

# Memory

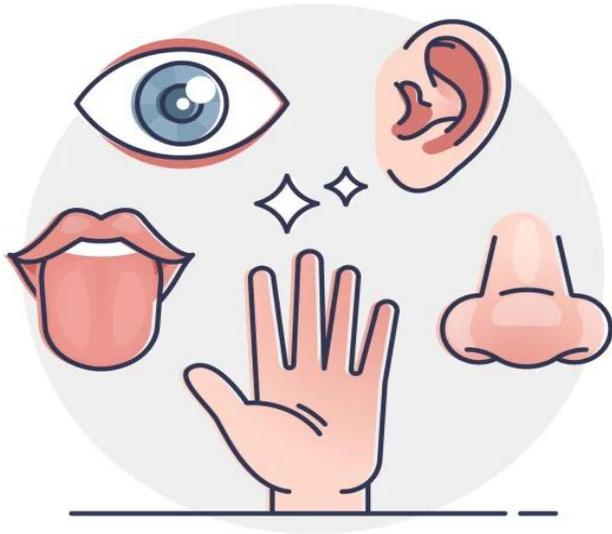
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Professor of Psychiatry

# Definition of Memory



- is the ability to store, retain, and recall information and experiences.
- is the ability to encode, store, retain and subsequently recall information and past experiences in the human brain.

