

Let's think about...

Working Memory

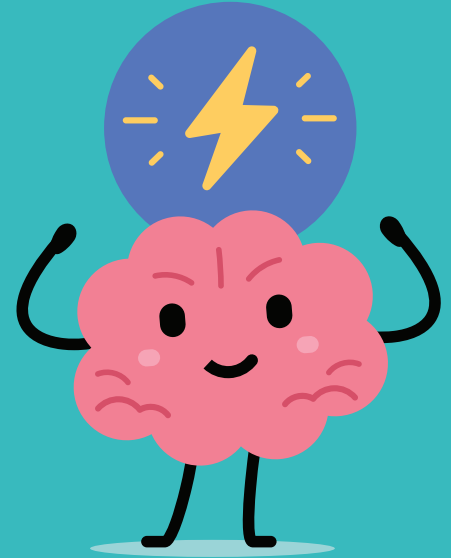
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What is working memory?

Working memory is our brain's way of dealing with information. We have a certain amount of time (usually less than 30 seconds) to manipulate the information before we either forget it or move it to our longer-term memory.

It may be thought of as a control centre and context is everything. For example, if you are an avid football fan, you will hold onto more facts about a game than someone has no interest, but who just happens to be watching. Exposure to the topic will expand the 'window' of your memory to process more.

We use our working memory all the time, especially when listening, speaking, reading and writing. It is thought to be a better indicator of learning/academic potential, than, for example, a high IQ.

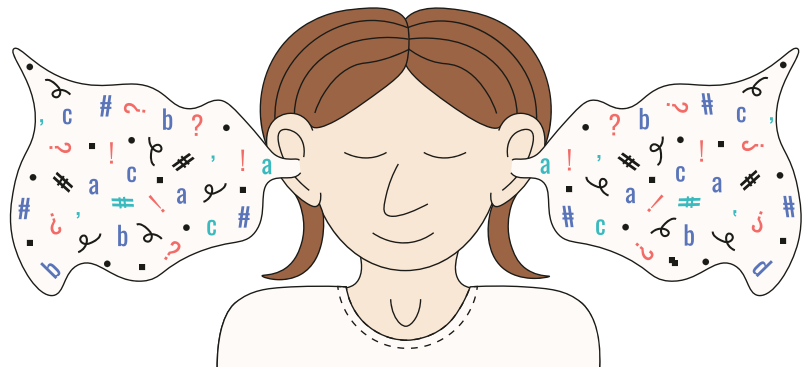


What are signs of a poor working memory?

Many children with poor working memory may have difficulty with:

- ✓ Following instructions with multiple steps
- ✓ Retaining facts and information
- ✓ Remembering names or faces shortly after being introduced
- ✓ Recalling information needed to do an activity or to answer a question
- ✓ Mental maths calculations
- ✓ Time-management, organisation and self-monitoring
- ✓ Retaining engagement in class or group activities
- ✓ Consistency. Performance of memory-based tasks can vary from day to day

Difficulties with working memory can play a part in learning disabilities such as ADHD, dyslexia, dysgraphia and dyscalculia.



"It goes in one ear and out the other!"



Can working memory be improved?

Yes, there are ways to improve working memory.

Here are a few ideas. Different approaches will work better than others depending on the individual. Some activities will 'exercise' the brain, while others are more about finding effective coping strategies.

1. Create routines

There should be routines at home and school. The starting point will depend on the child, but for example, the morning routine could be broken down into steps to be followed daily.

These could be in pictures, personalised to suit. For example:



Once children are at school, the start of the day can be especially tricky.

Children might need to: *Line up in a certain place - Self-register - Put their book bag away - Hand in homework - Put their lunchbox on a trolley - Take their coat off - Sort out a PE bag - Fill their water bottle - Hand in any communications from home - Sit on the carpet - and so on...*

All of this can be very difficult to navigate. Again, a personal check list with photographs/images (of themselves doing the activities if possible) can be very helpful until the routines become properly embedded into the memory.

