



TEACHING AND LEARNING STRATEGIES - WHAT EVERYONE SHOULD KNOW

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1. TEACHING AND LEARNING



Education is always changing

- Education is constantly evolving. Theories grow as we learn more about learning processes, and new ones emerge. The focus of education is shifting from “teaching” to “learning” today.
- Teacher is the most important ingredient of quality education. Effective teaching strategies include *active learning, cognitive activation and teacher-directed instruction*.
- What is LEARNING STRATEGY? *A strategy used primarily during the process of learning such as forming a mental image of a process.* (Pam, 2016, p. 1, Psychology Dictionary)
- Students must have abilities that enable them to initiate, guide, and control the search for information, as well as its processing and storage. These tactics are known as learning strategies.

Teaching is a Noble Profession

Teaching is a noble but incredibly difficult and demanding profession which comes with great responsibility and duty.

The teacher is the change-maker and can shape the character, capability, and future of his/her student.

The student can remember the teacher as a great mentor or as someone who ruined his/her life.

“The mediocre teacher tells. The good teacher explains. The superior teacher demonstrates. The great teacher inspires.”-William Arthur Ward

Critical competencies that the students should acquire

1 personal responsibility,

2 Ability to act in principled, ethical fashion,

3. Skill in oral and written communication,

4. Interpersonal and team skills,

5. skills in critical thinking and problem-solving,

6. respect for people different from oneself,

7. ability to change,

8. ability and desire for lifelong learning.

- [Gardiner, L., 1994, Redesigning Higher Education: Producing Dramatic Gains in Student learning. ASHE-ERIC Higher Education Report 7, Washington D.C., George Washington University.]

What is learning?

"Learning is any relatively permanent change in the behavior, thoughts, or feelings of an organism that results from experience." -Robert Sternberg, a cognitive scientist.

"Give the pupils something to do, not something to learn; and if the doing is of such a nature as to demand thinking; learning naturally results." -John Dewey in his book -*Democracy and Education*.

What is learning? (continued)

It could be:

- Memorization
- Acquiring facts or procedures
- Understanding reality
- Making sense of the world

The learner's motivation is commonly viewed as the critical requirement for successful learning.

Difference between teaching and learning

It's not important what the teacher covers; rather what the student discovers!

It's not important what teachers do; rather, it is important what students do!

This cartoon emphasizes the difference between teaching and learning!



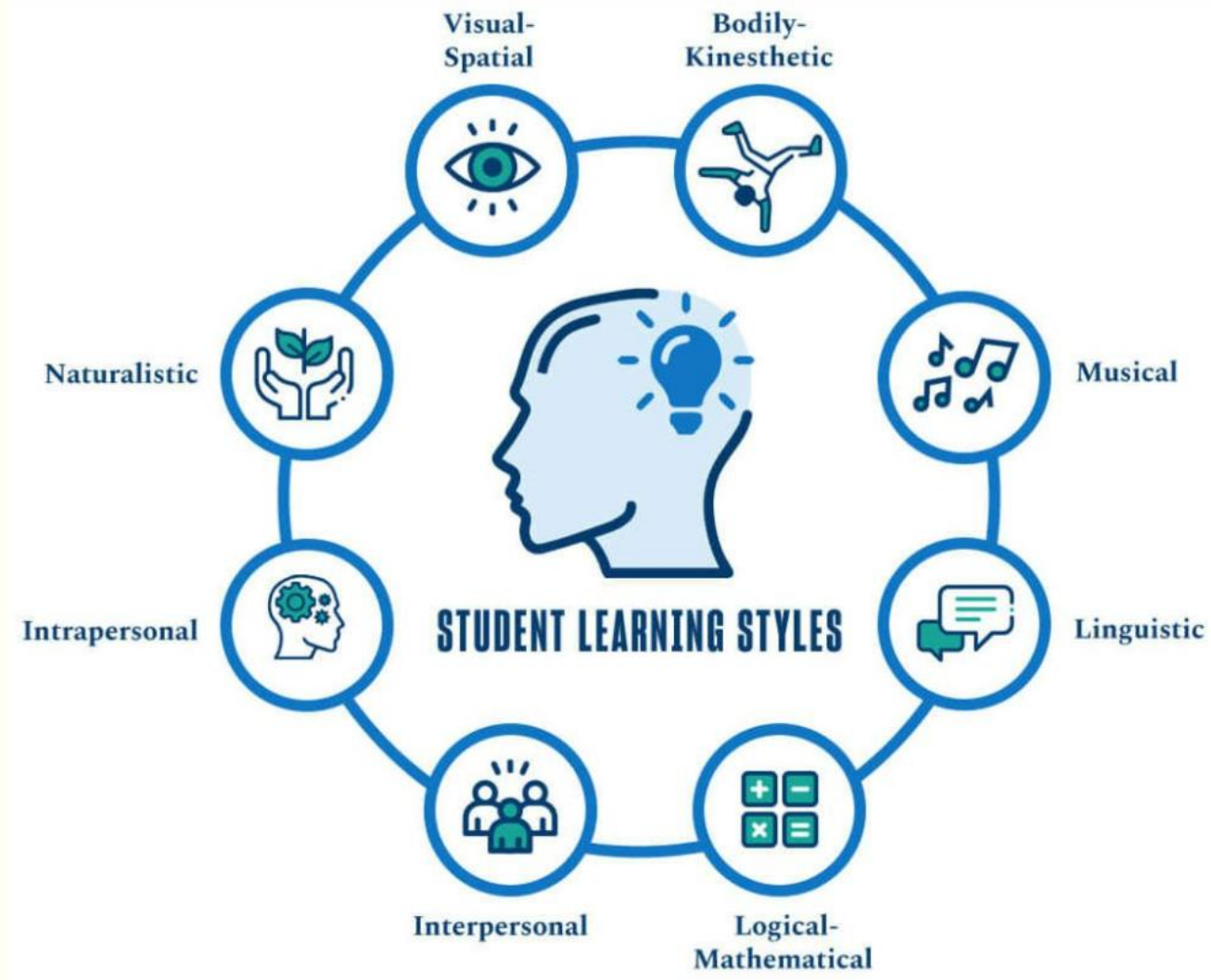
Forms of Learning

Implicit Learning	happens without general awareness of what is being learned and occurring incidentally.
Informal Learning	takes place in different contexts and settings, often spontaneously and usually without a specific curriculum.
Formal Learning	occurs in systematic and intentional way within a structured educational setting.
Explicit Learning	learning that is attended to with conscious focus.

Seven Learning Styles

- Visual: Using sight
- Auditory: Using songs or rhythms
- Verbal: Speaking out loud the information
- Kinesthetic: Using touch and taste to explore the information
- Logical: A more mathematical approach to concepts
- Interpersonal: Learning in groups
- Intrapersonal: Learning alone

