

## Lesson Plan: Working Memory for Kids

**Grades:** Year 3-6

**Age:** 7-11 years

### Overview

Working memory is the ability to hold information in mind and manipulate it. It is an essential cognitive skill for school learning. This lesson introduces the concept of working memory to children, shows that there is a limit to the capacity of working memory, and introduce strategies to make the most of working memory. The lesson is divided into 4 segments: Introduction, Exploration, Application, and Consolidation.

### Introduction

5 min

<b>Objective</b>	This section is aimed to introduce the concept of working memory – a limited capacity system to store verbal and visuospatial information and manipulate it.
<b>Materials</b>	small white board, marker pen, list of example items
<b>Activity</b>	The teacher introduces the topic to the class following the outline of the 'Introduction' sheet

### Exploration

20 min

<b>Objective</b>	In this section, children will have the opportunity to explore the concept of working memory and to also experiment with their own working memory
<b>Materials</b>	list of example items
<b>Activity</b>	This is a student-lead activity in which children work in small groups. They will be playing a game that requires working memory. This is followed by a short review with the whole class to wrap up the activity.

### Application

15 min

<b>Objective</b>	In this section, children will learn how working memory is used in different classroom and leisure activities. They will also be made aware of signs that working memory is overloaded and strategies to reduce working memory load.
<b>Materials</b>	White-board stickers
<b>Activity</b>	This is a teacher-lead activity. Children are asked to come up with examples of activities that require working memory.

### Consolidation

10 min

<b>Objective</b>	This section aims to recapitulate that information covered in the lesson and condense it to some take-home messages
<b>Materials</b>	Consolidation work sheet
<b>Activity</b>	Students are working individually on the consolidation work sheet, which contains multiple choice questions and text boxes for long-form answers. Students are also asked to reflect on the things that they found most interesting or useful.

## Introduction

### “What is working memory?”

**Note:** *The instructions below provide a guide for teacher on how to introduce the concept of working memory. The text does not have to be used verbatim. The illustrations are intended to be shown on a white board that can be actively manipulated, e.g. by adding an item, adding a tick mark etc.*

Today, we are learning how our brain works, specifically about something called working memory. When we hear the word memory, we often think about remembering things from a long time ago. Working memory is different. Working memory is the type of memory that you use to keep things in mind while you are working on them.

Imagine your Mum asked you to go to the supermarket. Listen carefully and see if you can keep the following instructions in mind:

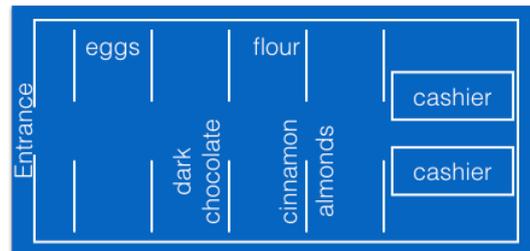
*“Go to the home baking aisle and get some fine white flour, then go to the fridge section and get some free-range eggs, then go to the sweets aisle and get some dark chocolate, then get some almonds from the aisle with the canned fruit, and then get some cinnamon sticks from the spices section.”*

Who can remember the instructions? It’s difficult, isn’t it?

When we keep instructions like this in mind, our brain uses something called working memory. It’s like the brain’s white board: it can take some information to store and manipulate it, like this:

<u>Location - Item</u>
Baking aisle – white flour ✓
Fridge – free-range eggs ✓
Sweets aisle – dark chocolate ✓
Canned fruit aisle – almonds
Spices section – cinnamon sticks

The brain can also use working memory in a different way. For example, like this:



In either case, there is a limit to how much information we can squeeze on this board. It's the same with the brain's working memory. It gets full and things need to be taken off to make room for new information.

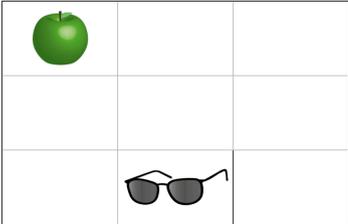
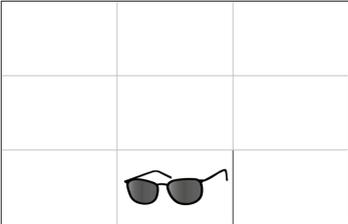
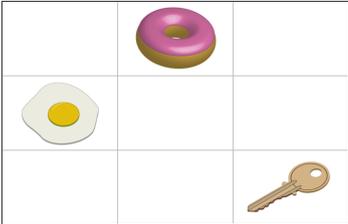
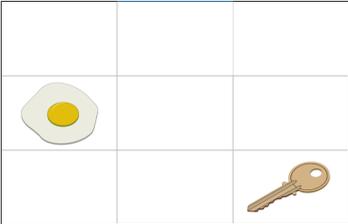
Some people can keep a lot in their mind and others a bit less. The good news is that you get better at this as you grow up and you can use some tricks that help you keep things in mind more easily. We are going to learn about these today