2. Play memory games

These two games are oldies, but goodies!

Kim's Game

Use real objects. Place a few objects on a tray. The child must be able to name them. For example, do not use a toy hippopotamus, if the child cannot say what it is called. (On the other hand, more unusual items, if the child knows the vocabulary, can be good for the memory.)

Begin with a small number; perhaps 4 - 6. Ask the child to look at the tray for several seconds, then cover it up. Can they remember all the objects and name them?

This is a simple game to vary in terms of difficulty.

To add an element of challenge, you might:

- Add more objects.
- Ask the child to remember more detail, e.g. not just a car, but a purple car.
- Ask the child to remember the positions.
- Have doubles of whatever is on the tray and ask children to replicate it.
- If matching, add a couple of 'dummy' objects.



Pelmanism

This simple matching game is perfect to help children practice holding information in their heads.

You will need pairs of cards. Begin with pictures. In this game, it doesn't matter whether they can name the objects; it is about visualising and pairing. Obviously, talking about the cards and learning new vocabulary is a bonus!

Put all the cards face down and ask the child to turn 2 of them over. Are they a pair? If so, they keep them. If not, they go back in the same places. To help locate the cards, it is easiest if they are in rows and columns.

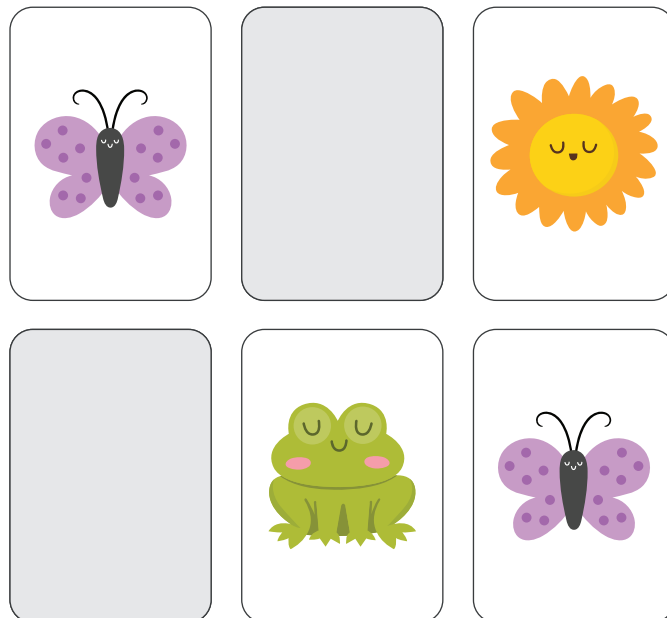
The difficulty can be increased by:

- Adding more pairs
- Making the pairs more similar
- Not having the cards set out in pattern

The difficulty can be decreased by:

- Having less cards
- Making the pictures something children are interested in/know a lot about.

The idea is that the games are challenging, but it is also important for the child to be as successful as possible and to come up with their own strategies. There are, of course, many memory games children can enjoy online if appropriate.



3. Practice Chunking

Breaking tasks into small, manageable steps is an invaluable strategy for making things seem less overwhelming and will often improve focus for children with working memory difficulties.

Use a checklist to set the mini-tasks and help them to feel more successful and motivated. If there can be a small reward at the end of each part they accomplish, so much the better; even something as small as a sticker can help to keep up the interest.



4. Use visual and aural reminders

Write any questions or prompts on the board (or an individual white board), so children don't need to hold them in their working memory, freeing up space.

Recordable prompts, such as Talking Tins, can be useful too. The teacher or child can record details about a task and the child can access the correct instructions as often as they like/need.



5. Keep calm

Try not to get exasperated by children having to have things explained multiple times. They will pick up on how you feel and may avoid asking and do the wrong thing or even use avoidance tactics. Talk to them to find the best ways to help.