Student Learning Styles



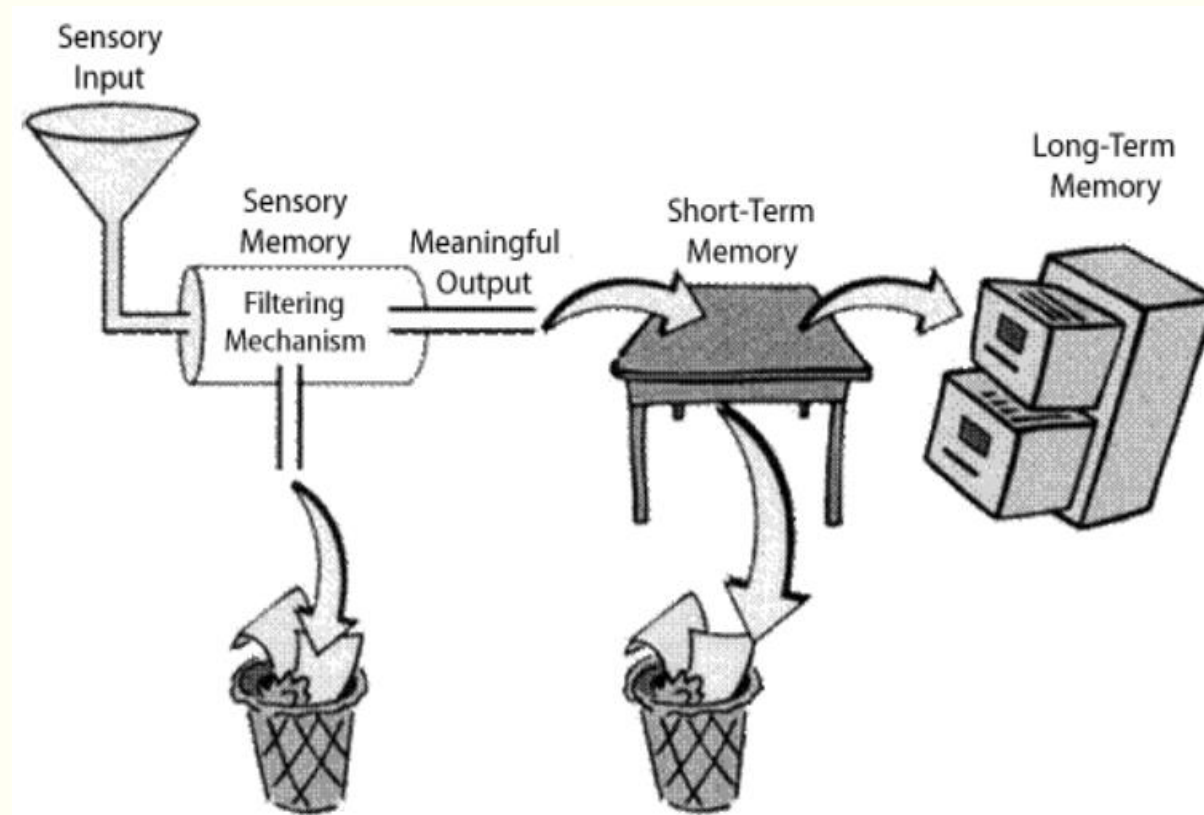


2. HOW DOES OUR MEMORY WORK?



Understanding how memory works

Understanding how memory works, is very important to improve the ability to remember.



Understanding how memory works(cont.)



Sensory input describes the response of our sensory organs (such as eyes, ears, mouth, tongue, skin, etc.)



Incoming sensory information makes its way through the bottleneck (paying attention) and enters our working memory.



It then either begins to be processed in some way (encoding) and enters long-term memory or is lost after a brief period.

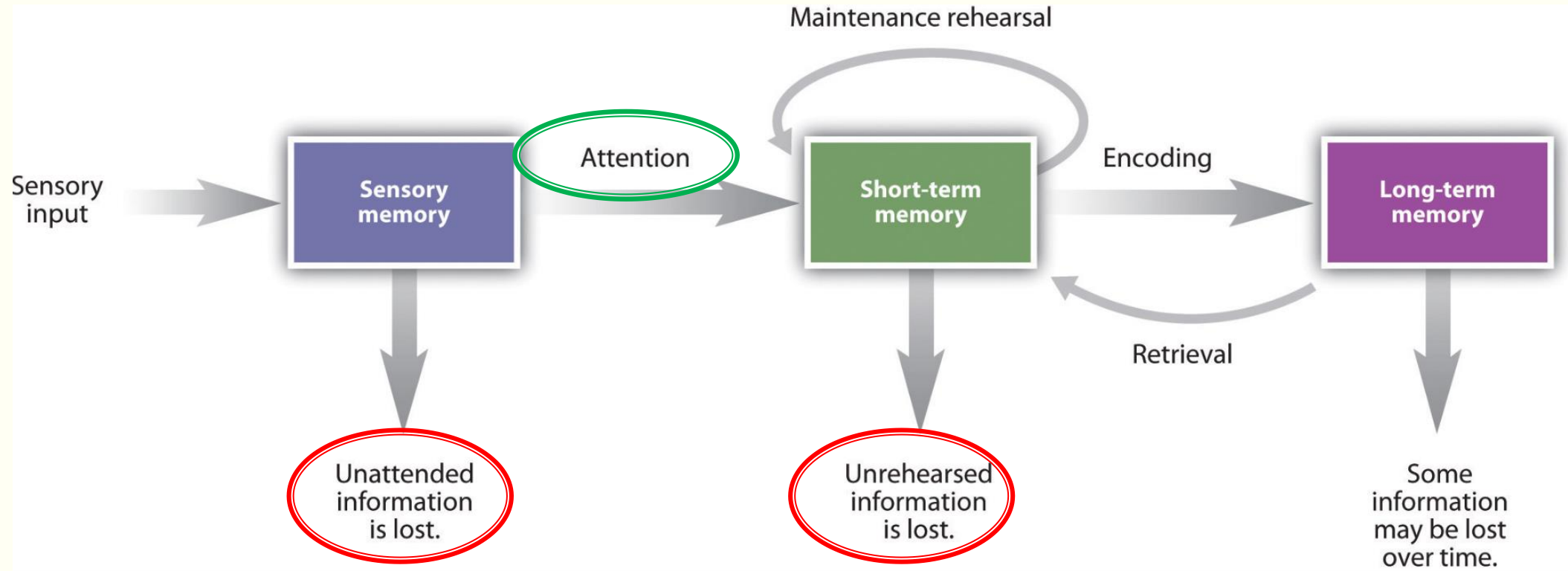


The real learning occurs between working and long-term memory when we think.



There is a wise saying "You have to think to learn,"

2.1 Understanding how memory works(cont.)



2.2 Memory: Sensory, Short-term and Long-term



The creation of a memory begins with **perception**, lasts only a fraction of a second.



It's your **Sensory memory** that allows a perception such as a visual pattern, a sound, etc. linger for a brief moment after the stimulation is over.

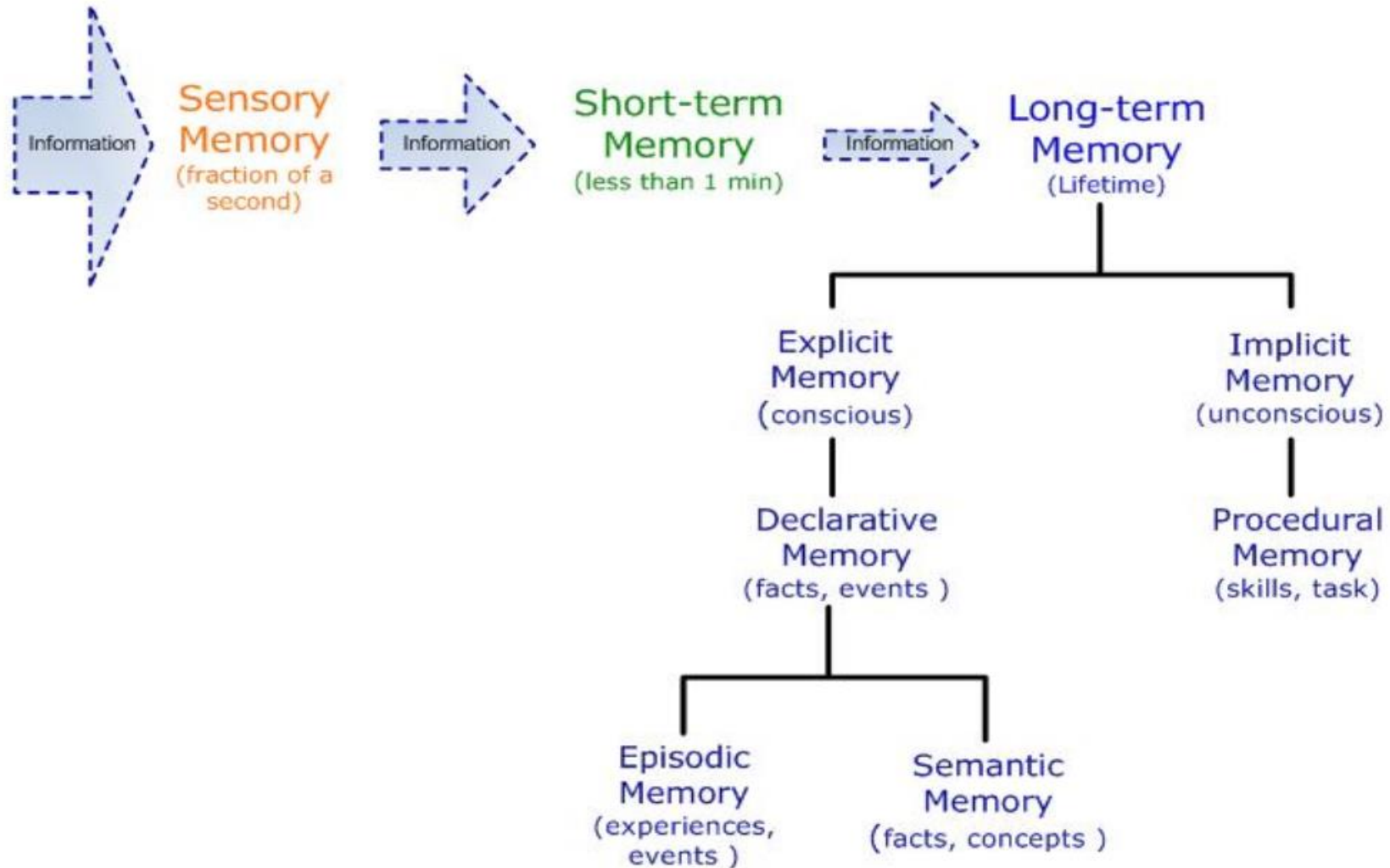


Short-term memory, working memory, has a fairly limited capacity; it can hold about seven items for 5 to 30 seconds at a time.



