



This NEPS Handout has been developed by educational psychologists and is based on current knowledge in this area. It is intended as a guide only. Not all the advice here may apply to any one student or situation. Teachers and parents may wish to identify the strategies that will work best for them.

Working Memory in the Classroom

Working memory refers to the ability to hold and manipulate information in the mind over short periods of time. Some examples include following verbal direction, hearing an unfamiliar word in a foreign language and attempting to repeat it several seconds later and remembering a list of ingredients when following a recipe. Poor concentration skills and 'zoning out' can be related to working memory difficulties. If working memory becomes overloaded, critical information about the nature and purpose of a task may be lost. Some research also suggests that working memory is responsive to specific training activities, though the generalising of skills to the classroom context is not yet fully understood. Students who struggle with working memory often have incomplete recall, follow instructions incompletely or in the wrong sequence and lose their place in activities.

Here are some suggestions that you may already be using as well as some additional strategies that you may wish to try out in your classroom:

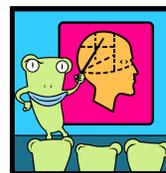
Introducing the Lesson

- Start the lesson by recapping on the main points covered in the previous lesson.
- When introducing a lesson/ new material, try to link it with previous learning, eg. Get students to brainstorm what they know or can remember about the topic from previous learning.
- Ask students to identify features of a task that they have encountered before (when? where? what did they do next? etc.).
- Relate the information being presented to the students' previous experience/ personal knowledge or everyday experiences.
- Use visual prompts or verbal clues to aid recollection. Show students a visual outline of key points/ areas on the board so they know what will be covered in the lesson and revisit this as you progress through the lesson.
- Tell students why they are being taught a particular piece of information so that it makes sense to them.



During the Lesson

- Try to follow a predictable routine so that students will not have to learn new formats for completing work successfully.
- Use as many ways as possible to get the message across e.g. use a notice board/ poster/ diagram/ reminder cards/ personalised memory notebooks/ subject key words/ formula etc
- Give prompts as to what to look out for in a series of directions or presentation e.g. *'Listen to hear how long you must leave the seeds in darkness'*.
- Tell students what you are going to tell them, tell them and then tell them what you have told them.
- Use simplified language where possible, particularly for key phrases and learning points that need to be remembered.
- Make sure that verbal instruction is given at a pace that allows students to make sense of it. When giving an instruction, ask students to repeat/ write the instruction (multi-sensory learning). Check for comprehension and encourage students to ask questions if they do not understand.
- The retention of irregular spelling or facts may be aided by devising mnemonics or 'memorising tricks'. For example, the spelling of the word 'said' might be recalled by the phrase 'swimming alone is dangerous'. Students should be encouraged to make up their own mnemonics.
- Teach students how to chunk information e.g. the routine for the start of the day might be reduced to 'coat, lunch, homework'.
- Highlight or underline the key parts of written information.
- Remember to notice the things that are remembered! Offer praise and recognition.



Finishing Lessons

- A review circle could be used to discuss memory e.g. 'one way/ thing that helps me to remember important things is.....' Students will develop awareness of their own preferred strategies, which can then be reinforced.
- Allow opportunities for repetition, reflection and revision (through class discussions, asking students to repeat key points, written exercises).
- Encourage students to develop their own memory aids, such as posters, useful spelling, number lines, memory cards
- Provide a summary of key information covered in the lesson. Students can provide or contribute to this. Can be visual and/ or oral.

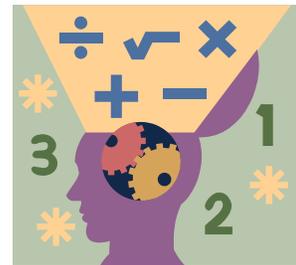


Working Memory

These activities can be used to assess or practice working memory skills. The list could be used to assess a whole class group (upper primary level) and identify those with the greatest level of difficulty. If used to practice skills, adults may need to modify the string of numbers (fewer or more numbers) depending on the student's developmental level.

Say the string of numbers clearly and then ask students to respond to the instruction.

- 3-10-7-4 Tell me the third number
- 6-1-7-2 Tell me the largest number
- 3-2-1-5 Tell me the even number
- 4-9-6-10 Tell me the number between 9 and 10
- 2-4-8-10 Tell me the missing number
- 2-1-4-10 Tell me the odd number
- 9-7-5-3 Tell me the next number in the sequence
- 6-1-9-3 Tell me the last number
- 9-1-7-6 Tell me the first number
- 8-1-6-5 Tell me the second last number
- 6-1-5-2 Tell me the largest number
- 1-2-4-5 Tell me the missing number
- 2-1-4-10 Tell me the odd number
- 4-7-6-1 Tell me the number between 7 and 1
- 2-10-3 Tell me the total of the first and the last numbers
- 5-9-4-8 Tell me the third number
- 4-8-7-5 Tell me the number that came before 7



See also 'Listening Comprehension', and 'Listen, Think, Do' (published by Prim-Ed) and '*Short-term Memory Difficulties in Children*', published by Speechmark, for more specific working memory 'training' activities. Also, *Working memory and learning: A practical guide for teachers*, by Gathercole and Alloway (2008), Sage Publications is a good resource.