# TYPES OF MEMORY



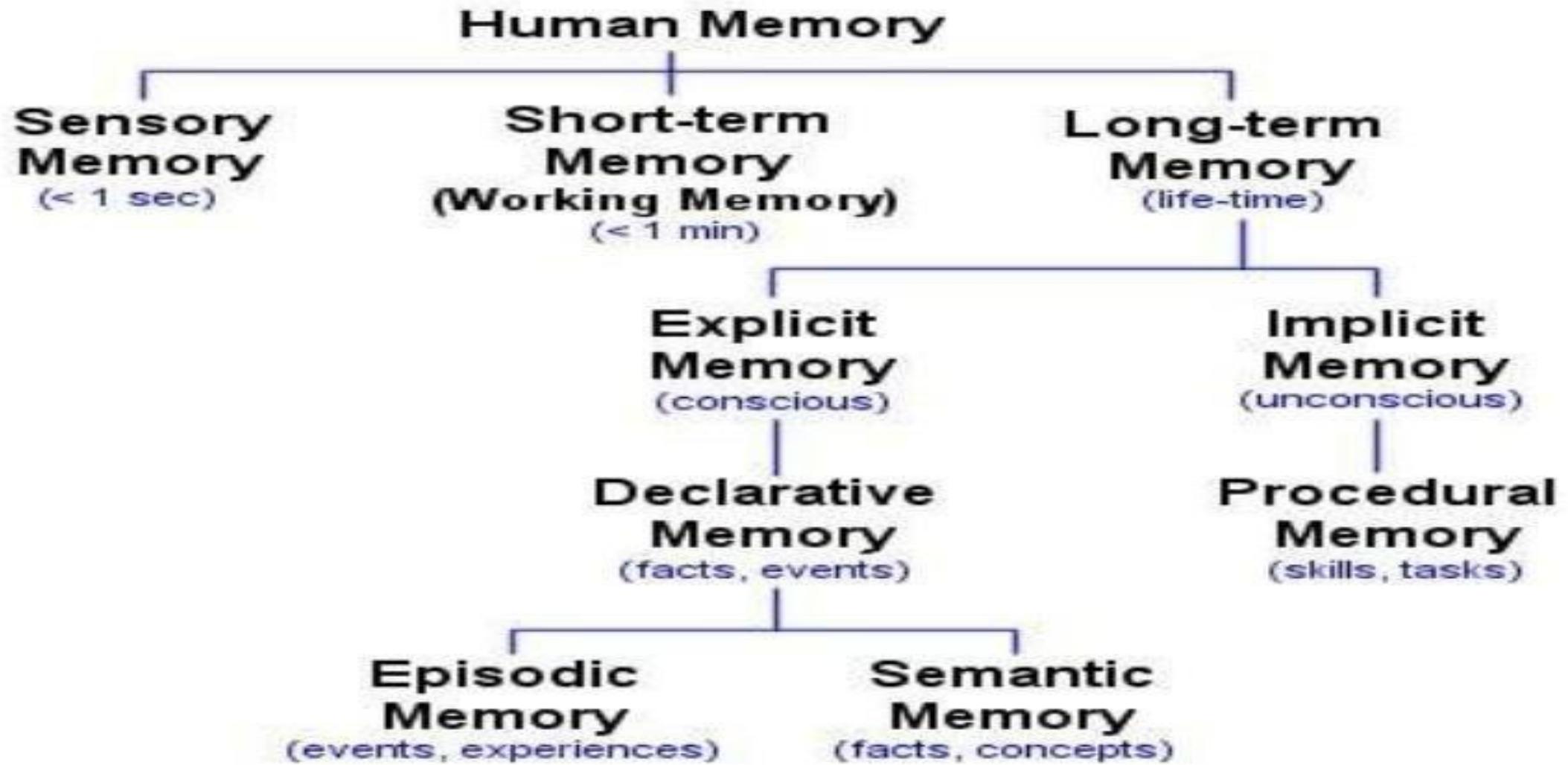
**SENSORY  
MEMORY**



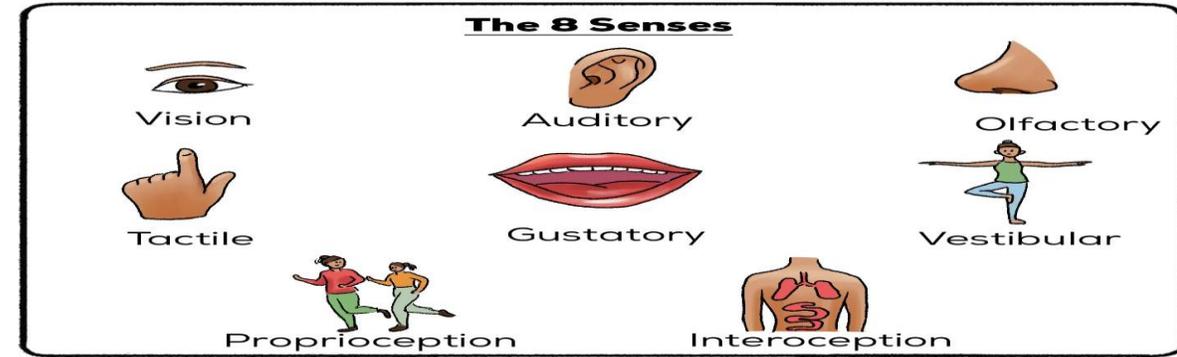
**SHORT-TERM  
MEMORY**



**LONG-TERM  
MEMORY**

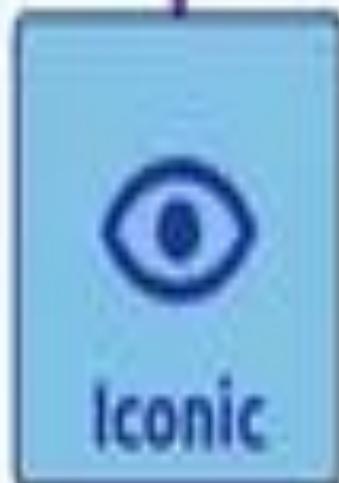


# Sensory memory:



- Sensory memory is the ability to retain impressions of sensory information after the original stimulus has ceased.
- It lasts only for **less than one second**.
- The two types of sensory memory that have been most explored are iconic (visual) memory and echoic (auditory) memory .
- Most of information hold in sensory memory are **lost** because we don't attend to all information registered, we attend only to move it to the next stage of memory.