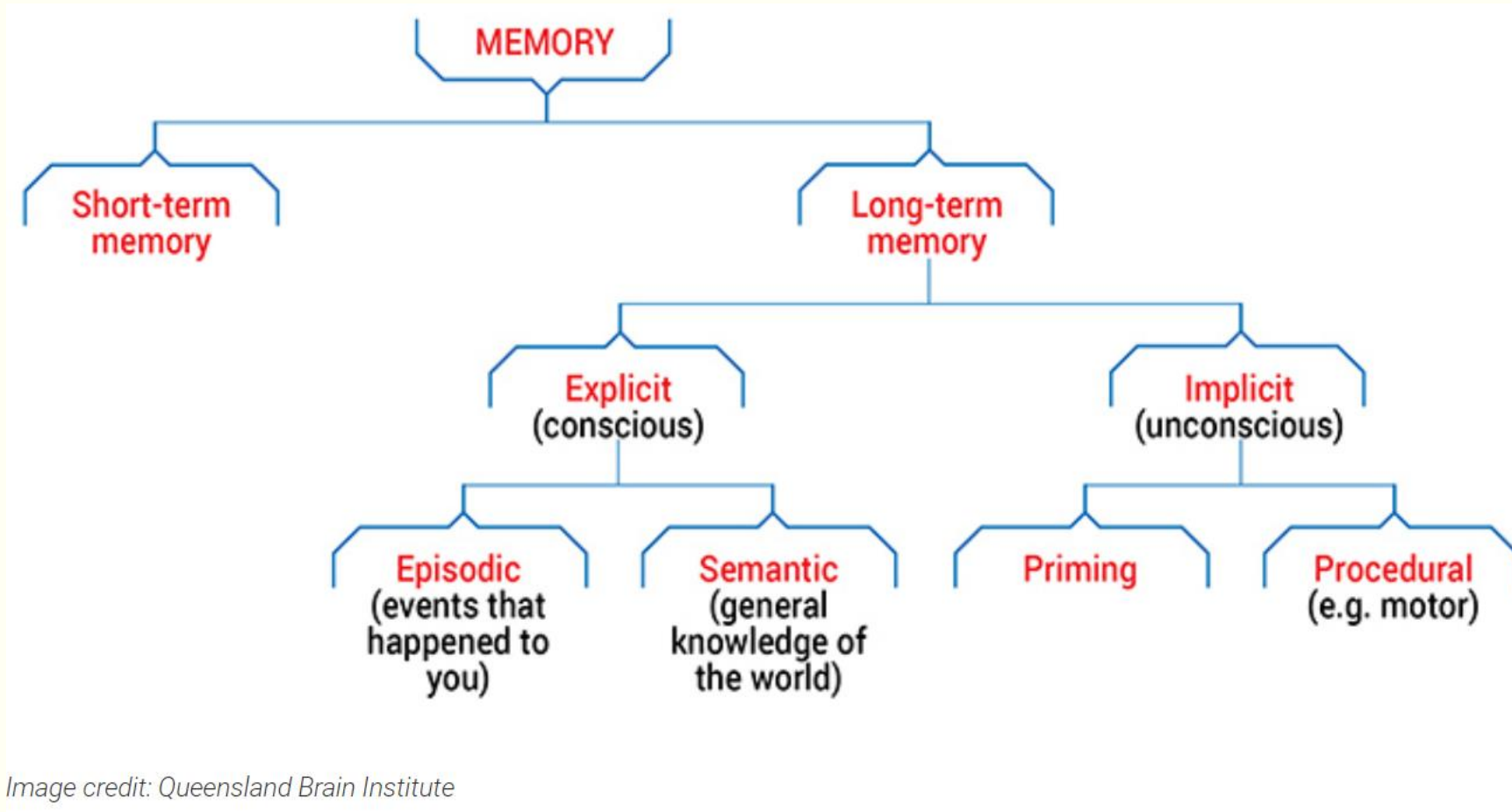
If you consider the information as important then it is gradually transferred from short-term memory into **Long-term memory**. which is thought to be **Unlimited**.

Stage of Memory-Flow diagram



Types of Memories:

Our memories shape who we are!



How does our Memory Work?



Three main processes involved: **encoding**, **storage**, and **recall**.



The new information is usually encoded in one of the four ways:

acoustically (how something sounds);
visually (the way something looks);
semantically (what something means); or
in a tactile or elaborative way (how something feels and connects to other things).



After the information has been **encoded**, it goes to **storage** so that we can **recall**.

2.3. Encoding



Although a memory begins with perception, it is encoded and stored using the language of electricity and chemicals.



Nerve cells connect with other cells at a point called a synapse.



All the action in your brain occurs at these synapses, where electrical pulses carrying messages leap across gaps between cells.

