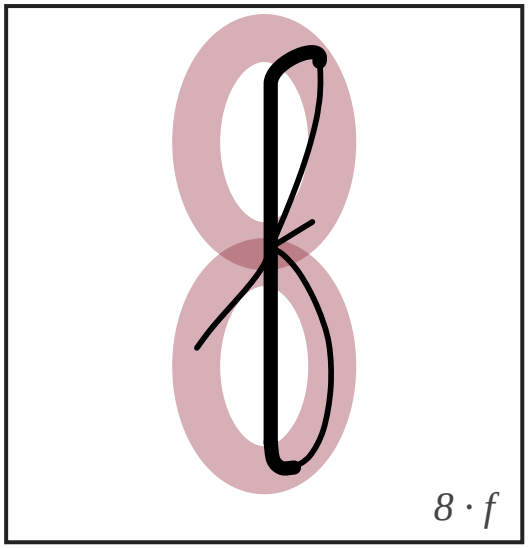
7 is k: a 7 turned round, leaning against a line

8 is f. A handwritten f, with a loop above and a loop below, looks like an 8.



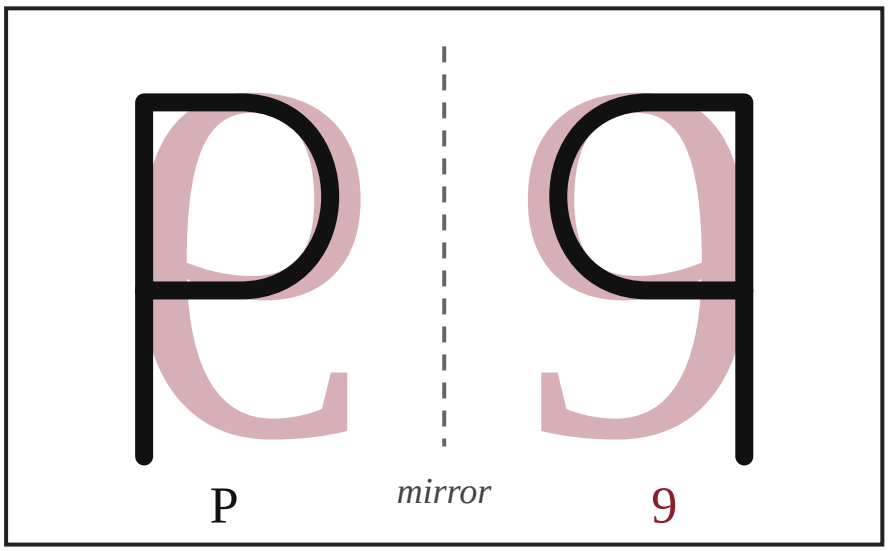
8 is f

Here is the f from the cursive alphabet in our handwriting books. It has the same two loops.



8 is f: the cursive f

9 is p. Turn a P round, as in a mirror, and it looks like a 9.



9 is p

Examples

To turn a number into a word, take the sound for each number, in order, and put vowels between them. In each little table below, the numbers are on top and the word is underneath. The letters that give the numbers are in **bold**.

1	2
tin	

We hear t and n: 1 and 2. The i is a vowel, so it has no number. Listen to the sounds, not the spelling.

2	5
nail	

We hear n and l: 2 and 5. The a and the i are vowels, so they have no number. It is the sounds that count, not the letters.

9	1
bed	

We hear b and d: 9 and 1. Sound, not spelling.

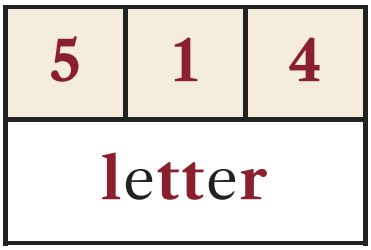
7	3
game	

The g in game is hard, as in go, so it is 7. The m is 3. The e at the end is not spoken, and it is a vowel, so it has no number. Always listen to the sound.

It works by sound, not by spelling

The code works by the sound of a word, not by the way it is written. Here are the rules.

A double letter makes only one sound, so it counts only once. In the word *letter* there are two t's, but we hear only one t. We do not say "let-ter", we just say "letter".



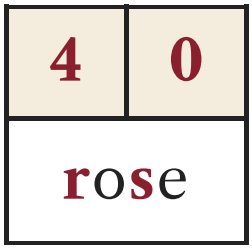
> *Two t's, but only one t sound: l, t, r, so 5, 1, 4. Count what you hear, not what you see.*

Do not use words with letters that are written but not spoken, like the *k* in *knee* or the *b* in *comb*. The *b* has a number of its own, and a letter like this can confuse you later. Choose words where every letter that has a number is a letter you can hear.

What counts is the sound you hear. In *phone*, the *ph* sounds like f, so it is 8. In *rose*, the *s* sounds like z, so it is 0.



> *Two letters, ph, but one sound, f, so it is 8. Then n is 2. Count the sounds, not the letters.*



> *The s in rose sounds like z. Both s and z are 0, so rose is 40. It is the sound that counts.*

More than one word

Sometimes more than one word can come out of the same number. Take 314:

3	1	4
motor		

> *m, t, r: 3, 1, 4. The o's are vowels, so they have no number. Listen to the sounds, not the spelling.*

3	1	4
meteor		

> *Meteor has more vowels than motor, but vowels have no number, so the number is the same: m, t, r, 3, 1, 4. Sound, not spelling.*

3	1	4
mother		

> *The th in mother is two letters, but one sound, and it counts as t: 1. So mother is m, th, r: 3, 1, 4.*

All three words give the same number, 3 1 4. Choose the word that is easiest for you to remember.

Pi again

Pi begins 3.14159. Split the numbers into two groups, 314 and 159, and make a word from each:

3	1	4
motor		

> *Again, only the sounds count: m, t, r, 3, 1, 4.*

1	5	9
tulip		

> *We hear t, l and p: 1, 5 and 9. The u and the i have no number. Listen to the sounds.*

Motor tulip: two words, and you have the first six numbers of pi.

Making passwords

Staying safe on the internet

Today we use the internet for almost everything: for banking, for shopping, for email, and for talking to our friends and family. Each of these needs a password.

Now that artificial intelligence can look into websites, it has become more important than ever to keep your passwords safe. Every password you have, for every site, must be different. Then, if one site is broken into, your other accounts are still safe. And you should not keep your passwords saved anywhere, for reasons of security. Keep them in your memory instead.

