How Working Memory Powers Executive Function

Your webinar will begin shortly...
Forgot why you walked into a room?

That is an example of poor working memory.
Think of working memory as your mental workspace, responsible for temporarily storing and manipulating information.
Working memory is defined by MedecineNet.com as a system for temporarily storing and managing the information required to carry out complex tasks such as learning, reasoning and comprehension.

Working memory is part of executive function and is required for planning, problem-solving, and reasoning.
Poor working memory affects your daily life.
No matter what you do, you need your working memory to help you do it.

- You want to join in a conversation, but, by the time the other person stops talking, you forget what you wanted to say.
- You consistently lose your keys, cell phone, or wallet.
- You get lost easily, even when you were just given directions.
- You have trouble following a conversation because you forget what the other person has just said.
- You have many unfinished projects because you become distracted and forget about the first project.
- You plan to do some work at home, but you forget to bring needed items with you.
- You have to reread a paragraph several times to retain the information.
- You miss deadlines at work because of your disorganization and inability to follow through on projects.

Resource: Attitude Magazine
Short Term Memory vs. Working Memory

Working memory is different from short-term memory, where information is temporarily stored and recalled in the same format.

For example, if you give your student a series of numbers such as 1, 5, 6, and 8. Then ask your student to repeat those numbers back to you in the same order.

This is short term memory.

Short Term Memory:
The information is temporarily stored and recalled in the same format.
Short Term Memory vs. Working Memory

However, if you give your student those same numbers and ask them to repeat those numbers backwards.

This is a function of working memory.

Working Memory:
The information is stored, manipulated, and then a response is given.
Test Time!
Set your timer for 20 seconds and try to memorize these items.
What Did You See?

Write down all of the items you remember seeing.
How many items did you remember?

This is an example of short term memory.
Set your timer for 20 seconds and try to memorize these items.
What is Missing?
Write down the items that are missing.
How many missing items did you identify correctly?

This is an example of working memory.
Techniques to help with working memory
Visualization & Mnemonics

Visualization

Visualizing means to create an image of something in your mind. The image gives you a “memory hook” which will improve recall.

Most people remember images and emotions better than verbal or written information.

Mnemonics

A Mnemonic is a device such as a pattern of letters, ideas, or associations that assists in remembering something.

A mnemonic most people are familiar with is Roy G. Biv – the acronym used to remember the colors of the rainbow.
Let’s apply visualization and mnemonics to our memory exercise to see if we can improve!
Visualization

These 5 items are on your tray.

Instead of simply repeating the name of each item over and over, try applying a visualization technique.

Visualize each item in your mind and associate it with a color or feeling. By giving it a color, it is easier to visualize in your mind.
Visualization

Instead of repeating the words to yourself apple, flower, cat, bell, and coffee.

Visualize in your mind:

- bright red apple
- pretty purple flower
- furry orange kitty
- old copper bell
- rich black coffee

When you visualize each item and associate it with a color or feeling, your recall typically will improve.
Practice this visualization technique. Gradually add more items each time.
These 5 items are on your tray.

Instead of simply listing the name of each item in your mind and repeating the name over and over apply a mnemonic technique.

The **story mnemonic** system helps your memory by associating each item with elements of a story. You simply create a simple story around the items you have to memorize.
Mnemonics

These 5 items are on your tray.

Now create a simple story.

“I was walking my cat in a field. I was eating an apple, and I picked a pretty flower. When I heard the bell ring, I know it was time to go home for my cup of coffee.”

Sometimes the sillier the story, the easier the items are to remember!
Practice this mnemonic technique. Gradually add more items each time.
Poor working memory affects academic success.
Dr. Pascale Engel de Abreu, the study’s project leader, found:

- A child’s **working memory** skills, their ability to hold and work with information in mind, predicted success in all aspects of learning, regardless of IQ.
- Most children identified by their teachers as “poor readers” struggled with their working memory.

A study out of the University of Luxembourg reported:

**Working memory** in children is strongly linked to **reading** and **academic achievement**.
Working Memory &
Reading Comprehension

Working memory is key to reading comprehension and reading fluency.

When reading a long sentence, paragraph or passage, working memory is what allows us to hold on to and integrate information we read early on with information that comes later.

Students with strong decoding skills but weak working memories often comment that they “can’t remember anything!” from a page that they just read.

Resource: www.dyslexiaida.org
Working memory plays an essential role in children’s mathematical learning (De Smedt et al., 2009).

Working memory processes allow us to complete even the simple mathematical tasks such as comparing numbers to more complex word problems and equations.
Strategies to help your student (& yourself) with working memory
1. **Work on visualization skills.** “Can you picture what was just read?”

2. **Have your child teach you.** Being able to explain how to do something involves making sense of information and mentally filing it.

3. **Try games that use visual memory.** For example, Concentration, I Spy, or Tic Tac Toe

4. **Play cards.** For example, Crazy Eights, Uno, Go Fish, and War.

5. **Encourage active reading.** Take notes or highlight information.

6. **Chunk information into smaller bites.** Ever wonder why phone numbers have hyphens in them?

7. **Make it multisensory.** For example, walk through the house as you discuss the family chores your child needs to complete.

8. **Help make connections.** Ask your child what they already know about this topic and how the new information can be applied.
So how is your working memory?

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