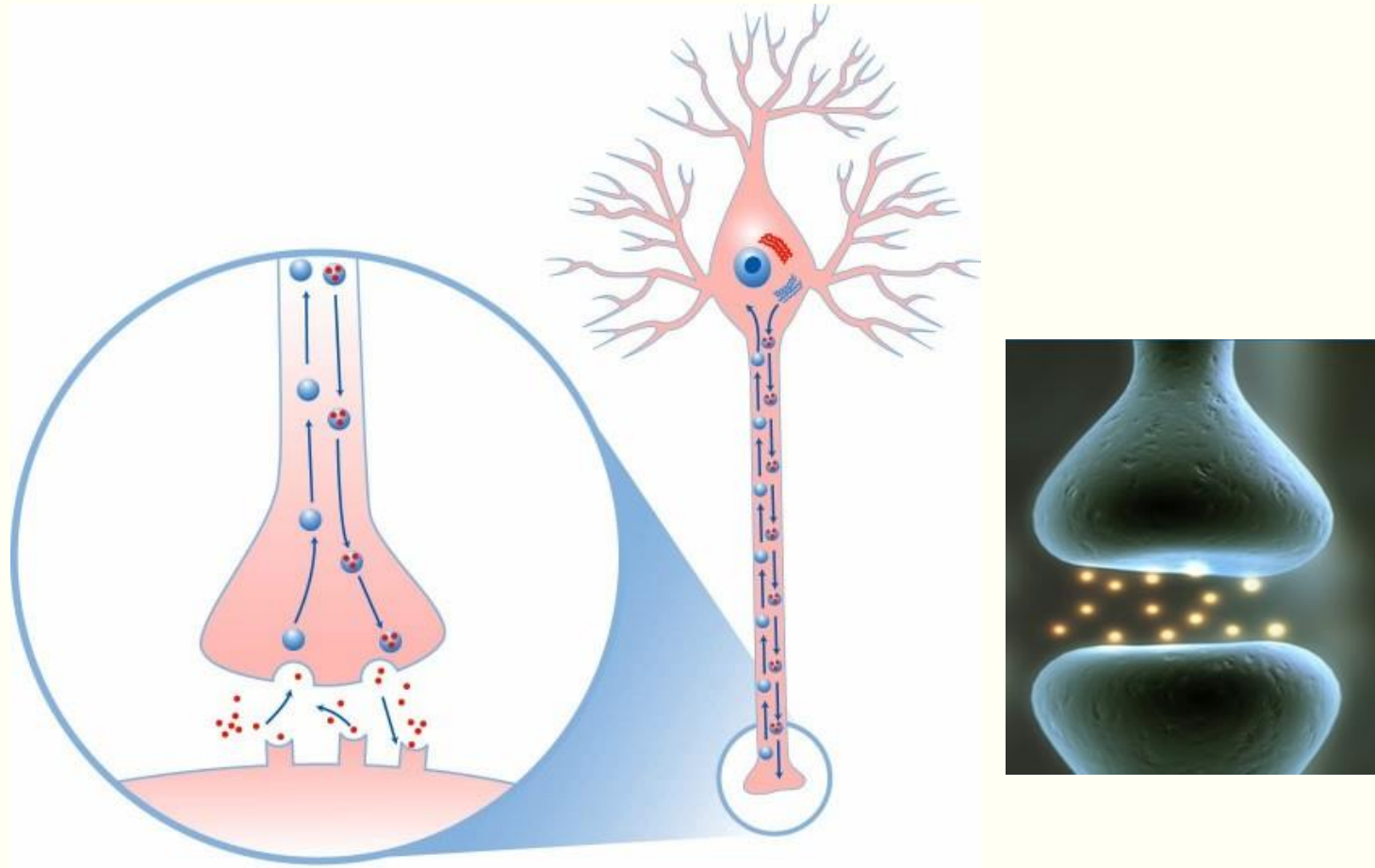


The electrical firing of a pulse across the gap triggers the release of chemical messengers called neurotransmitters.



Stronger Synapses gives improved memory!

Synapses: point of communication between neurons



Courtesy: <https://www.newswise.com/articles/media-article/526385> and others

Brain

- Brain is the jelly-like material weighing around **three pounds or 1.4 kilograms** found within our skulls. Maybe it is the **most complex living machine** on Earth and in the whole universe.
- It is made of approximately **100 billion nerve cells or neurons!**
- Neurons, or brain cells, reach out to other neurons (Link up) through connectors called **synapses** to form memories.
- **When neurons fire off together, a pattern (sometimes called an “engram”) is formed. Recall (Remembering) of the memory will light up the pattern again.**

Brain (cont.)

- **Each neuron** may be connected to hundreds of other cells by as many as **10,000 connections/synapses**.
- A **typical brain** has about **100 trillion synapses**. (1 Trillion= 10^{12} or, 1,000,000,000,000!)
- A lot of memory **consolidation** process **happens while we're sleeping**. Our brains recreate that same pattern of brain activity to strengthen the synapses we created earlier.
- A **sharp mind** and **strong memory** depend on the **strength of your brain's network** of interconnecting neurons through the synapses.

Long-term memory is undoubtedly the most complex one

- First, Creating long-lasting memories is most successful when new information is meaningfully linked to already-existing knowledge in our memories.
- Second, the more we process and think about something new to the learned, the more enduring and retrievable the memories become.
- "You have to think to learn." (to make long term memory)

Making Long term Memories

- "Memory is the residue of thought."

-Cognitive scientist Daniel Willingham in his book *Why Students Don't Like School*

- **"You have to think to learn."** What's created and remains as a result of this thought are memories, or residues in Willingham's terms.
- If students haven't processed the information, what they are hearing or seeing, in an active way, it's simply lost only after 15 minutes.

Making Long term Memories (cont.)

- The more the students reflect about what they are learning and connect new knowledge to old and put things in their own words what they're learning, the more likely they are to remember what they've learned.
- Deep and lasting learning is almost always effortful and difficult. These struggles can actually enhance learning.
- The cognitive scientists Robert and Elizabeth Bjork call this desirable difficulties.

3. EFFECTIVE LEARNING STRATEGIES FOR STUDENTS



Effective learning strategies for students

Research in cognitive science has identified three that are particularly useful and easy for students to apply:

Retrieval
practice,

Spaced
practice,
and

Interleaving.

Retrieval practice

Retrieval practice involves the following:

after students read an assignment for the first time

and take notes, they would put the notes away,

and try to recall the most important ideas and information

Trying to remember (recall) the information is a lot harder than rereading a text or looking at notes, and this struggle strengthens the long-term memory.

Retrieval practice (cont.)



The beginning of class is a good time to do retrieval practice.



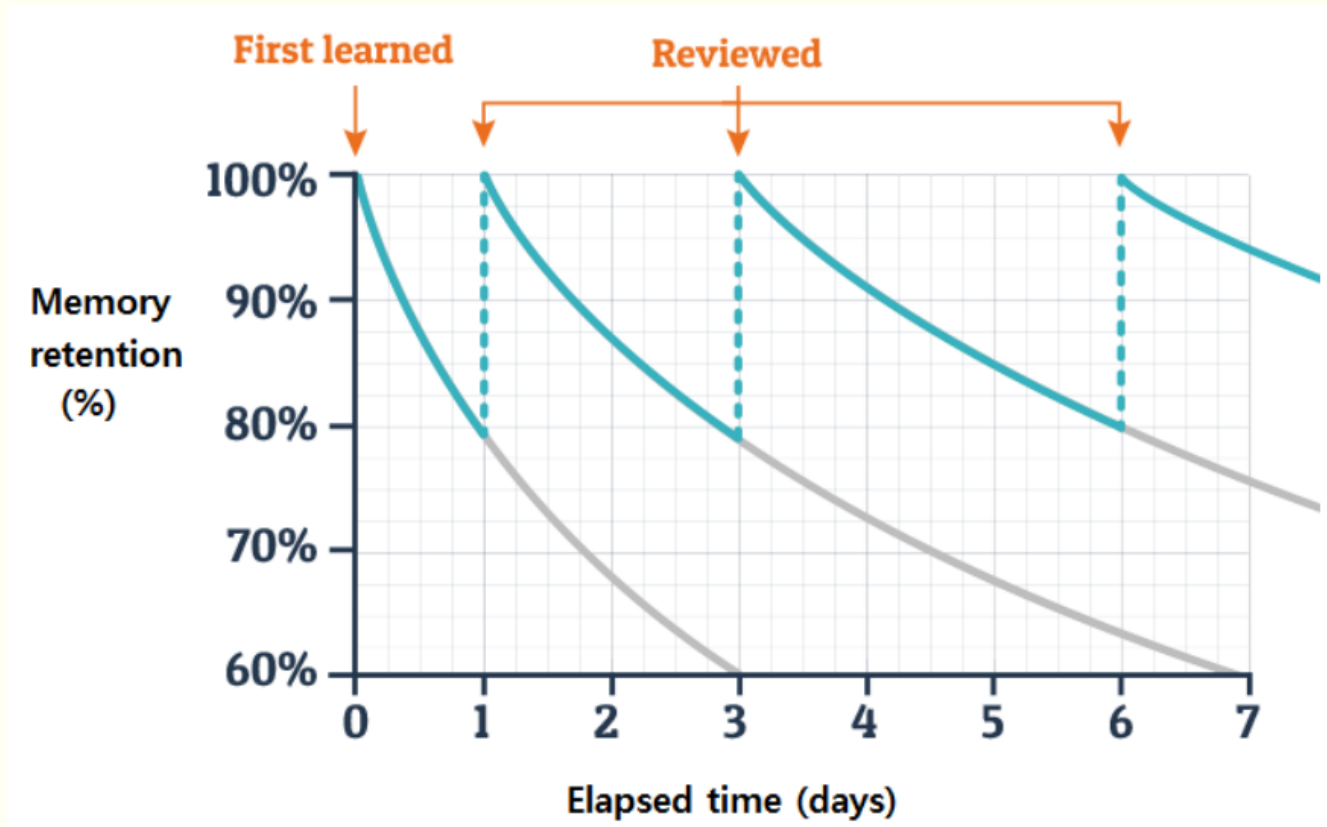
For Example, ask the students to think about the most important concept or skills they learned in the last classes.



Make sure they cannot look at their notes or readings.