We also advise you to use two-factor authentication whenever a site offers it. This means that, as well as your password, the site asks for a second proof that it is really you, for example a code sent to your

telephone. If you have a smartphone, then, when the option is available, use an authenticator application: a small program on your phone that makes a new code every few seconds.

This sounds hard, but the Major System makes it easy. In this chapter we will give you some methods for making passwords that are long, different for every site, and easy for you to remember.

Method one: a name from your family

Take the name of someone in your family. Let us say that your mother is called Margaret Fisher, and your father is called Peter Jones.

First, write the names down. Then find the number for each name, using the code. Remember: we listen to the sounds, not the spelling.

3	4	7	4	1
Margaret				

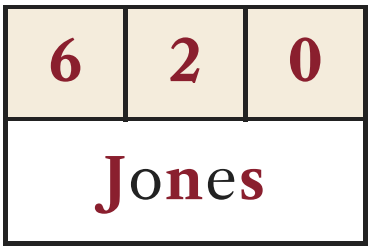
> *The g in Margaret is hard, as in go, so it is 7. Then r is 4, and t is 1. The vowels have no number. Sound, not spelling.*

8	6	4
Fisher		

> *The sh in Fisher is two letters, but one sound: 6. Count the sounds, not the letters.*

9	1	4
Peter		

We hear p, t and r: 9, 1 and 4. Listen to the sounds.



The j is 6 and the n is 2. The s in Jones sounds like z, and z is 0. It is the sound that counts.

Now put the names and the numbers together. That is your password:

```
Margaret34741Fisher864
```

```
Peter914Jones620
```

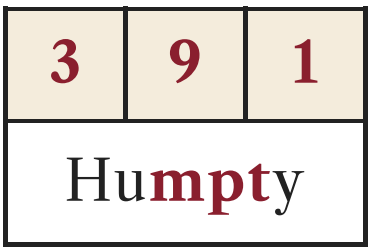
These passwords are long, and they mix capital letters, small letters and numbers, so they are very hard to break. But you do not need to remember the numbers at all. You only need to remember the names, and the code gives you the numbers again whenever you need them.

Method two: a line from a poem

Take a line from a poem that you know well. For example:

```
Humpty Dumpty sat on a wall
```

Now work out the numbers for each word, just as before. Remember: we listen to the sounds, not the spelling.



The h has no number, and neither has the y. We hear m, p and t: 3, 9 and 1.

1	3	9	1
Dumpty			

> *We hear d, m, p and t: 1, 3, 9 and 1. The u and the y have no number.*

0	1
sat	

> *We hear s and t: 0 and 1. A number may begin with 0. That is fine.*

2
on

> *We hear only n: 2. The o is a vowel, so it has no number.*

The word *a* is only a vowel, so it has no number at all.

5
wall

> *The w has no number. Two l's, but only one l sound: 5. Count what you hear, not what you see.*

Now put the line and the numbers together. There are three ways to do this.

The best way: word, number, word, number. Write each word, and after it put its number: Humpty and its number, Dumpty and its number, sat and its number, on and its number. The word *a* has no

number. Then wall and its number.

```
Humpty391Dumpty1391Sat010n2AWall5
```

This is the way we recommend. It is the easiest, because you work one word at a time: you write the word down, then you turn that word into its number, and then you go on to the next word. You never have to hold much in your head at once.

Another way: the whole line, then all the numbers. Write the whole line first, and then all the numbers together, in one row.

```
HumptyDumptySatOnAWall39113910125
```

A third way: only the numbers. You can also use just the numbers, without the words.

```
39113910125
```

This is shorter, and so it is less secure. It is better to keep the words.

The first two passwords are 33 letters and numbers long. They are extremely hard to break, and they are easy for you to remember, because you already know the line, and the code gives you the numbers.

This method works in any language. The line does not have to be in English. The code works by sound, and a sound is the same sound in any language.

Bank PINs

For a password, we start with words and turn them into numbers. With a bank PIN we go the other way. The bank gives you the numbers, and you find a word for them. Then you only have to remember the word, and the word gives you back your PIN.

When the bank gives you a PIN

Here are four PINs that a bank might give you, and a word for each one.

9	5	2	1
planet			

> *We hear p, l, n and t: 9, 5, 2 and 1. The vowels have no number. Sound, not spelling.*

1	4	7	5
trickle			

> *The ck in trickle is two letters, but one k sound: 7. The e at the end is not spoken, and it is a vowel. Count the sounds, not the letters.*

8	4	3	5
formal			

> *We hear f, r, m and l: 8, 4, 3 and 5. Listen to the sounds.*

7	3	1	0
comets			

> *The c in comets is hard, as in cat, so it is 7. Then m is 3, t is 1, and s is 0. It is the sound that counts.*

If you cannot find one word for your PIN, use two short words, one for each half. For 2963:

2	9
nap	

> *We hear n and p: 2 and 9.*

6	3
jam	

> *We hear j and m: 6 and 3. So nap jam gives you 2963. Sound, not spelling.*

When you can choose your own PIN

Sometimes the bank lets you choose your own PIN. Then you can start with a word. Choose a word that you like, with exactly four sounds that have numbers. Turn it into numbers, and that is your PIN.

7	4	1	2
garden			

> *The g in garden is hard, as in go: 7. Then r, d and n: 4, 1 and 2. So your PIN is 7412.*

5	3	2	1
lemonade			

> *We hear l, m, n and d: 5, 3, 2 and 1. The vowels have no number, and the e at the end is not spoken. So your PIN is 5321.*

Do not choose a PIN that is easy to guess, such as 1234, or the year you were born. A word gives you a number that nobody else can guess, and that you will never forget.

Telephone numbers

Nowadays a lot of people do not know any telephone numbers. Some people do not even know their own. But it is useful to know telephone numbers. You cannot always have your phone with you, and its battery can run out just when you need it. It is good to know a few important numbers by heart, and the emergency numbers above all.

The same method helps with other long numbers too, such as the postcode where you live, if your country uses a long postcode made of numbers.

Emergency numbers

Learn the emergency number for the country where you live. In many countries, including all of Europe, it is 112. In the United Kingdom it is 999, and in the United States and Canada it is 911.