# Sensory memory

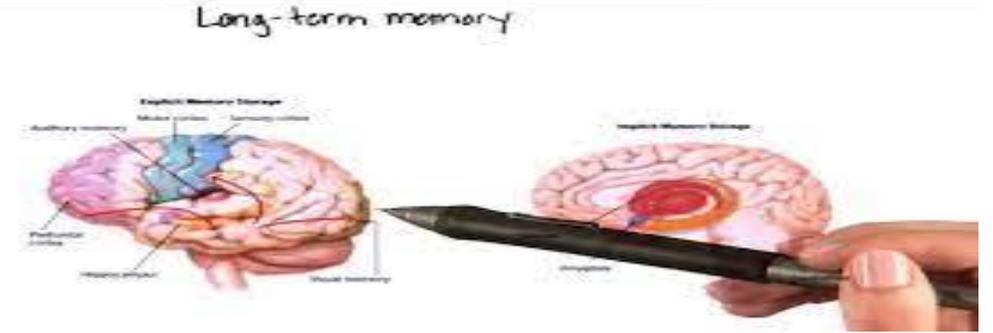


# Short term memory:



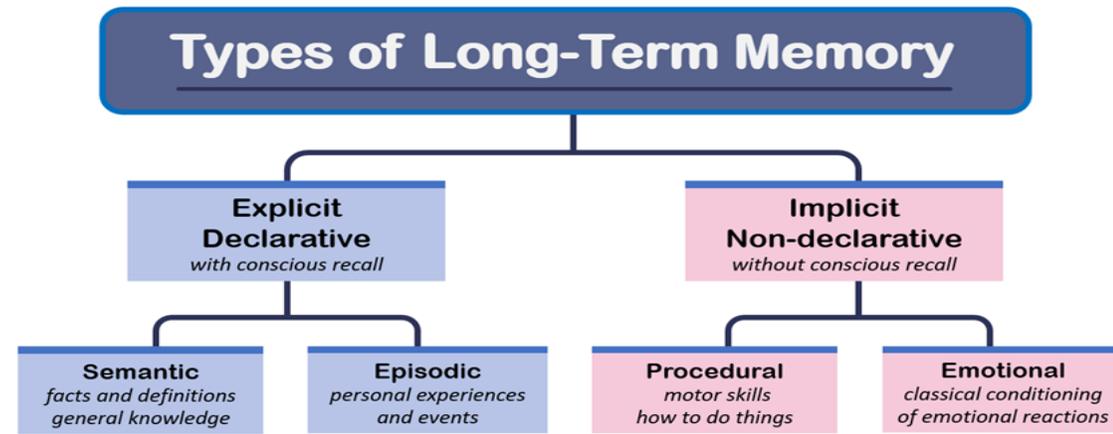
- Also called working memory.
- **Capacity:** only about  $7 \pm 2$  items can be stored at a time.
- **Duration:** for 15-30 seconds.
- **Storage** is very fragile, and information can be lost with distraction or passage of time.
- Items can be kept in short term memory by repeating them verbally( a process known as **rehearsal**), even translating visual information into sounds.

# Long term memory:



- It is the ability to store information for long periods of time (life long). Like phone numbers, addresses and names when we were kids.
- Long term memory can store much larger quantities of information for potentially unlimited duration sometimes for whole life span.