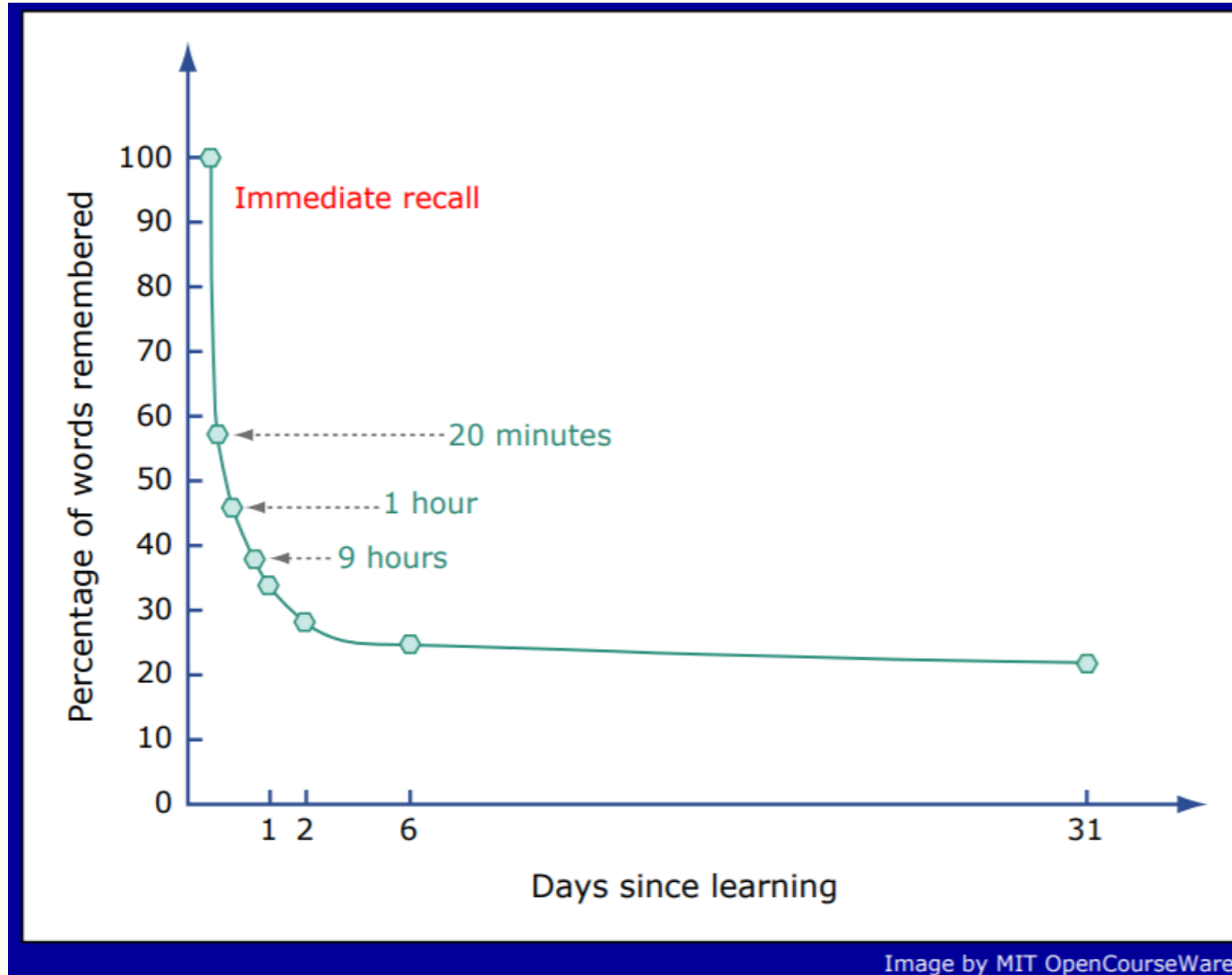
Spacing out learning sessions

- spacing out learning sessions in shorter intervals is a much better way to develop long-term memories.



Ebbinghaus' forgetting curve and review cycle.

Ebbinghaus Curve of Forgetting




Interleaving

Variation of spaced practice is called interleaving.



This involves not only distributing practice over time, but also changing the order of materials studied across different topics/ different subjects.



Switching from one subject to another combines the memory advantages of both spaced practice and retrieval practice.

Active learning

- The teacher must activate the brain of the student. Even a simple question like “What is the date today?” or “How are you today?” makes the brain (of the student) come into action to answer.
- “You have to think to learn” with regard to memory formation. That's what active learning is all about.
- “Give the pupils something to do, not something to learn; and if the doing is of such a nature as to demand thinking; learning naturally results.” -John Dewey in his book -*Democracy and Education*.

Know about Multiple Intelligences (MI) -

Naturalist (nature smart)

Musical (sound smart)

Logical-mathematical (number/reasoning smart)

Existential (life smart)

Interpersonal (people smart)

Bodily-kinesthetic (body smart)

Linguistic (word smart)

Intra-personal (self smart)

Spatial (picture smart)

Five pillars of understanding adult learners,

#1: A MATURING SELF-CONCEPT: As a person matures from a child to an adult, their self-concept also matures. They move from being dependent on others to being self-driven and independent. In other words, maturity leads to growing independence and autonomy.

#2: INCREASING EXPERIENCE: adults build an increasing reservoir of experience. This increasing experience becomes a deepening resource for their learning.

#3: AN INCREASING READINESS TO LEARN

#4: A SHIFTING APPLICATION AND ORIENTATION: Adults encounter problems, learn how to solve those problems,

#5: AN INTERNAL MOTIVATION TO LEARN: Adults are motivated to learn internally. They want to grow in self-development.

Distractions Make Learning Harder

Two major types of distractions:

Internal: Like hunger, fatigue, illness, stress, worries, other distracting thoughts -things you should be doing instead, things you'd rather be doing, etc.

External: External distractions can include things like general noise, other peoples' conversations, TV or movies, music, phone alerts, app alerts, and anything else that diverts your attention from the task at hand

Study Session

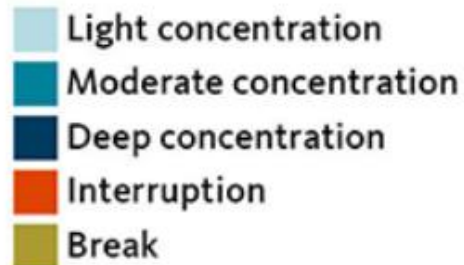
A. The Ideal Study Session: Good Concentration



B. A Common Study Session: Poor Concentration



C. Some Study Sessions: Poor Concentration



Informed by Fig 6.2. Blerkom, Dianna (2010) *Study Sessions and Levels of Concentration*, [image]. From *Orientation to College Learning* (pg. 143), by Dianna L. Van Blerkom, 2010, Boston: Wadsworth Cengage Learning.

Know Your Enemies

Distractions Make Learning Harder

Two major types of distractions:

Internal: Like hunger, fatigue, illness, stress, worries, other distracting thoughts -things you should be doing instead, things you'd rather be doing, etc.

External: External distractions can include things like general noise, other peoples' conversations, TV or movies, music, phone alerts, app alerts, and anything else that diverts your attention from the task at hand. Fix a time say 25 minutes-use stop watch.

Anxiety, Worries -the Hidden Enemy- Anxiety and stress affect working memory

Depression, Sadness - affects your ability to think hold information

Procrastination-
"Procrastination" is derived from the Latin verb "procrastinare" — to put off until tomorrow. The problem is not *doing* the work, it's the *starting of the work!*

So, Start NOW!

Apply Pomodoro technique.

Developed by Italian Francesco Cirillo in the late 1980s. He named the system “Pomodoro” (Italian word, means Tomato) after the tomato-shaped timer. Steps:

- Set a timer for 20 to 30 minutes and start to work.
- When the buzzer sounds, take a two to five minutes break.
- Repeat the session- start to work.
- After four sessions, take a longer break. (10-30 minutes.)



Adult Learning Theories

- Three major theories:
 - Andragogy
 - Self-Directed Learning
 - Transformational Learning

Andragogy and Pedagogy

Andragogy is the art and science of helping adults learn, the facilitation learning for adults, who are self-directed learners.

Teacher is a facilitator, there is climate of collaboration, respect and openness.

Pedagogy is the art and science of teaching children or dependent personalities. Teacher designs the learning process, imposes material,

Andra = adult Peda = child

In the Greek, andragogy means “man-leading” (learning is very self directed) while pedagogy means “child-leading” –reliant on the Teacher

Pedagogy vs. Andragogy

Center for Online Learning, Research and Service,
University of Illinois, Springfield, USA

	PEDAGOGY CHILDREN'S LEARNING	ANDRAGOGY ADULTS LEARNING
DEPENDENCE	The learner is a dependent personality. Teacher determines what, how, and when anything is learned.	Adults are independent. They strive for autonomy and self-direction in learning.
RESOURCES FOR LEARNING	The learner has few resources — the teacher devises transmission techniques to store knowledge in the learner's head.	Adults use their own and other's experience.
REASONS FOR LEARNING	Learn in order to advance to the next stage.	Adults learn when they experience a need to know or to perform more effectively.
FOCUS OF LEARNING	Learning is subject centered, focused on the prescribed curriculum and planned sequences according to the logic of the subject matter.	Adult learning is task or problem centered.
MOTIVATION	Motivation comes from external sources — usually parents, teachers, and a sense of competition.	Motivation stems from internal sources — the increased self-esteem, confidence and recognition that come from successful performance.
ROLE OF THE TEACHER	Designs the learning process, imposes material, is assumed to know best.	Enabler or facilitator, climate of collaboration, respect and openness

Self-Directed Learning



Self-Directed Learning (SDL) is a process in which individuals take the initiative, without the help of others in planning.