1	1	2
today now		

> *We hear t, d and n: 1, 1 and 2. The w and the y have no number. Sound, not spelling.*

9	9	9
p	op-	up

We hear three p sounds: 9, 9 and 9. Listen to the sounds.

9	1	1
b	eat	it

We hear b, t and t: 9, 1 and 1. The vowels have no number.

A full telephone number

Here is a made-up telephone number from London:

```
020 7946 0152
```

There are different ways to make words for it. Choose the one that works best for you.

One way: a word for each group

Telephone numbers are usually written in groups. Find a word, or two short words, for each group.

0	2	0
sn	ooz	e

We hear s, n and z: 0, 2 and 0. The s and the z are both 0. The e at the end is not spoken. It is the sound that counts.

7	9	4	6
copper shoe			

> *The c is hard, as in cat: 7. Two p's, but one p sound: 9. Then r is 4, and sh is one sound: 6. Count the sounds, not the letters.*

0	1	5	2
stolen			

> *We hear s, t, l and n: 0, 1, 5 and 2. Listen to the sounds.*

So the number is *snooze, copper shoe, stolen*. A strange little story is easy to remember: someone was asleep, and their copper shoe was stolen.

Another way: two numbers at a time

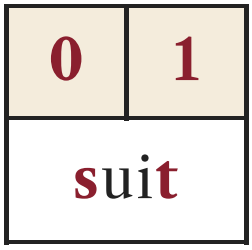
You can also split the number into pairs, and find a short word for each pair. Short words are quick to find.

7	9
cap	

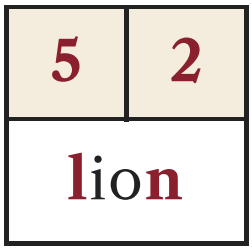
> *The c is hard: 7. The p is 9.*

4	6
rush	

> *We hear r and sh: 4 and 6. Two letters, sh, but one sound.*



> *We hear s and t: 0 and 1. The u and the i have no number.*



> *We hear l and n: 5 and 2. Sound, not spelling.*

If you already know the first part of a number, such as 020 for London, you only need words for the rest: *cap*, *rush*, *suit*, *lion* gives you 79 46 01 52, and the number is 020 7946 0152.

Try it with the numbers that matter to you: your own number, your family's numbers, and a friend you could call in an emergency.

Part Three: Difficult sounds and exercises

Difficult sounds

Most words are easy: you listen to the sounds, and each sound gives you its number. But a few sounds need a word of explanation.

ng, as in *sing*

The ng in *sing* counts as an n. It is 2.

0	2
sing	

> *We hear s and ng: 0 and 2. The ng counts as n. Sound, not spelling.*

ed, as in *jumped*

Here we make one exception. In *jumped*, the ed at the end sounds like t, but we go by the letter, and count it as d. Most people think of ed as a d, and that is the easiest way to remember it. And it makes no difference to the number, because t and d are both 1.

6	3	9	1
jumped			

> *We hear j, m and p: 6, 3 and 9. The ed we count as d: 1. So jumped is 6391.*

ch, as in *church* and *anchor*

The letters ch can make two very different sounds. In *church* they make the ch sound, which is 6. In *anchor* they make a k sound, which is 7. We go by the sound, and you will hear the difference easily.

6	4	6
chur**ch**		

Both ch's in church make the ch sound: 6. The r is 4. So church is 646.

2	7	4
a**nch**or		

In anchor, the ch sounds like k, so it is 7. The same letters, but a different sound, and a different number. It is the sound that counts.

x, as in *box* and *xylophone*

The letter x can make two sounds. In *box* it sounds like k and s together, so it gives two numbers: 7 and 0. At the start of a word like *xylophone* it sounds like z, so it is 0. Again, we go by the sound.

9	7	0
bo**x**		

We hear b, then k and s: 9, 7 and 0. One letter, x, but two sounds, so two numbers. Count the sounds, not the letters.

0	5	8	2
xyl**ph**one			

The x at the start sounds like z: 0. Then l is 5, ph sounds like f: 8, and n is 2. Sound, not spelling.

qu, as in *queen*

The letters qu sound like k, with a w after it. The k is 7, and the w has no number.

7	2
queen	

> *We hear k and n: 7 and 2. The w sound in qu has no number.*

Practise every day

The code becomes easy with practice. Practise a little every day, with the numbers you see around you: the numbers on cars, on houses and on buses, the prices in a shop, the page numbers in a book. Each time you see a number, turn it into a word.

Exercise 1: from numbers to words

Find a word for each number. There is more than one right answer. You will find some answers at the end of this part.

14 · 27 · 33 · 42 · 58 · 61 · 74 · 81 · 95 · 19 · 86 · 49

Exercise 2: from words to numbers

Turn each word into its number. Remember: listen to the sounds, not the spelling.

lamp · ticket · pencil · window · rabbit · summer · jacket · elephant · pocket · bottle · music · tomato

Words for every number from 0 to 99

Mr Gouraud's dictionary gives words for thousands of numbers. Here is one word for every number from 0 to 99. We chose them from his dictionary and from modern English, and we chose words where the spelling and the sound give the same number, so that they are easy to learn.

Notice that 0 and 00 are not the same number, and neither are 1 and 01. A number that begins with 0 has its own word.

0 to 9

0	1	2	3	4
sea	tea	hen	ham	ray
5	**6**	**7**	**8**	**9**
eel	shoe	key	hoof	bee

00 to 09

00	01	02	03	04
sauce	seat	sun	swim	zero
05	**06**	**07**	**08**	**09**
seal	sash	sock	sofa	soap

10 to 99

10	11	12	13	14
dice	tattoo	tin	dome	tree
15	**16**	**17**	**18**	**19**
tail	dish	dog	dove	tub
20	**21**	**22**	**23**	**24**
nose	net	onion	name	winner
25	**26**	**27**	**28**	**29**
nail	inch	neck	navy	nap
30	**31**	**32**	**33**	**34**
mouse	meat	moon	mummy	hammer
35	**36**	**37**	**38**	**39**
mule	mash	mug	movie	map
40	**41**	**42**	**43**	**44**
rose	rat	rain	arm	roar
45	**46**	**47**	**48**	**49**
rail	arch	rock	roof	rope
50	**51**	**52**	**53**	**54**
lace	lid	lion	lime	lawyer
55	**56**	**57**	**58**	**59**
lily	leash	lake	leaf	lip

60	61	62	63	64
cheese	sheet	chain	jam	chair
65	66	67	68	69
shell	shush	chick	chef	ship
70	71	72	73	74
goose	cat	queen	gum	car
75	76	77	78	79
coal	cage	cake	cave	cap
80	81	82	83	84
face	foot	fan	foam	fire
85	86	87	88	89
fly	fish	fig	five	fib
90	91	92	93	94
bus	bat	pan	poem	bear
95	96	97	98	99
ball	beach	book	beef	baby

Learn these words a few at a time, ten a day. When you know them, you can turn any long number into words very quickly, two numbers at a time.

