

Memory Strategies and Learning

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Our brains are selective and tend to remember information that forms a memorable pattern. **Memory strategies** help us to organize information into patterns and encourage purposeful learning—some are helpful for **how we learn** information, while others are helpful for **how we recall** information we have already learned.



How Memory Works

Memory is a highly complex process involving multiple components working simultaneously.

In the past, many experts imagined memory as a sort of filing cabinet or a neural computer full of folders in which information is stored away. Today, experts believe memory is far more complex and elusive—and that it is not located in one particular place in the brain, but is instead a brain-wide process.

For instance, if we are riding a bike, the memory of how to operate the bike comes from one set of brain cells, while the memories of how to get to the destination, the safety rules, and the unsettling feeling we get when a car gets dangerously close all come from different sets of brain cells. Yet we are never aware of these separate mental experiences because they all work together so well. In fact, experts say there is no firm distinction between how we remember and how we think.

As we learn and experience the world, more connections in our brain are created. The brain organizes and reorganizes itself in response to our experiences, forming memories triggered by the effects of outside input prompted by experience, education, or training. These changes are reinforced with use so that, as we learn and practise, new information, intricate circuits of knowledge, and memory are built in the brain.

We have a mechanism to filter out and discard irrelevant or unnecessary data; how we pay attention to information may be the most important factor in how much of it we actually remember. This same filtering mechanism organizes relevant data into meaningful patterns.



Training Partner Tools

A memory begins with **perception** (sensory input from our environment) and it is encoded and stored using the language of electricity and chemicals. The registration of information during perception occurs in the brief sensory stage that usually lasts only a fraction of a second. After that first flicker, the sensation is stored in **short-term memory**. Short-term memory has a fairly limited capacity (it can hold about seven items for no more than 20 or 30 seconds at a time). Important information is gradually transferred from short-term memory into **long-term memory**. The more the information is repeated or used, the more likely it is to eventually end up in long-term memory, or to be "retained." Long-term memory can store unlimited amounts of information indefinitely.

Scientists have produced models to help explain how memory works. But so far, none of these models have provided an exact explanation. The illustration below of isolated components is only a simplified representation because, as pointed out earlier, our brains process information in an integrated manner.



Obstacles to Forming Memories

Forgetfulness	 Transience: information not used is lost Absentmindedness: lack of attention during encoding Blocking: retrieval process is unable to happen
Distortion	 4. Misattribution: incorrectly identifying the time, place, or person related to memory 5. Suggestibility: incorporating information suggested by someone else into our memory 6. Bias: current knowledge or needs distort memory of past
Persistence	Traumatic or emotional events may cause memories to persist even when we would like to forget



Memory and the Learning Pyramid

According to James Madison University, the learning pyramid below is a graphical representation of the most effective way of learning and remembering more material.

It depicts the following average learning retention rates:

- Lecture: 5% retention
- Reading: 10% retention
- Audio-Visual: 20% retention
- Demonstration: 30% retention
- Discussion Group: 50% retention
- Practice by Doing: 75% retention
- Teaching Others/Immediate Use of Learning: 90% retention



Obstacles to Forming Memories

Make it Interesting
The brain prioritizes by meaning, value, and relevance. In order to remember
 something, you must be interested in it. Strategies to increase interest in study materials include: Have a study partner Teach an assignment to someone else
 Seek ways to make information personal
Find personal value for the information
Be Intentional
A positive ATTITUDE is a key factor to remembering. Research shows that if information does not get enough attention or if it is not deemed necessary for long-term memory, it will be encoded in short-term memory only and ultimately discarded. Strategies to improve the intent to remember include:
Get enough sleep
Eat a good breakfast
Eliminate distractions
Make Connections
Your understanding of new material will depend on how much of it can be connected to
knowledge you already have. Strategies to form connections include:
Review notes from the day before
 Survey a chapter before reading it Create similar and metaphors from experiences in your own life
Review the reading and/or notes (if available) ahead of time



Control the	Be Selective
Amount	The learner must determine what is most important, and select those parts to begin the
and Form of	process of studying and learning. Strategies for being selective include:
Information	 Pay attention to major headings, bold print, italics
	Read chapter summaries and answer questions at the end of the chapter
	Highlight important parts while reading
	 Pay attention to verbal and nonverbal clues during lectures (e.g., numbering of items, repetition of an idea, things written down on the heard).
	terns, repetition of an idea, timigs written down on the board)
	Make the Information Meaningful
	We can learn and remember better if we group ideas into meaningful categories
	or groups. The brain can only process five to seven bits of information at a time.
	Strategies to make information meaningful include:
	Break an assignment into smaller, manageable steps (task analysis)
	Group information according to shared qualities
	Use mnemonics (something to help you remember such as an acronym, rhyme, ar visual)
Strengthen	Recite the Materials
Neural	This involves saying something out loud in your own words. Recitation triggers the
Connections	intent-to-remember switch and gives immediate feedback. Strategies include:
	Use flash cards
	Teach the information to someone else
	Write down lists over and over
	Recite lists, mnemonics, etc.
	Visualize the Materials
	Make a mental picture of what needs to be remembered. We remember pictures much
	longer than words. Strategies include:
	 Try concept mapping (e.g., flow charts, diagrams)
	Develop graphs, charts, etc.
	Make Associations With Other Information
	Tying new information in with something we already have stored in our long-term
	memory can make new information easier to retrieve and remember. Strategies
	include:
	Create similes, metaphors, analogies
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Allow Time	Reinforce What Was Learned
to Solidify	Our brain must have time for new information to establish a neuronal pathway, much
to Solidity Pathways	 Our brain must have time for new information to establish a neuronal pathway, much like how people walking over the same stretch of grass form a new path over time. Strategies include: Take notes Ask questions Review notes Stop after each paragraph and write a Jeopardy!-style question Spread Out Studying An effective way to remember material is to study over a series of shorter study sessions distributed over several days, rather than fewer and longer study sessions. Strategies include: Use task analysis Avoid cramming at the last minute Practise good time-management skills Review information immediately before or after class for short periods of time

References:

How Human Memory Works, by Richard C. Mohs, PhD How Memory Works, James Madison University