6. 'Out of sight out of mind'

Remember that this saying can be very true for some people, especially with a condition such as ADHD. It is also known by the term 'object permanence' – a term coined by Jean Piaget in the 60s. For some people, objects seem not to exist, or are easily forgotten, when they cannot be seen, heard or touched. Choose a consistent spot to place essential items.

7. Exercise

Physical exercise has been proved to have a positive impact on working memory, so getting children up and moving as much as possible can be nothing but good for them. And if movement and learning can be combined – even better!



8. Visualisation

Mind Maps are a very visual way of making sense of and organising thoughts around a particular topic.

They are wonderful for helping to organise thinking and memory.

Begin by writing or drawing the main topic in the centre of the paper and circle it. Use different colours to branch out from the centre to explore the related sub-topics. Children can use pictures or words to describe their thoughts. The Mind Map will be unique and personal to them. Doodling/sketching is another fun way to form associations. This works in a similar way to taking notes. The physical act of writing or drawing can help us to retain information.

N.B. It is worth bearing in mind that some people are unable to visualise in the same way. There is a condition called **aphantasia** in which mental images simply cannot be seen 'in the mind's eye'.



9. Mnemonics

Mnemonics are memory tools that can help us learn or remember information more easily. There are several different kinds:

Musical and Rhyming mnemonics

Songs and rhymes are a great way to learn, and the combination of words and music allows the brain to recall more effectively. Think of the 'A, B, C' alphabet song and how easily that springs to mind – a brilliant way to learn 26 letters in order!

Here are a few examples of helpful rhymes and songs:

January, February,
March, April, May
June, July and August
Are on their way
September and October
Are nearly here
November and December
At the end of the year.

Now it's time for school to end,
Let's get ready with a friend.
Don't forget your coat and bag,
Then your lunch box, don't be sad
Line up at the classroom door
See you tomorrow for some more!
(To the tune of the 'Twinkle, Twinkle')

30 days hath September,
April, June and November
All the rest have 31
Except February, that's the one
With 28 days clear
And 29 in each Leap year.

Days of the week (clap, clap)
Days of the week (clap, clap)
Days of the week, Days of the week
Days of the week (clap, clap)

There's Sunday and there's Monday
There's Tuesday and there's Wednesday
There's Thursday and there's Friday
And then there's Saturday

(To the tune of the 'Addams Family')



Acronym and Spelling mnemonics

Here are a few well known examples of how acronyms can be used to remember chunks of information:

Acronyms

Planets

M y	→	M ercury
V ery	→	V enus
E ducated	→	E arth
M other	→	M ars
J ust	→	J upiter
S erved	→	S aturn
U s	→	U ranus
N achos	→	N eptune

Continents

E at	→	E urope
A n	→	A sia
A pple	→	A frica
A s	→	A ustralia
A	→	A ntartctica
N ice	→	N orth America
S nack	→	S outh America

Colours of the rainbow

R ichard	→	R ed
O f	→	O range
Y ork	→	Y ellow
G ave	→	G reen
B attle	→	B lue
I n	→	I ndigo
V ain	→	V iolet

Directions

N ever	→	N orth
E at	→	E ast
S hredded	→	S outh
W heat	→	W est



Spellings

Here are a few examples of popular spelling mnemonics:

RHYTHM – Rhythm **H**elps **Y**our **T**wo **H**ips **M**ove

BECAUSE – Big **E**lephants **C**an **A**lways **U**nderstand **S**mall Elephants

SAID – Snakes **A**nd Insects **D**ance

PEOPLE – People **E**at **O**melettes, People **L**ike **E**ggs

DOES – Dad **O**nly **E**ats **S**andwiches

COULD WOULD SHOULD – Oh You (**U**) Lucky **D**uck

LAUGH – Laugh **A**nd You (**U**) Get **H**appy

DESERT is Sandy, but **DESSERT** is Sickly **S**weet

COME – Can't **O**pen **M**y **E**yes

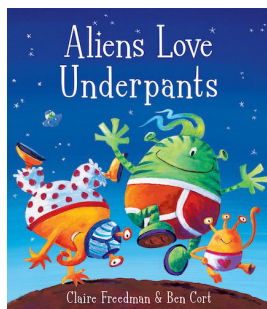
Children could make up their own bespoke mnemonics for specific words they find difficult to spell.