Answers

Exercise 1. Here is one word for each number. Your words may be different, and still right.

14 tree · 27 neck · 33 mummy · 42 rain · 58 leaf · 61 sheet · 74 car · 81 foot · 95 ball · 19 tub · 86 fish · 49 rope

Exercise 2.

lamp 539 · ticket 171 · pencil 9205 · window 21 · rabbit 491 · summer 034 · jacket 671 · elephant 5821 · pocket 971 · bottle 915 · music 307 · tomato 131

Part Four: Using the memory room — the periodic table

Why the room is so useful

In this part we will use the memory room to learn the elements of the periodic table, in the order of their atomic number.

Each square in the room has a number. So we do not need to remember the number of an element at all. We only need to find a way to put the element into its square. Then, if you want to know which element has atomic number 9, you just go to square 9 in your mind, and look in it. You will see what is there.

To do this well, you need a few skills. We will teach them to you one at a time.

The first skill: imagination

Most names of elements are words that do not have a picture. You cannot see "helium". So the first skill is to turn a word that has no picture into a word that does have a picture.

Sometimes the picture is the thing itself, or something that uses it. Sometimes it is something that only sounds like the word, or reminds you of it.

Take *helium*. There are two ways we could remember it.

One way: the party balloons at a children's birthday party are often filled with helium. So we put a picture of a helium balloon inside the square. That balloon is helium.

Another way: the word *helium* begins like the word *hell*. So we make a picture of the devil. Perhaps the devil is also holding a helium balloon. We put him in the square, and that is how we remember what is in that square.

Here are some things that help:

- Make your picture big, bright and clear.
- Make it strange or funny. We remember strange things much better than ordinary ones.
- Make it move: the balloon floats, the devil laughs.
- Put it firmly in its square, and look at it there for a moment.

Some people do not make pictures at all. They simply put the word itself into the square, and see it written there. That works too. Use the way that works best for you.

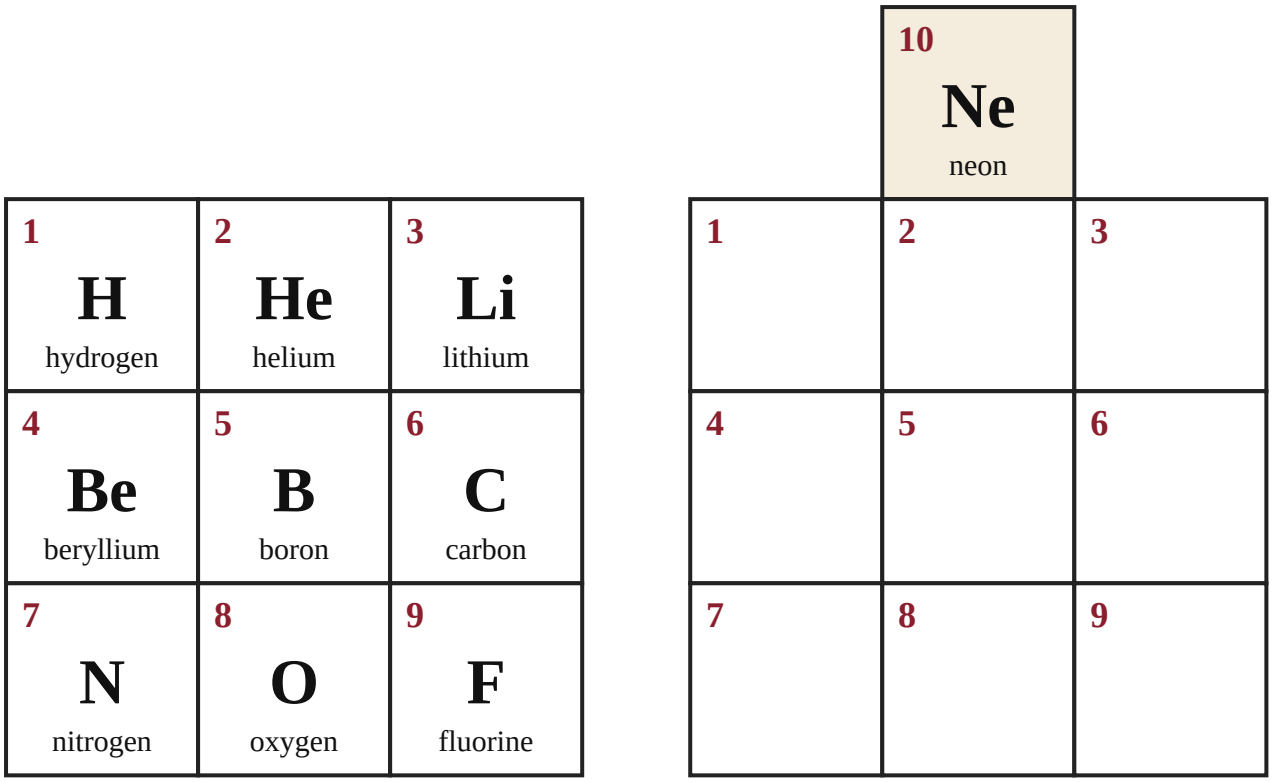
The first ten elements

Here are the first ten elements, in order of their atomic number:

Atomic number	Element
1	Hydrogen
2	Helium
3	Lithium
4	Beryllium
5	Boron
6	Carbon
7	Nitrogen
8	Oxygen
9	Fluorine
10	Neon

The first ten elements, in order of atomic number

The first nine go on the floor. Number 10 goes in the tens square on the ceiling, above the first wall, on your left.



the floor *the first wall, with 10 above it*

The first ten elements in the memory room

Placing the elements, one by one

Sit in your room, in your usual place, in square 8. Now we will put each element into its square. For most of them we give you more than one picture. Choose the one you like best, or put two together.