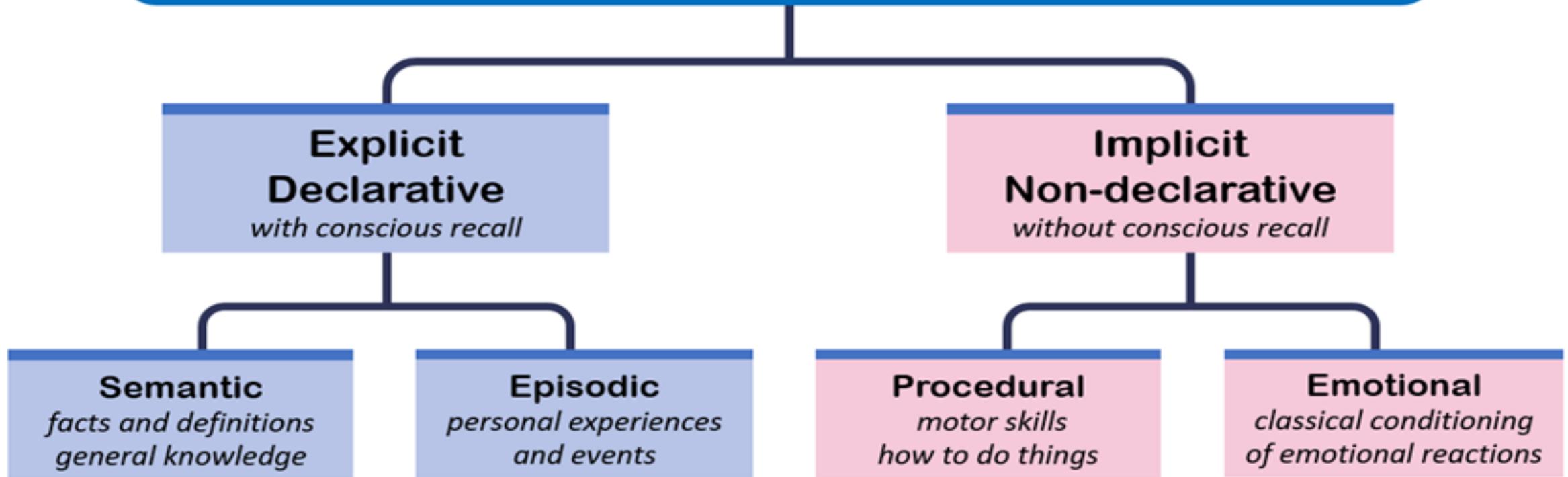
# Long term memory:



(Based on Malmberg et al., 2019)

- Long term memory is divided into:
  - 1. Explicit (declarative) memory.
  - 2. Implicit (procedural) memory.

# Types of Long-Term Memory



(Based on Malmberg et al., 2019)