SDL is an informal process that takes place outside the classroom.

The benefit of **SDL** is that learning can easily be incorporated into daily routines and occurs at the learner's convenience.

Transformational Learning: **Tomorrow's Teaching and Learning** (Western Governors University and Stanford University, USA)

- Transformative learning was introduced by Mezirow (1997) as a change process that transforms frames of reference
- Transformational learning is **the process of deep, constructive, and meaningful learning that goes beyond simple knowledge acquisition and supports critical ways in which learners consciously make meaning of their lives.**
- **Transformative Learning (TL)** is learning that changes the way individuals think about themselves and their world and that involves a shift of consciousness.
- For more information on the topic:
- <https://www.wgu.edu/blog/what-transformative-learning-theory2007.html#close>
- <https://tomprof.stanford.edu/posting/621>

Fixed mindset vs. Growth mindset

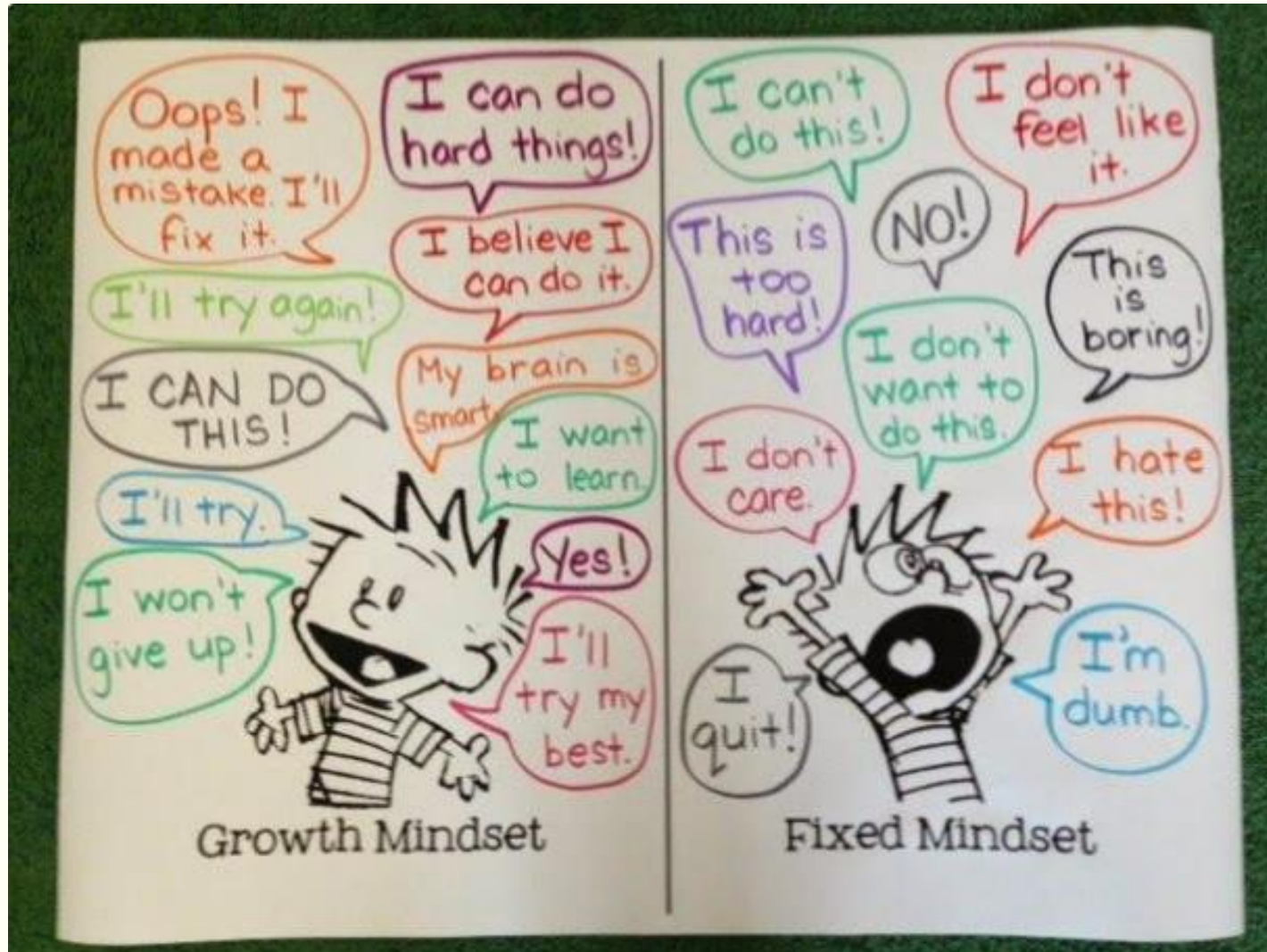


“In a fixed mindset, **people believe their basic qualities, like their intelligence or talent, are simply fixed traits.** They spend their time documenting their intelligence or talent instead of developing them. They also believe that talent alone creates success—without effort.” (Dweck, 2015)



Growth mindset: Someone with a growth mindset views intelligence, abilities, and talents as learnable and capable of improvement through effort.

Fixed mindset vs. Growth mindset



Fixed mindset to Growth mindset- Change your words

CHANGE YOUR WORDS; CHANGE YOUR MINDSET.

The infographic is divided into two columns. The left column is titled 'FIXED' and features a grey brain. The right column is titled 'GROWTH' and features a rainbow-colored brain. Each column contains several thought bubbles with text representing typical mindset statements.

FIXED	GROWTH
I'll never be as smart as that person.	Everyone is talented in many ways.
I can't do it.	I'm still learning. I'll keep trying.
This is too hard.	With more practice it will be easier.
I'm not good at this.	This may take some time and effort.
I made a mistake.	Mistakes help me learn.
I give up.	I can try a different strategy.

Characteristics of successful and struggling students

(from Cuesta College, CA, USA)

<i>Successful Students</i>	<i>Struggling Students</i>
Accept personal responsibility for creating the outcomes and quality of their lives	See themselves as victims, believing for the most part that what happens to them is beyond their control
Discover a motivating purpose, characterized by personally meaningful goals and dreams	Have difficulty choosing a purpose and often experience depression and/or resentment about the meaninglessness of their lives
Consistently plan and take effective actions in pursuing their goals and dreams	Seldom identify the specific actions needed to accomplish a task, and when they do, they tend to procrastinate
Build mutually supportive relationships that assist them in pursuing their goals and dreams	Are solitary, seldom requesting, even rejecting offers of assistance from legitimate resources
Gain heightened self-awareness, developing empowering beliefs, attitudes, and behaviors that will keep them on course	Are slaves of disempowering life scripts that carry them far off course
Become life-long learners, finding valuable lessons in nearly every experience they have	Tend to resist learning new ideas and skills, often viewing learning as drudgery rather than mental play
Develop emotional maturity, characterized by optimism, happiness, and peace of mind	Live at the mercy of their emotions, having success hijacked by anger, depression, anxiety, and a need for instant gratification
Believe in themselves, feeling capable, lovable, and unconditionally worthy as human beings	Doubt their personal value, feeling inadequate to accomplish meaningful tasks and unworthy to be loved by others or themselves

Metacognition

- **What is metacognition?**
- Metacognition describes the processes involved when learners plan, monitor, evaluate and make changes to their own learning behaviors.

Activities such as planning how to approach a given learning task, monitoring comprehension, and evaluating progress toward the completion of a task are metacognitive in nature.

Metacognition is learning in progress



If students reflect on how they learn, they become better learners



Thinking about thinking – monitoring our own thinking.



Knowing about knowing – being aware of what you know.