1 — Hydrogen. Square 1 is on the floor, far away from you, on the left. *Hydrogen* begins like *high*, so put a ladder in square 1, because a ladder goes up high. Or put a fire hydrant there, the red pipe in the street that firemen use to put out fires. Or put both: a fire hydrant at the top of the ladder.

2 — Helium. Square 2 is in the middle of the far row. Here is the devil, laughing, holding a big helium balloon, the kind of balloon children have at a birthday party. That is helium.

3 — Lithium. Square 3 is far away on the right. *Lithium* sounds like *light*, so just imagine an electric light bulb, shining in square 3. Or imagine a battery, a lithium battery, if you know what one looks like.

4 — Beryllium. Square 4 is in the middle row, on the left. *Beryllium* sounds like *berry*, so you can put a berry there. Or perhaps you know a lady called Beryl, because Beryl is a lady's name. Imagine her, or any lady called Beryl, and what she looks like. She is eating a berry, and you put her in square 4.

5 — Boron. Square 5 is in the very middle of the floor. *Boron* sounds like *boar*, and also like *bored*. So make a picture of a boar, which is a male pig, sitting there looking very bored. Or just a picture of yourself, looking very bored, in square 5. And you can also *bore* a hole in something, so another way is to imagine a drill boring a hole in a piece of wood. That is boron.

6 — Carbon. Square 6 is in the middle row, on the right. *Carbon* is very simple: it sounds like *car*. Make a nice big car, and make sure it is a black one, because carbon is usually black. A black sports car, a Ferrari for example, comes zooming out of square 6. That is carbon.

7 — Nitrogen. Square 7 is in the row next to you, on your left. *Nitrogen* sounds like a *knight* in shining armour, like in the stories of King Arthur. There he is, beside you, clanking about in his noisy armour. Maybe he is sitting on a horse. That is number 7, nitrogen.

8 — Oxygen. Square 8 is where you are sitting. *Oxygen* begins like *ox*: a great big ox, with large horns. Maybe the ox is in a hospital, wearing an oxygen mask. But either way, that is your ox, ox for oxygen.

9 — Fluorine. Square 9 is next to you, on your right. That one is easy: *fluorine* sounds like *floor*, and there is fluorine in toothpaste. So imagine the floor of square 9 covered in toothpaste, with a tube of toothpaste sitting there too. That is fluorine.

10 — Neon. Square 10 is on the ceiling, above the first wall on your left. *Neon* is very simple: it sounds like *knee*. So just imagine a knee up there, and that is neon, number 10. Or, if you like, imagine a neon sign, the kind of bright sign used for advertising. Perhaps it is an advertising sign showing someone's knee. That is neon.

How this works: a reminder

As you can see, we have done different things here to help us remember these words. Often we thought about what a word sounds like. *Neon* sounds like *knee*, so we made a picture of a knee. *Helium* sounds a little like *hell*. And *lithium* looks a little like *light*, if you look at the way the word is spelled. This is one good way to deal with a word that is strange and unusual.

So sometimes we have to change a word, and twist it a little, to make this work. The pictures are not always direct. We have to use our imagination, and be like poets of pictures. And the stranger the pictures are, the better.

Why this method was forgotten

This method was used for many hundreds of years, from the time of the ancient Romans. One reason it is not taught in schools today is a group of people called the Puritans, about four hundred years ago. They were very religious, and they had a great deal to do with the education of children in the English-speaking world. One of them, William Perkins, wrote against the method in England in the 1580s.

The Puritans did not like the idea of making funny pictures, because they did not like things that were funny. And the stranger and more unusual a picture is, the better you will remember it. Nobody can see into the heads of little boys and girls, but you can imagine what kind of pictures they might make in there! The Puritans did not like that at all. They could not see into the children's heads, and they did not want children thinking of strange pictures. And so the method stopped being taught in schools.

But we are teaching it again, because we do not mind if you make funny pictures in your head: strange pictures, weird pictures, unusual pictures. This is good. The stranger and more unusual your pictures are, the easier they will be to remember. And you do not have to tell anybody what they are. They are yours alone.

Check yourself

Now walk through the squares, from 1 to 10. Say the name of each element as you see it: hydrogen, helium, lithium, beryllium, boron, carbon, nitrogen, oxygen, fluorine, neon.

Now go backwards, from 10 to 1. It is just as easy, because you are only walking back through the room.

Now jump about. What is in square 7? What is in square 4? What is in square 10? Go straight to the square, look in it, and you will know.

Which element has atomic number 9? Go to square 9: there is the toothpaste. It is fluorine.

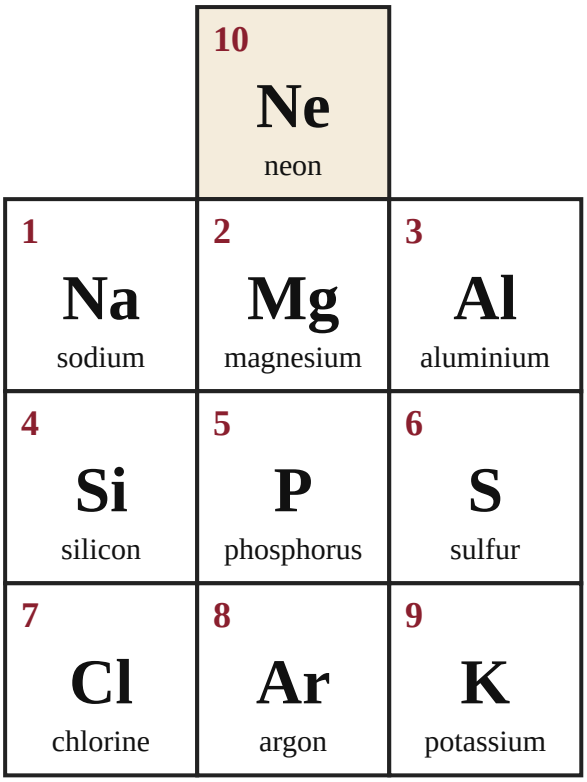
The next nine: 11 to 19

Here are the next nine elements:

Atomic number	Element
11	Sodium
12	Magnesium
13	Aluminium
14	Silicon
15	Phosphorus
16	Sulfur
17	Chlorine
18	Argon
19	Potassium

Elements 11 to 19, in order of atomic number

These go on the first wall, the wall on your left, under the 10 square. Remember how the wall works: turn to face it, and its squares are numbered just like the floor, 1 to 9, starting from the top left-hand corner. Because the 10 is above them, the 1 is really 11, the 2 is really 12, and so on up to 19.



the first wall, on your left

Elements 11 to 19 on the first wall

Turn to face the first wall, on your left. Above you, on the ceiling, the neon sign with the knee is still glowing. Now we fill the wall.

