Enhanced Learning
Educational Services
"the study skills specialist"

ALL ABOUT YOUR MEMORY

Understanding your memory can help you make informed choices about the most effective ways to approach your learning.

- **You should read each point and highlight the key phrases in that point.**
- **Discuss with a friend or parent as you read through the handout.**
- **You may like to work through this over a number of sessions.**

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Enhanced Learning Educational Services Profile

Our Organisation:
Enhanced Learning Educational Services (ELES) is the leading provider of study skills resources in Australia. Since 2001 over 500,000 students across Australia have benefited from our study skills worksheets and workbooks. An Australian business based in Sydney, our clients extend throughout Australia and to international schools overseas. We are committed to helping all students improve their ability to learn and study by providing study skills seminars and resources on the topics students need.

Our Mission:
To provide a worthwhile and effective service to teachers, students and parents, enhancing students' learning skills and abilities through dynamic programs, resources and strategies to unlock the power of the mind and enable greater success at school and in life.

Our Commitment:
As part of ELES' commitment to education, 5% of all gross income is donated to charities that help and assist children.

For further information about ELES or our products or contact details:

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1. MAKING MEMORIES

Making memories. The memory process is as follows:

- **SENSES:** Information comes in through your senses.
- **SENT:** The info is sent simultaneously to the thalamus for initial processing, to the cortex for further processing in short term memory and to the amygdala to decide what to do with the info long term.
- **EMOTIONAL VALUE:** The amygdala (part of the limbic system deep in the cerebrum) decides if the info is important to you based on the emotions attached to this info. If it seems to be an emergency, the amygdala immediately recruits other parts of the brain to help.
- **EVALUATION:** Based on how the amygdala has reacted about the importance of the info, and what sort of emotional tag it has labeled the memory with, the hippocampus then evaluates the tag and uses this to decide where (and if) to put the information for long-term storage.
- **STORAGE:** If the amygdala tells the hippocampus the info is worth remembering, the hippocampus will send the info back to the cortex (the outer layer of the cerebrum). The hippocampus has to keep track of where it sends the important bits of info so it can retrieve it again if needed. Over time the hippocampus will organise, distribute and connect the memories with the appropriate areas of the cortex for long-term storage. So most of our memories are well distributed throughout the cortex. Basically the hippocampus acts sort of like a switchboard connecting short term memory and long term memory, constantly communicating between the two.
- **ORGANISATION:** Once info has been deemed worth retaining and sent to the cortex by the hippocampus, the job of the cortex is to package the memory into a coherent whole. While the hippocampus might be able to access little pieces, for example, things you have rote learnt, the cortex finds patterns, integrates information and attempts to give structure to information. The frontal cortex organises the information into a chronological and meaningful story.

Think of it like a party. The amygdala are the emotional friends who insist on certain people either being invited or not invited. The hippocampus is the organiser of the guest list, the person that looks at these emotional requests from the amygdala friends and decides who is coming to the party (ie being sent to the cortex so they can be remembered) or who is off the guest list (ie not important info so forgotten). The cortex is the party planner, it's the smart one that will make sure the whole thing comes together.

Retrieving memories:

- **HIPPOCAMPUS:** When you try to remember something, the hippocampus kicks into gear. It is not a storage mechanism remember, it doesn't actually keep the memories, it is a super efficient assembly line that will go out and get the bits needed from the cortex and construct memories as required.

- **SEARCH AND FIND:** So when you try to remember something, the hippocampus goes looking for the pieces in the cortex that it needs to pull the memory together. It can't just go to one part of the cortex that is called "memories" sadly, because memory is not stored in one place.

- **CONSTRUCT MEMORY:** Instead it retrieves info from "convergence zones" all over the brain. Convergence zones are the areas physically near the brain cells (neurons) that first registered the events and most of these are well distributed throughout the cortex. The brain packages up all these bits and pieces to make the memory. So rather than saying that memories are retrieved, it is more accurate to say that memories are re-constructed as needed.

- **LASTING MEMORY:** This pattern of reconstruction is strengthened by repetition to form lasting memories. This is where the phrase "use it or lose it" comes from.

	*a. Can you explain in your own words how we make and retrieve memories?*

2. SHORT AND LONG TERM MEMORY

Sensory filter:

As we go about our day, a large percentage of information processed by our five senses is automatically filtered out. If the information becomes important to you to remember, it has more chance of getting through this filter. And if the information gets through this filter, it will make it into your short term memory.