Cognitive self-management – planning, decision making, identifying problems and setting goals.



Emotional self-management – knowing how to control our own emotions, how to show empathy, etc.



Self evaluation – evaluating our own performance.

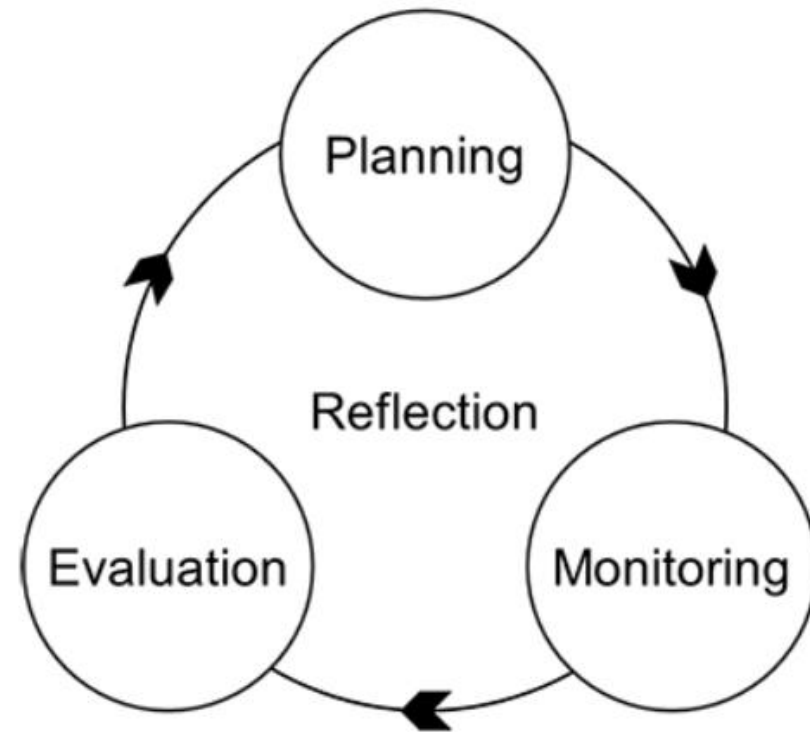
Metacognition Phases

“metacognition lies at the root of all learning”

“...self-knowledge, awareness of how and why we think as we do, and the ability to adapt and learn, are critical to our survival as individuals...”

- James Zull (2011) *From Brain to Mind: Using Neuroscience to Guide Change in Education*

Metacognition phases



Metacognition- Self-awareness

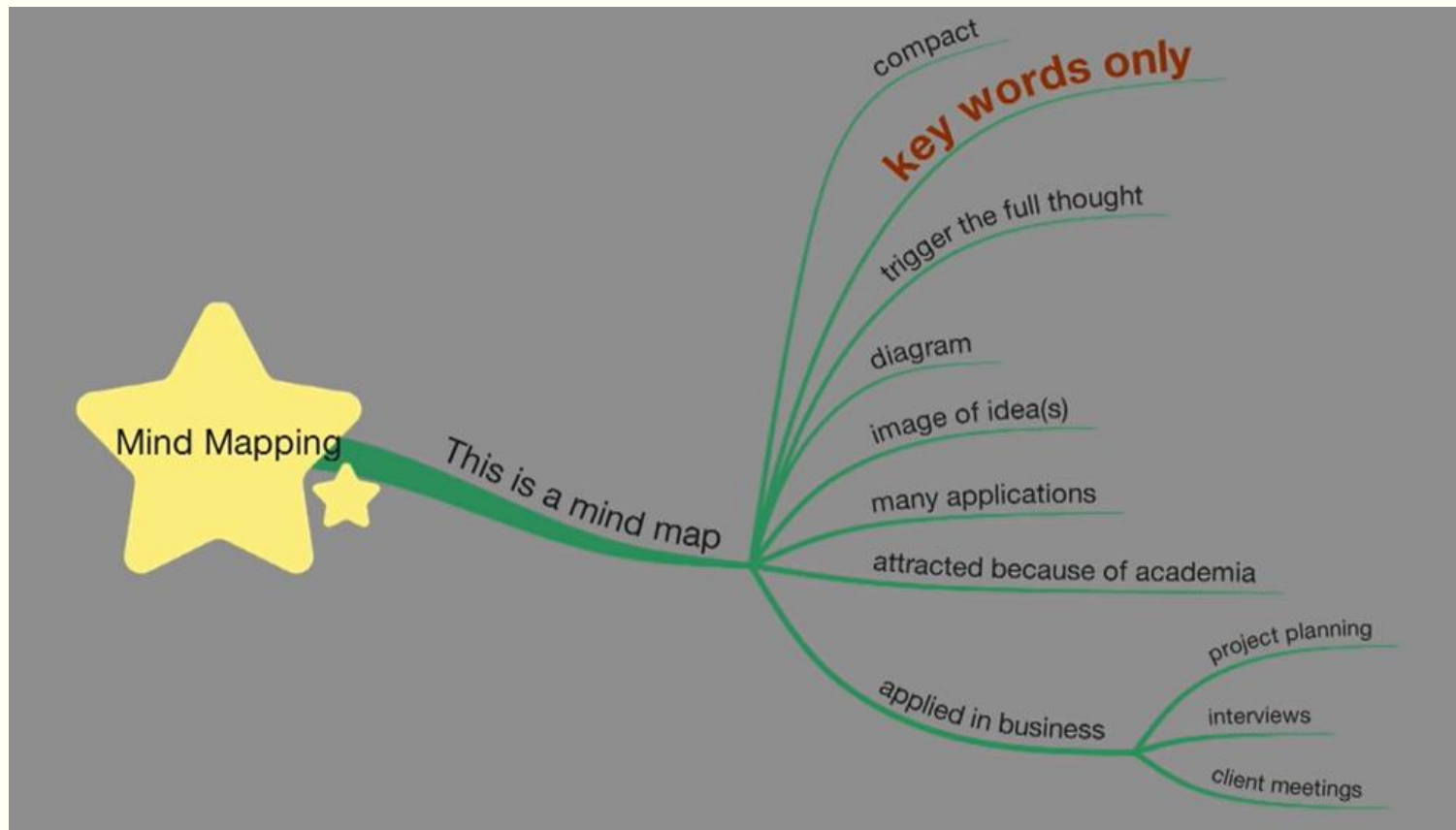
Self-awareness plays a critical role in how students make sense of life experiences, including empathy, curiosity, and sociability.

If students reflect on how they learn, they become better learners.

Students learn to regulate their behavior to optimize learning. They begin to see how their strengths and weaknesses affect how they perform

Mind Mapping

- Mind maps are diagrams used to **visually organize information hierarchically**. It is a highly effective way of note-taking and note-making that literally "maps out" your ideas.



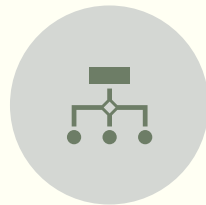
Mind Mapping (cont.)



Four Essential Characteristics of Mind Mapping:



The main idea or focus or subject is placed in a central image



For Each idea/concept create a branch. These 'branches' radiate from the central image