11 — Sodium. Top row, on the left. Notice that the symbol for sodium is Na. This is because in Latin this element is called *natrium*, and so we are going to remember that too. We need to remember that its symbol is not the same as the sound of its English name, *sodium*. There are historical reasons why these are different. So we picture *natrium* with a picture of nature: a tree, with little birds in it, and lots of other natural things around it. That reminds us of nature, and so of natrium. And the tree also has some soda bottles hanging from it, which remind us of sodium. Out in nature, there are some soda bottles: natrium, sodium, Na.

12 — Magnesium. Top row, in the middle, just under the neon sign. *Magnesium* begins like *magnet*. A huge magnet hangs on the wall, pulling knives and forks towards it. Or, because magnesium burns with a bright white light, imagine fireworks and sparklers.

13 — Aluminium. Top row, on the right. Kitchen foil and drinks cans are made of aluminium. Imagine a drinks can, wrapped in shiny kitchen foil.

14 — Silicon. Middle row, on the left. *Silicon* begins like *silly*, and the chips inside computers are made of silicon. So imagine a silly clown, with a computer chip on the end of his nose.

15 — Phosphorus. The very middle of the wall. There is phosphorus on the heads of matches, and *phosphorus* begins a little like *fox*. Imagine a fox striking a match.

16 — Sulfur. Middle row, on the right. We know that sulfur smells like rotten eggs, and the word *sulfur* has the word *fur* in it. So imagine a furry rotten egg. That would be a very strange thing indeed. Nobody knows what it would look like, but you can imagine it: a rotten egg, covered in fur, and smelling terrible. That is sulfur.

17 — Chlorine. Bottom row, on the left. Swimming pools smell of chlorine, and *chlorine* begins like *claw*. Imagine a small swimming pool on the wall, and a big crab's claw coming up out of the water.

18 — Argon. Bottom row, in the middle. *Argon* sounds like *Aragorn*, the hero of *The Lord of the Rings*: Aragorn, son of Arathorn, the wanderer who becomes a king. That is easy to remember. Just make a picture of him in that square. Or, if you do not know the story, imagine a pirate who shouts "Arrr!" and then disappears: he is gone. *Arrr, gone*: argon.

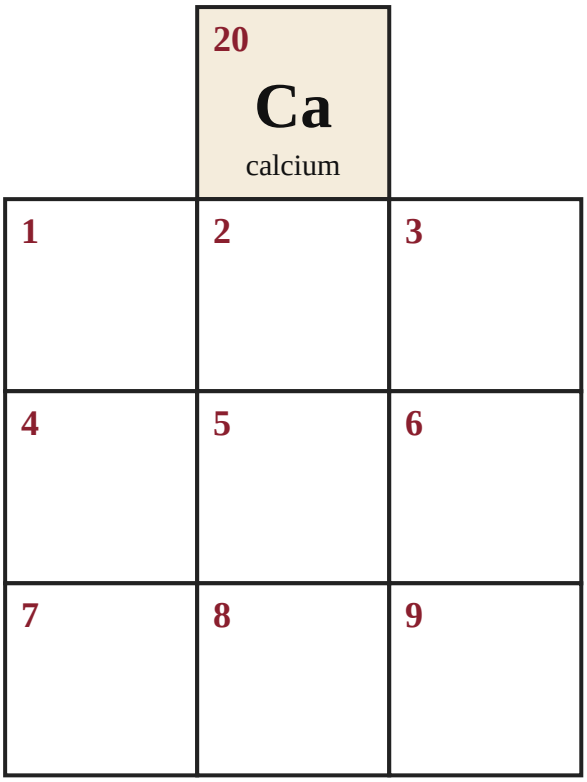
19 — Potassium. Bottom row, on the right. Here is an example of the kind of picture the Puritans did not like boys to make! *Potassium* begins with *pot*. And the bottom that you sit on is also called your *ass*. So you can imagine a person sitting on a pot, and that is your potassium. An *ass* is also a donkey, so you can imagine a donkey sitting on a pot instead. That also gives us potassium. And there is a lot of potassium in bananas. You probably did not know that, but now you do. So perhaps the donkey on the pot is eating a banana.

Now look at the symbol for potassium: it is K. Like sodium, potassium has a Latin name, *kalium*, and the K comes from that. To remember K, we use *kale*. Kale is a kind of cabbage with dark green leaves, eaten by people who like to keep very, very healthy. Kale for kalium.

The history of the word helps too. *Potassium* comes from the word *potash*. In the olden days, people made this chemical by burning leaves in a pot. The ash left over in the pot had potassium in it: pot-ash, potassium. So imagine kale leaves burning in a pot. That reminds you that the symbol K is for kalium, and it connects kalium to potash, and potash to potassium. You can even put the pictures together: the donkey is sitting on a pot in which kale leaves are burning.

Number 20: calcium

Most school chemistry courses ask you to learn the first twenty elements, so we will finish with number 20. It goes in the tens square on the ceiling, above the second wall, the wall in front of you.



the second wall, in front of you

Calcium in the 20 square, above the second wall

20 — Calcium. Look up, above the wall in front of you. There is calcium in milk, and it makes our bones and teeth strong. And *calcium* begins like *calf*, a young cow. So imagine a calf up there on the ceiling, drinking a big bucket of milk. Or imagine a skeleton, with big strong bones, drinking a glass of milk. Here is another way: Superman's real name, from his home planet Krypton, is Kal-El, and *Kal* sounds like the start of *calcium*. So imagine Superman flying across the ceiling above the wall in front of you. But instead of kryptonite, he is carrying calcium: a big glass of milk.

Check yourself again

Now walk through the whole room so far, from 1 to 20: across the floor, up to the neon sign on the ceiling, along the first wall, and then up to the calf above the wall in front of you. Then go backwards, from

20 to 1. Then jump about: what is in square 15? What is in square 12? Which element has atomic number 17? And which is number 20?