10. Don't forget the other senses!

Remember that when trying to recall details, touch, smell and taste can really help too!

Touch

Extend the concept of a **feely book** by finding items associated with the story you are reading for children to pass around and touch as they listen. This idea can help bring a story to life and make it extra memorable for any age group.

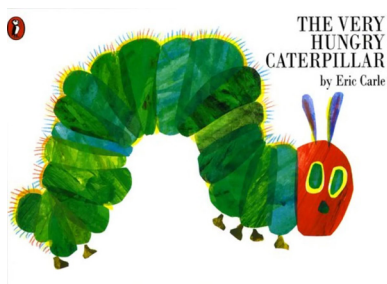


Taste

This is a little more difficult, but certain books will lend themselves to experimentation! For example –

The Very Hungry Caterpillar

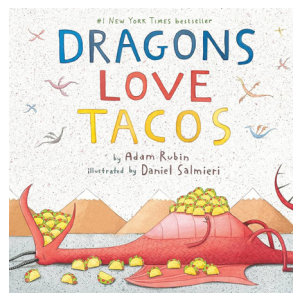
by Eric Carle



Leaf (lettuce) – apple – pear – plums
– strawberries – oranges – choc cake
– ice-cream cone- pickle – Swiss
cheese – salami – lollipop – cherry pie
– sausage – cupcake – watermelon –
green leaf (lettuce!)

Dragons Love Tacos

by Adam Rubin

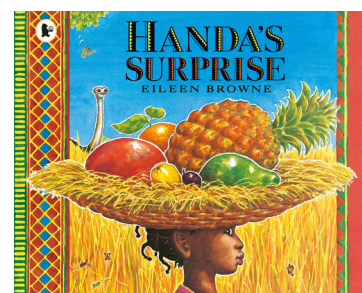


Crispy tacos, lettuce, tomatoes,
cheese, onions, salsa (but never
spicy!)

Have a dragon taco party! Get some
taco shells and get children to fill
them with a selection of ingredients.

Handa's Surprise

by Eileen Browne



Banana, guava, orange, mango,
pineapple, avocado, passion fruit,
tangerines

Taste some more unusual fruits and
perhaps make a fruit salad to go with
this lovely story.

You can probably think of several more books that would fit the tasty theme just as well!

Smell

'Google Nose' was an April Fool's Day prank from 2013 (!) but how brilliant would it be if we really had that technology?

More than 10 years later and it's probably not too far-fetched! Some cinemas already use smell, as part of their 4DX experience and it's easy to imagine how films might be made even more memorable in this way. How about being able to smell the chocolate river from 'Charlie and the Chocolate Factory' perhaps? Or maybe experience the pungency of a spell from any of the 'Harry Potter' films?

There are strong links between scents and memories, often invoking a very emotional response. This is known as 'The Proust Effect' (because French novelist Marcel Proust wrote about it).

There has been research into how scents can affect us in different ways, having, for example, a calming or an uplifting effect. Some educators take this a step further and incorporate appropriate smells into their classrooms using essential oils, diffusers, plants and fruits.

Here are a few examples:



Lavendar and Jasmine

Both these scents are said to have calming qualities to improve emotional state.



Lemon

Said to help with active concentration.

**Have you of Google Nose
– a 15 000 000 data bank of
smells from around the
world?**





Rosemary and Peppermint

Both are said to be useful scents for tasks involving memory.



Cinamon

Is said to stimulate the brain for better focus and attention.



Orange

Has been found to brighten mood and reduce stress and anxiety.

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