**Long-term memory**

**Procedural memories**  
("Knowing how")

**Declarative memories**  
("Knowing that")

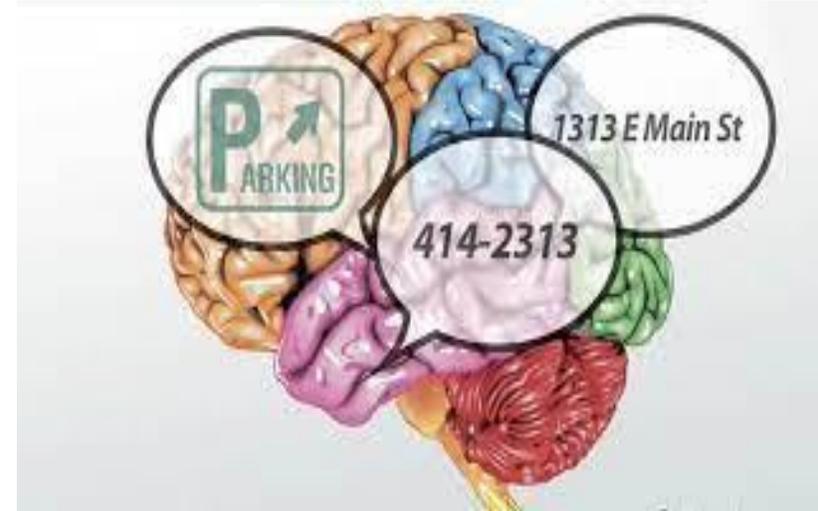


**Semantic memories**  
(General knowledge)

**Episodic memories**  
(Personal recollections)



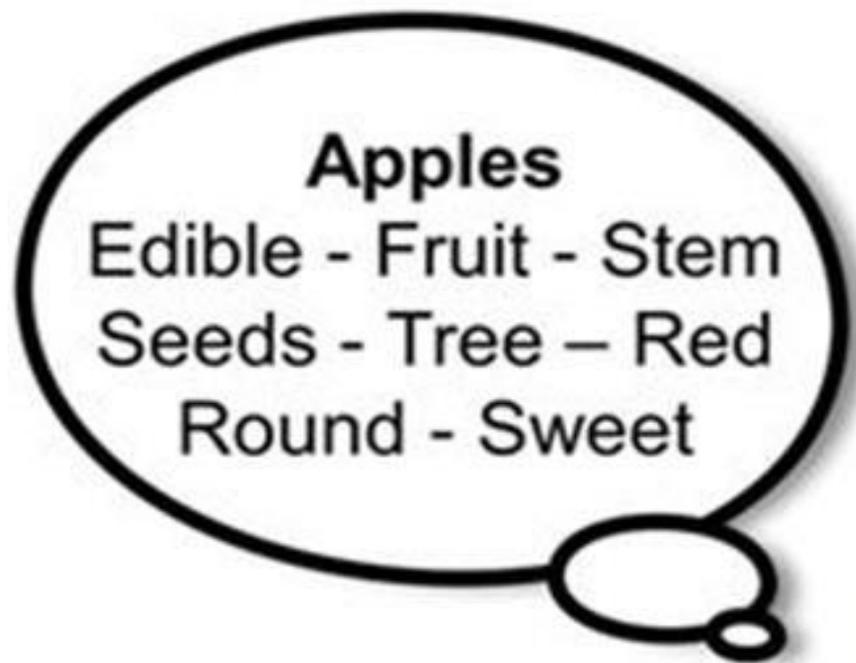
# I. Declarative (explicit) memory:



- It is the memory of facts and events.
- It refers to memory that can be consciously recalled.
- It can be further subdivided into:
  - A. episodic memory.
  - B. Semantic memory.



## Semantic Memory



object knowledge learned  
over many interactions

## Episodic Memory



memory for specific events  
that you have experienced



# Declarative memory:



- **Episodic memory:** represent our memory of experiences and specific events in time in a serial form, from which we can reconstruct the actual events.
- **Personal experiences** are linked with specific times and places.
- **Semantic memory:** is the record of facts, meanings, concepts and knowledge about the external world
- II. **Procedural (implicit) memory:**

## II. Procedural (implicit) memory:

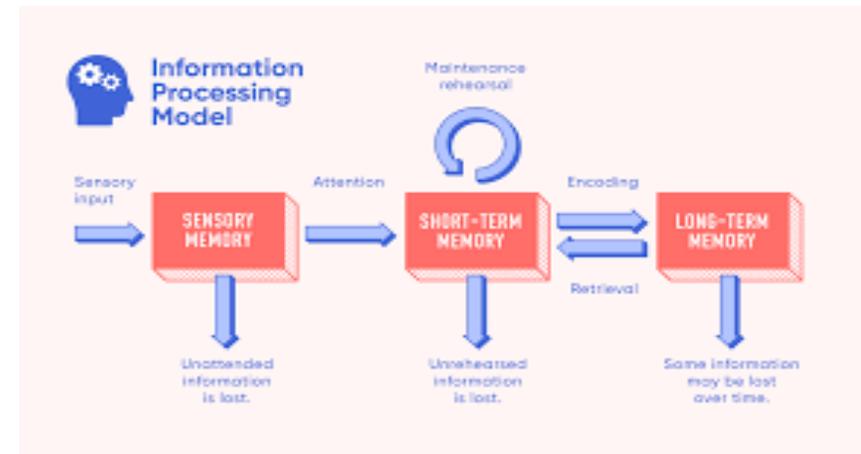
 **IMPLICIT MEMORY**  
Things you remember unconsciously and automatically with repetition. Usually non-verbal memories.  
@THE\_EMDR\_COACH  
Examples:  
Riding a bike, remembering the words to a song, **behaviors that were adaptive and functional during childhood**

- Is the unconscious memory of skills and how to do things, particularly the use of objects or movements of the body e.g. playing Piano or riding a bicycle.

*Implicit Memory*  
*"non-declarative memory"*  
Made up of knowledge based on previous experiences such as skills that we perform automatically once you have mastered them.  
- resides outside of our conscious awareness