You now know the first twenty elements of the periodic table, in order, and you can find any one of them in a moment. If you want to go on, there is plenty of room: the second wall holds 21 to 29, the third wall 31 to 39, and so on, and the room has fifty squares in all.

More rooms: a memory palace

When you have learnt the first fifty elements, your room is full. Then open a door in the room, or just walk through the wall, as if by magic, into the next room. The next room holds 51 to 100, numbered in just the same way.

The next room can be any room you like. It could be a room in your house. It could be a classroom in your school. It could be a completely imaginary room that you make up. What matters is that you always go from one room to the next in the same order.

And if you make up lots of rooms, one after another, you can build something called a memory palace: a whole building in your mind, full of rooms, and every room full of things that you have learnt.

Part Five: Remembering a poem with the memory palace

One line in each square

In the Introduction we said that you can use the memory room to learn a long poem. Now we will do it together.

The method is simple. Each line of the poem goes into one square of the room, in order: the first line in square 1, the second line in square 2, and so on. For each line you make a picture, or you simply put the words of the line in the square. When you want to say the poem, you walk through the squares, one by one, and each square gives you back its line. And because every square has a number, you will also know that line 9 is in square 9, and you can start the poem from any line you like, or even say it backwards.

The poem

Here is the poem we will learn. It is a sonnet by William Shakespeare, written more than four hundred years ago. A sonnet is a poem of fourteen lines, so it will fill the floor of your room (squares 1 to 9), the 10 square on the ceiling, and the first four squares of the first wall (11 to 14).

Sonnet 18

Shall I compare thee to a summer's day?
Thou art more lovely and more temperate:
Rough winds do shake the darling buds of May,
And summer's lease hath all too short a date;
Sometime too hot the eye of heaven shines,
And often is his gold complexion dimm'd;

And every fair from fair sometime declines,
By chance or nature's changing course untrimm'd;
But thy eternal summer shall not fade,
Nor lose possession of that fair thou ow'st;
Nor shall Death brag thou wander'st in his shade,
When in eternal lines to time thou grow'st:
So long as men can breathe or eyes can see,
So long lives this, and this gives life to thee.

William Shakespeare

Some old words

Shakespeare wrote in an older kind of English. Here are the old words in this poem, and what they mean:

- *thee*, *thou*: you
- *thy*: your
- *art*: are (*thou art*: you are)
- *hath*: has
- *temperate*: calm and mild, never too hot and never too cold
- *lease*: the time you are allowed to keep something, as when you rent a house
- *the eye of heaven*: the sun
- *fair*: a beautiful thing; beauty
- *untrimm'd*: stripped of its beauty
- *thou ow'st*: you own, you have
- *thou wander'st*: you wander
- *thou grow'st*: you grow
- *this*: this poem

Hooks, not the whole poem

When we memorise a poem, we do not have to put the entire poem into the room. What we need is a hook: something that hooks each line of the poem to a square of the memory room. We do not need to make detailed pictures for every single word, because the poem rhymes, and it has its own shape and rhythm. Your mind only needs the hooks to hang the lines of the poem on.

So for each line, find the most important word, or the word that is easiest to picture, and make a picture of that. Then put the picture in the square. Here are our suggestions. They are only suggestions: you can change the pictures and make your own.

Line by line

Sit in your room, in your usual place, in square 8.

Square 1 — "Shall I compare thee to a summer's day?" The most important thing here is *a summer's day*. So make a picture of that: a lovely summer's day, with the sun shining and the birds singing. It goes in square 1, on the floor, far away on the left.

Square 2 — "Thou art more lovely and more temperate:" Let us remember the word *temperate*. It reminds us of *temperature*, and so of a thermometer. Put a thermometer in square 2, and the thermometer is admiring itself in a mirror: such a lovely thermometer.

Square 3 — "Rough winds do shake the darling buds of May," Put a storm here, with heavy winds blowing. The darling buds, the flowers, are blowing off the trees in the springtime month of May.

Square 4 — "And summer's lease hath all too short a date;" That is simple: put a calendar in square 4.

Square 5 — "Sometime too hot the eye of heaven shines," In this square, put an eye, and it is hot: a burning hot eye, like the eye of the devil.

Square 6 — "And often is his gold complexion dimm'd;" Put some gold here. Perhaps a sleepy gold eye, half closed, its light growing dim.

Square 7 — "And every fair from fair sometime declines," *Fair* sounds like a *fair*, a fun fair. So put a Ferris wheel and some fair rides here. And the ride is going down, because it is declining.

Square 8 — "By chance or nature's changing course untrimm'd;" This is the square you sit in. Imagine a river changing its course: a winding stream, running round you.

Square 9 — "But thy eternal summer shall not fade," Here we can use the picture we had for summer before, in square 1. But this time it is fading out slowly, as at the end of a film. Perhaps put an hourglass there too, the glass with sand running through it, which is a sign of time running out.