**Working Memory for Kids  
Activity Sheet - Scientist**

Hello, welcome to the Working Memory game. In the first round of the game, you will be the **scientist**. As the scientist, you will **challenge your classmate's working memory**. You will also have to **keep track of how well** your partner is doing.

Follow these instructions carefully:

1. Sit opposite your partner.
2. Put the magnets on the board as shown below. Make sure that your partner cannot see them.
3. Show your partner the board (count to 5) and then turn it away again – use the stop watch
4. Remove items as shown below
5. Show your partner the board again and count to 5.
6. Show your partner the back of the board.
7. She/he will have to say:
  - a. **where on the board** the items were
  - b. if the items that you removed **is food or not**
8. Give your partner a point for each correct location

		Show first	Show second	Place?	Food?
1. S T A R T					
	2.				

← *Fold Here*

*Turn over*

	Show first	Show second	Place?	Food?																		
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**Working Memory for Kids**  
**Activity Sheet - Participant**

Hello, welcome to the Working Memory game. In the first round of the game, you will take part in an experiment. You will have to **remember where you saw** objects on the board and if they are **food or not**.

Follow these instructions carefully:

1. Sit opposite your partner.
2. Your partner will show you object on the board for a short moment. Look at them carefully and remember where you saw the objects
3. Your partner will show you the board again for a few moments. This time one object is missing.
4. Point to the **location of the object that was removed** on the back of the board and say if the missing object was edible or not edible.
5. You will get points for correct answers

## Application

“What do we use working memory for?”

**Note:** *This sheet contains materials for a teacher-lead activity about the use of working memory in the classroom and at home. Children are asked to come up with examples on which situations may require working memory. The teacher will categorise them into activities that are used at home and in the classroom. Some prompts are provided in case children find it difficult to come up with examples. Children should have some time to think about examples on their own and write them down. Every child should have the opportunity to contribute something depending on how much time is available.*

In the last game, we learned that our brain does something called working memory. Working memory is used to store information in our mind and manipulate it like you did in the game.

Now, I want you to think when we might use working memory in school or at home.

Everyone should think of an example of when we might use working memory and write the example down.

*Collect examples from the children on the whiteboard. Summarize specific examples with the templates provided or write additional examples on the whiteboard. Loosely categorise the examples into ‘at school’ and ‘at home’. Make sure that different children contribute something. The examples of activities should have some memory and some processing aspect to them.*

*Example whiteboard:*



When do we need to keep things in mind?	
at school	at home
doing maths	playing a memory game
listening to a story	
following instructions for a crafts project	cooking/baking
reading a book	following the story of a TV show
writing a letter	

*If children find it difficult to come up with examples, try prompts like the following:*

When do you need to keep things in mind during English lessons?

When do you need to keep things in mind in Maths?

In the next step, children will think about signs that indicate that their working memory is overloaded.

*When do these things become really difficult?*

Expected answers: more difficult tasks, e.g. large sums; when there are distractions; when there are a lot of things to keep in mind

Then, children are asked to think of strategies to help them.

*What could you do to make it easier for you to keep things in mind?*

Expected answers: take notes, make a drawing to visualise information, use a chart or table, organize materials before starting an activity, plan what you are going to do before doing it, write instructions down, ask people to repeat what they said when you notice that you forgot something, avoid distractions, do things that require concentration in a quiet area

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## Recapitulation

“What have we learned?”

Please tick the correct box:

Working memory is ....

- keepings things in mind and thinking about them
- remembering what you had for lunch last Thursday
- the reason why we use shopping lists

How many things can we keep in mind at once? Make a cross on the line

one thing \_\_\_\_\_ every word in a book

Give examples of an activity in which you might use working memory:

\_\_\_\_\_

Describe in a sentence what you have learned today:

\_\_\_\_\_