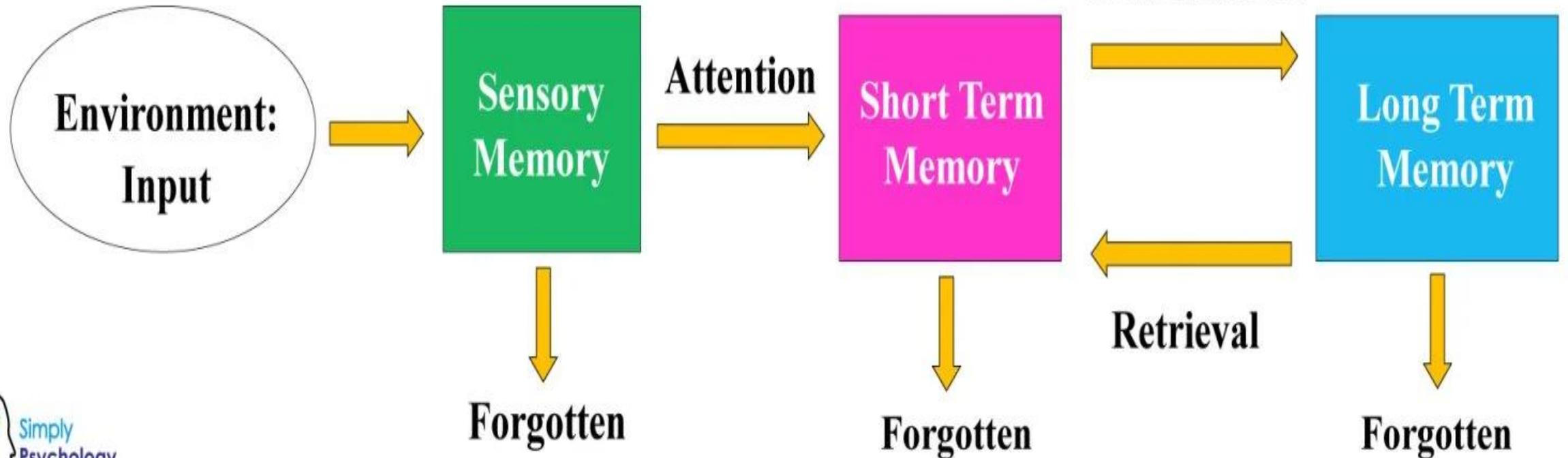
# Information processing model:



- How does memory works?
- **Encoding:** is controlled learning of certain materials with the purpose of retaining them (receiving, processing and combining of received information)
- **Storage:** is the persisting after effort of any learnt material. It is the process of retaining information in the brain whether in sensory, short term or in long term memory.
- **Retrieval:** reactivating and recalling the information for use in a process or activity

# Multi-Store Memory Model

Atkinson and Shiffrin (1968)