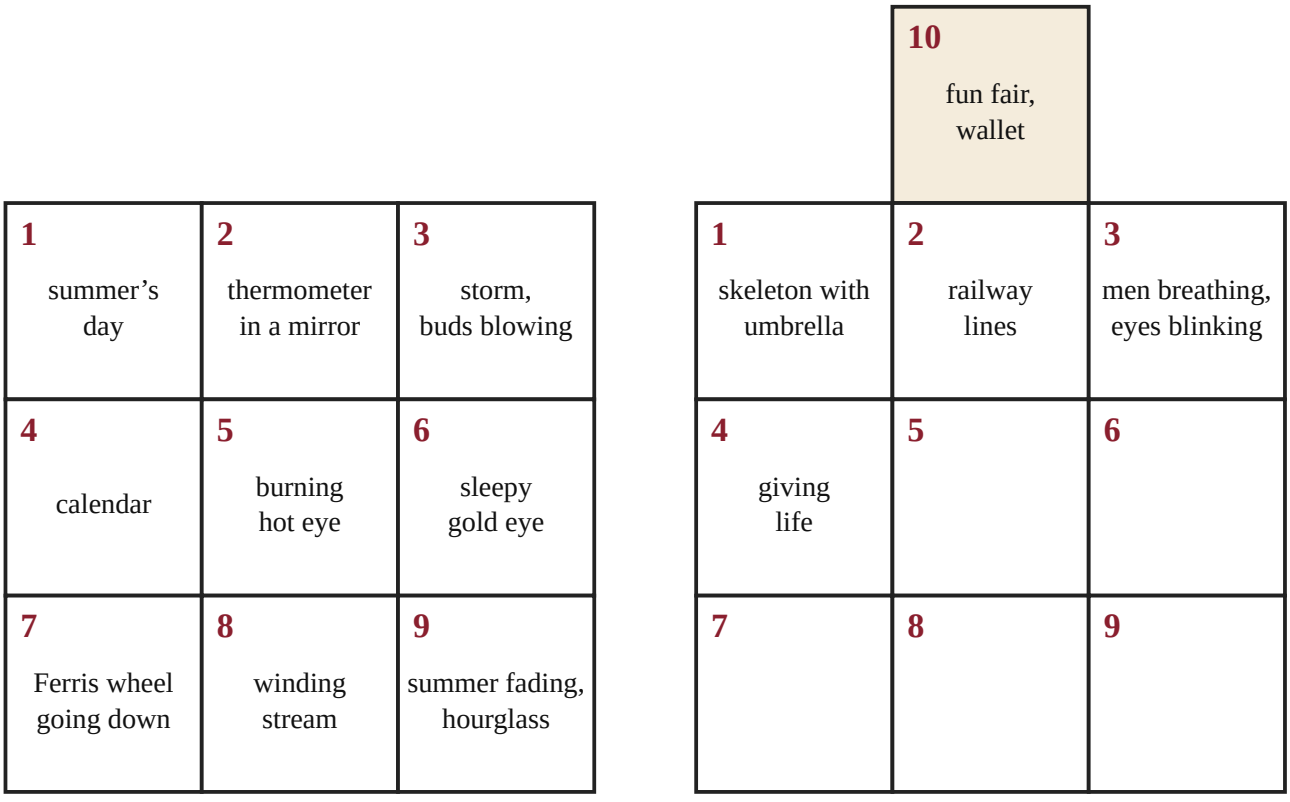
Square 10 — "Nor lose possession of that fair thou ow'st;" This square is on the ceiling, above the first wall. A *possession* is something that you own, so imagine something of yours up there, such as your wallet or your bank card. And we have the *fair* again, so put the fun fair there too, with its Ferris wheel and rides.

Square 11 — "Nor shall Death brag thou wander'st in his shade," Now turn to the first wall, on your left: top row, on the left. Here we put a symbol of death: a skeleton, holding an umbrella to make some shade.

Square 12 — "When in eternal lines to time thou grow'st:" Top row, in the middle. Put railway tracks here: eternal lines, going on into the distance.

Square 13 — "So long as men can breathe or eyes can see," Top row, on the right. In this square, put some men, breathing deeply, and their eyes are blinking.

Square 14 — "So long lives this, and this gives life to thee." Middle row, on the left. Here, someone is giving something to someone else. They are giving life. How do you picture that? It is up to you, but they are giving it.



the floor: lines 1 to 9 *the first wall: lines 10 to 14*

The hooks for Sonnet 18 in the memory room

Saying the poem

And that is it. You have made a picture for each line. Now walk through the squares, one by one. Look at the picture in each square, and say its line. That is how you remember the poem.

And now you can say the poem backwards, too. Once the pictures are in their squares, you can go to any square, look at its picture, and say the line that belongs to it. Start at square 14 and walk back to square 1. Or jump about: what is line 7? Go to square 7: there is the Ferris wheel going down, *"And every fair from fair sometime declines."* Once every picture is in its square, you can say any line of the poem, in any order.

Try it yourself: a speech

The same method works for a speech. In the old days, people took pride in being able to give a long speech from memory. The Roman orator Cicero, and many other famous Romans, would speak for hours, and they used this system, or one very like it, to remember the main points of their speeches. The Greeks called each of these places a *topos*, which is where our word *topic* comes from. In Latin a place is a *locus*, and so in scientific books this way of remembering is called the *method of loci*, the method of places.

Here is a speech for you to try by yourself. It is the last paragraph of the Gettysburg Address, which Abraham Lincoln, the President of the United States, gave on 19 November 1863, during the American Civil War, at the opening of a cemetery for the soldiers who died in the battle of Gettysburg.

> But, in a larger sense, we can not dedicate—we can not consecrate—we can not hallow—this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our poor power to add or detract. The world will little

note, nor long remember what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us— that from these honored dead we take increased devotion to that cause for which they gave the last full measure of devotion— that we here highly resolve that these dead shall not have died in vain— that this nation, under God, shall have a new birth of freedom— and that government of the people, by the people, for the people, shall not perish from the earth.

Abraham Lincoln

Some difficult words

- *dedicate*: to give something to a special purpose, or in honour of someone
- *consecrate*, *hallow*: to make holy
- *detract*: to take away
- *will little note*: will hardly notice
- *devotion*: great love and loyalty for something
- *the last full measure of devotion*: everything they had, even their lives
- *resolve*: to decide firmly
- *in vain*: for nothing, without any result
- *perish*: to die, to come to an end

How to divide it

This speech is quite difficult, because its ideas are abstract: they are not easy to turn into pictures. So you will need more squares than you might think. Break each sentence into two or three parts, and give each part its own square. Here is one way to divide it, into twenty parts. The first part has a picture to start you off. The rest is work for you to do yourself: find a hook for each part, and put it in its square. You can also divide the speech in your own way: sometimes a whole sentence in one square, sometimes a smaller part.

1. But, in a larger sense, we can not dedicate—we can not consecrate—we can not hallow—this ground. *(Picture: a priest dedicating a church, with a big red X on it.)*
2. The brave men, living and dead, who struggled here, have consecrated it,
3. far above our poor power to add or detract.
4. The world will little note,
5. nor long remember what we say here,
6. but it can never forget what they did here.
7. It is for us the living, rather,
8. to be dedicated here
9. to the unfinished work
10. which they who fought here have thus far so nobly advanced.
11. It is rather for us to be here dedicated
12. to the great task remaining before us—
13. that from these honored dead we take increased devotion
14. to that cause for which they gave the last full measure of devotion —
15. that we here highly resolve

16. that these dead shall not have died in vain—
17. that this nation, under God,
18. shall have a new birth of freedom—
19. and that government of the people, by the people, for the people,
20. shall not perish from the earth.

Twenty parts fill the floor (1 to 9), the 10 square on the ceiling, the first wall (11 to 19), and the 20 square on the ceiling above the wall in front of you.