Short term memory:

- When information first comes in through the senses the frontal lobes hold much of the data in short term memory for around 5-20 seconds before the brain decides what to do with the info (ie before the amygdala and hippocampus kick into gear).

- Short term memory has a limited capacity to handle around 5-7 items of information, for 5-20 seconds.

"If you would like to purchase our 'Memory Strategies Workbook for Students', press 16679346295602881004, followed by the # key."

- Information in short term memory is easily lost (ie. forgotten) due to distractions such as conversation or moving your attention away from the information to something different, such as the song that's just started on the radio.

- Short term memory is like an inbox for the brain before you decide whether to move it to long term memory (which is more like a filing cabinet).
- You may also find it difficult to keep information in your short term memory if you're tired or stressed.
- Short term memory is sometimes called your working memory, because it may hold information temporarily in order to complete a particular task, such as solving a problem.
- Short term memories are stored in the frontal lobe and parietal lobe of the forebrain, or cerebrum.
- Short term memory includes immediate memory and working memory. Immediate memory is like a clipboard where we put info briefly before deciding what to do with it. Working memory is like a work table, a space of limited capacity where we can rework ideas briefly before sending them off for storage.
- In 1956 psychologist George Miller published a paper 'The magical number 7, plus or minus 2'. He showed that working memory can only handle a certain number of items at once. In pre-school you can only deal with about 2 items at once but this increases up to 5-9 items.

Moving info from short term memory to long term memory:

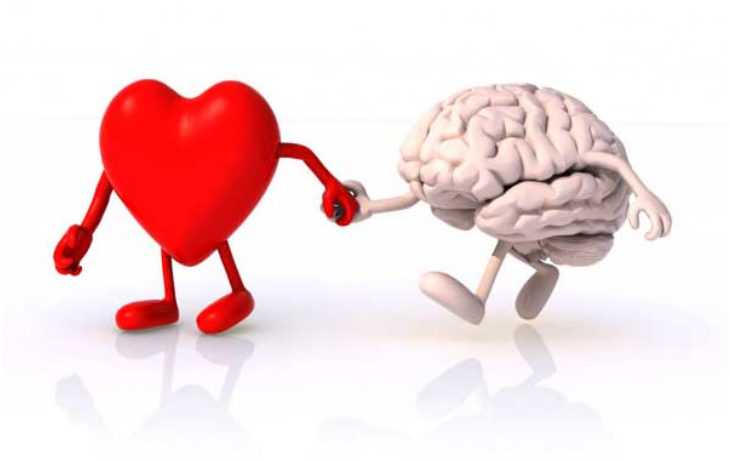
So once the info has made it through the sensory filter of the brain (remember the role of the amygdala and the hippocampus?) and into short term memory then two things can happen.

1. Either you forget the information so it just fades away.
2. Or it is moved to your long term memory.

More on this later, but information is more likely to be moved to your long term memory in the following situations:

- **INTEREST LEVEL:** If you are interested in what you are learning you find it easier to retain the information. Notice how people with a hobby or passion never have any problems remembering every little detail about it, or how subjects you like or are interested in are easier to study for. When you can, try and relate what you are learning to your own personal life.

- **EMOTION:** If the emotion created by the learning experience is strong enough to make an impact on you the brain marks this as important stuff that must not be forgotten so it is pushed to long term memory. That is why anything that generates a strong reaction tends to stay with you. Always try and think about your feelings about what you are learning.



- **ENJOYMENT:** If you are enjoying what you are learning, again the brain flags this as worthwhile stuff.

- **UNUSUAL:** If the information is quirky or unusual, the brain tends to think it is important to retain it.

- **INTENTION:** So what happens if you are doing a subject at school that you aren't really interested in, that doesn't provoke any strong reactions in you and that you don't enjoy? Let's be realistic, not everyone loves every single subject! Well the good news is that despite all of this, if you have a strong intention or desire to remember something it is more likely to become part of your long term memory than to be forgotten. So if you say to yourself 'well I don't like this subject but I still want to get a decent overall mark so I want to do well in it' this is the sort of attitude that will help you retain the information. If you say 'I hate this subject and I don't care', well you are in charge and your brain will take you literally and not bother retaining the information!

So the key thing for you to remember about moving info towards long term memory is: Try and find ways to make what you are learning INTERESTING to you, EMOTIONAL, ENJOYABLE and if you can't do this then at least create the firm INTENTION to remember the information.