## WHAT IS RETRIEVAL?

# Retrieval

*the process of accessing information stored in long-term memory*

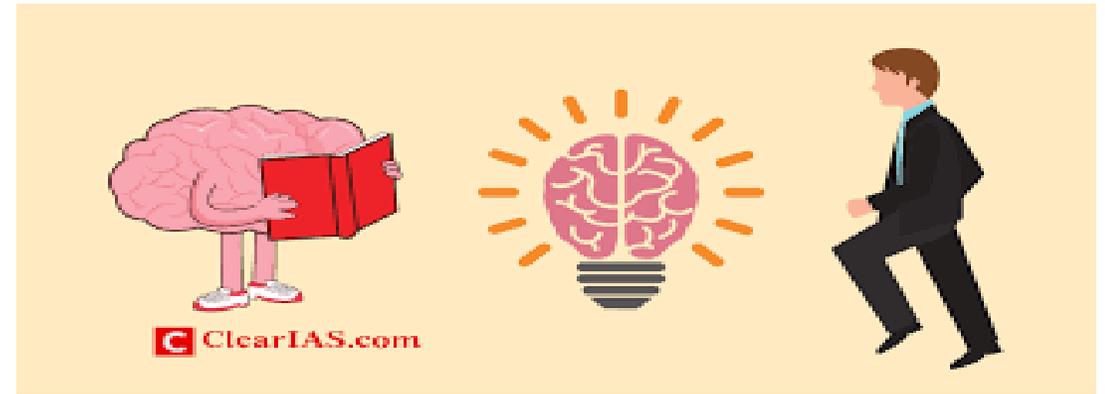




# How to Increase Memory Power in Students



# Economy in memorizing

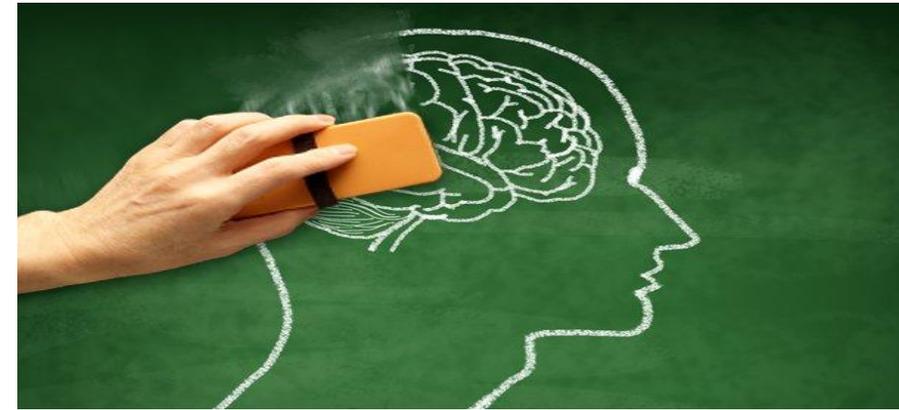


- Factors that help in economizing the time and effort of memorizing and favour efficient learning:
- **Prevention of distraction** whether external or internal.
- **Identification of essential principles** and main points of the subject.
- **Observation of the relation** between parts of the subject and between it and other subjects.
- **Understanding** and digestion of the meaning of the subject to be learned.

# Economy in memorizing

- **Recitation** to oneself economizes time and fixes the lesson for longer time in memory and is superior to passive relearning.
- **Spaced repetition** requires fewer trials than massed repetition.
- Study by the whole method makes memorizing usually faster than by part method.
- **Chunking**: organizing data into manageable units that will be easier to recall than individual numbers or things.
- Example: memorize: 148503851604852  
1485 0385 1604 852
- **Mnemonics**: is a memory trick that connects information to existing memory strengths such as images or maps.

# Forgetting



- It is the gradual loss of a retained material.

**The rate of forgetting varies with:**

- Individual differences.
- The degree of learning.
- The time spent in learning.
- The way of learning.
- The type of material learnt.

**FORGETTING**

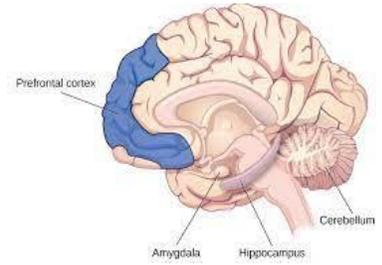
- Forgetting is the loss of the ability to recall or recognize something learned earlier.
- It is the failure of the individual to revive in consciousness an idea or group of ideas without the help of the original stimulus.



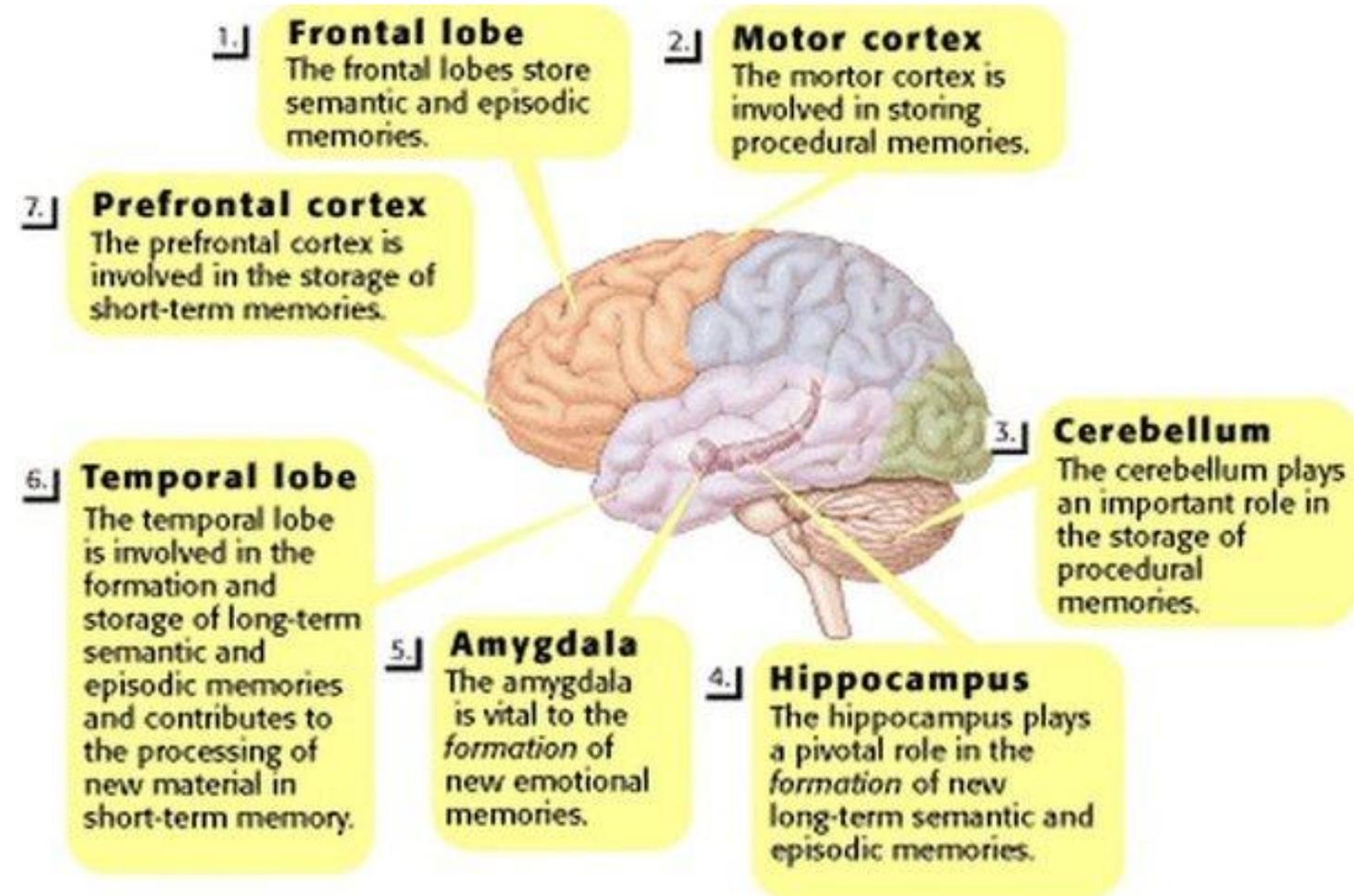
# Forgetting:

- **Causes of forgetting:**
  - 1) **Interference theory:** new learning may disrupt memory traces, and we forget because recently learnt material interfere with what we are trying to remember. Lack of interference is said to be the cause of slower forgetting during sleep than during waking hours.
  - 2) **Repression theory:** repression makes us forget what we are not interested and what we do not want to remember, as it is associated with a **painful memory**.
  - 3) **Disuse atrophy:** memory traces become weaker and atrophied with the passage of time if they are not used, exactly as the muscle which is atrophied if not used for long time.

# Brain areas involved in memory



- Hippocampus.
- Amygdala.
- Mammillary bodies.
- Thalamus.
- Temporal cortex.



# QUIZ

- What is the process of putting information into memory known as?
- a) Retrieval
- b) Storage
- c) Encoding
- d) Repression
- e) Forgetting
  
- **Answer: c) Encoding**

- What type of memory is responsible for storing information about the world and general knowledge?
  - a. Sensory memory
  - b. Short-term memory
  - c. Procedural memory
  - d. Semantic memory
  - e. Episodic memory
  
- **Model Answer: d. Semantic memory**

- Which part of the brain is primarily associated with memory and is involved in forming new memories?
- a. Amygdala
- b. Temporal Lobe
- c. Mammillary Bodies
- d. Medial Frontal Gyrus
- e. Hippocampus
  
- **Model Answer: e. Hippocampus**

*Thank  
you*