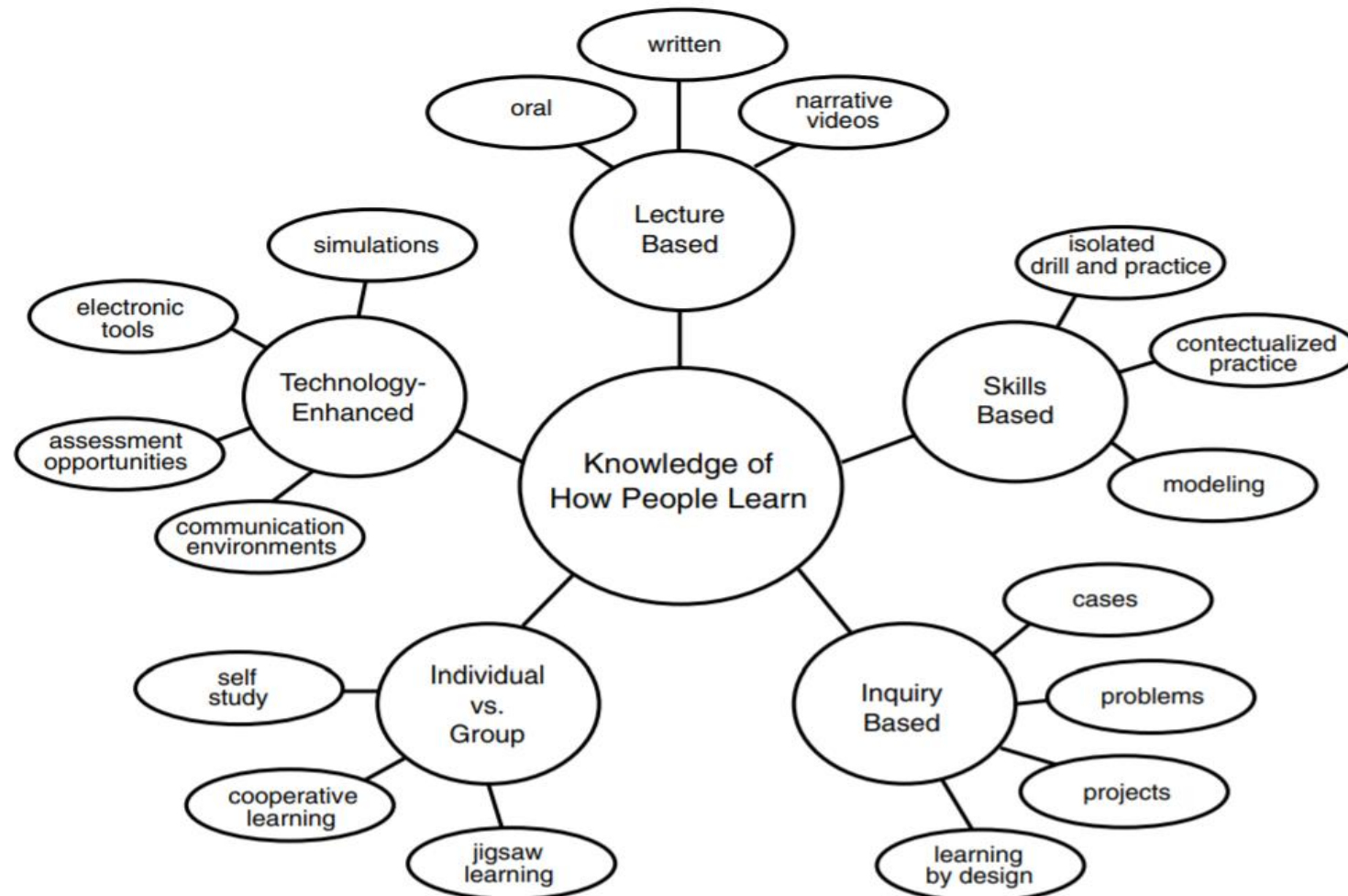


The branches comprise a key image or key word drawn on its associated line



Topics of lesser importance are represented as 'twigs' (2nd and 3rd level branch, from thick to thin) of the relevant branch

Mind Mapping: Example-1



Use both Focused and the Diffuse modes



We have two different modes of **thinking**: the **focused mode** and **diffuse mode**. We are in either in one mode or the other. Both these modes are highly important for learning.



To learn something new – go back and forth between the **FOCUS** and **DIFFUSE** Modes



The **focused mode** is when we concentrate on solving an issue or to decide.



Diffuse mode is associated with “**big picture**” perspectives and happens when you **relax and let your mind wander**. If you are trying to understand or figure out something new, turn off your focused thinking and turn on your diffuse mode-Take a walk, etc.

Inventor of Light Bulb-Thomas Edison used diffuse mode

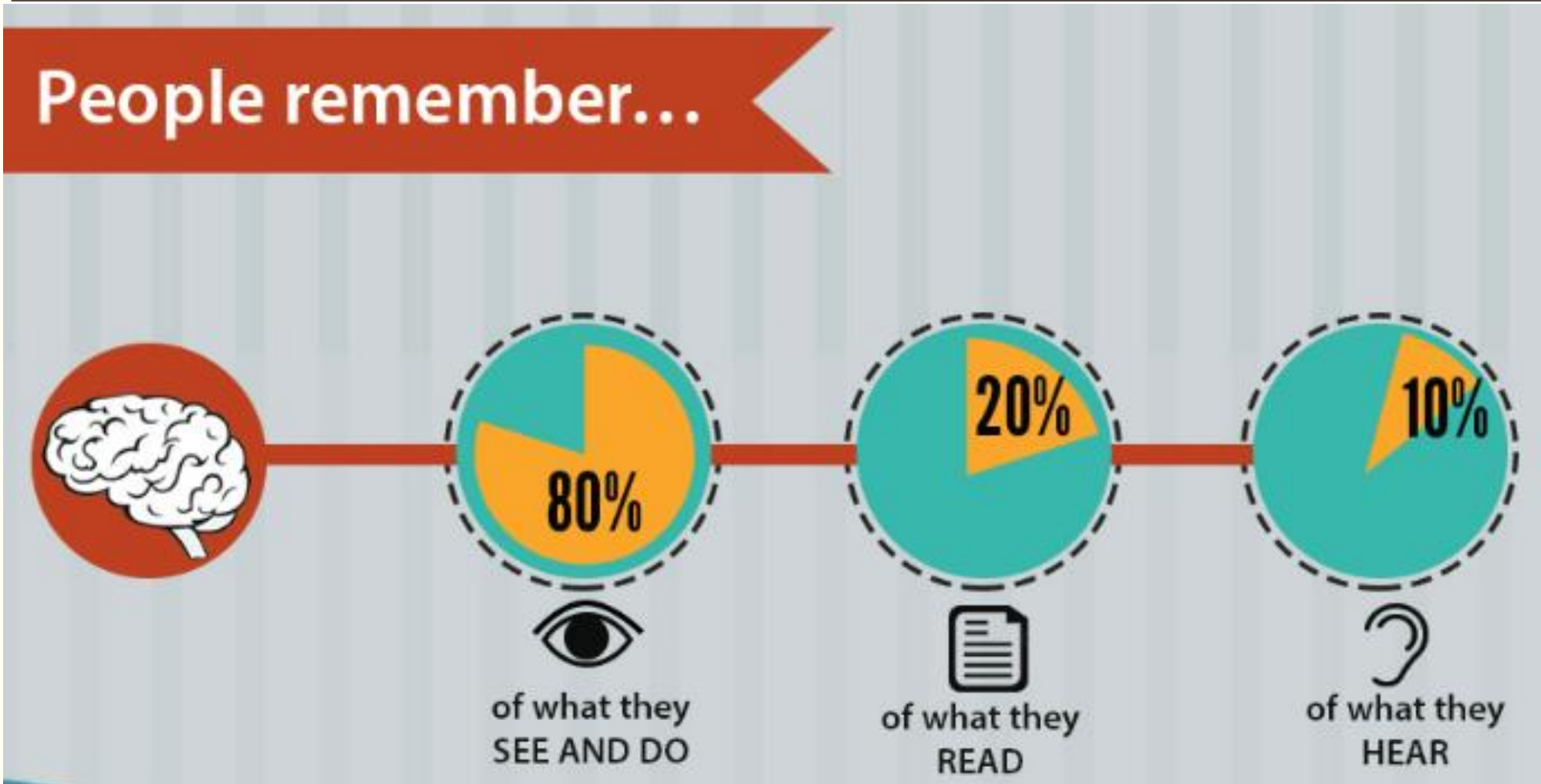
- **Thomas Edison** — used **diffuse mode** —he could often be found taking a break from his experiments to sit and relax with **ball bearings** in his hands. When he fell asleep, the sound of the **ball bearings** dropping to the ground would wake him up.”
- courtesy- Coursera lecture series 'Learning How to Learn'-Dr. **Barbara Oakley**
- **Edison** and his team of researchers in **Edison's** laboratory in Menlo Park, N.J., USA, tested more than **3,000 designs** for **bulbs** between 1878 and 1880 to come up with the first Light bulb.



4.1 Use images

- Images are processed faster by the human brain than words. In fact, our brains process 90 percent of information visually. Visual information is also processed 60,000 times faster than text.
 - (<https://www.t-sciences.com/news/humans-process-visual-data-better>)
- According to a study, after 3 days, people retain:
 - 10% of what they read
 - 20% of what they hear
 - 65% of what they see
 - Another study suggests that 40% of learners respond better to visuals compared to text
 - (<https://www.edumatech.com/the-power-of-visuals-in-online-learning/>)

People remember..



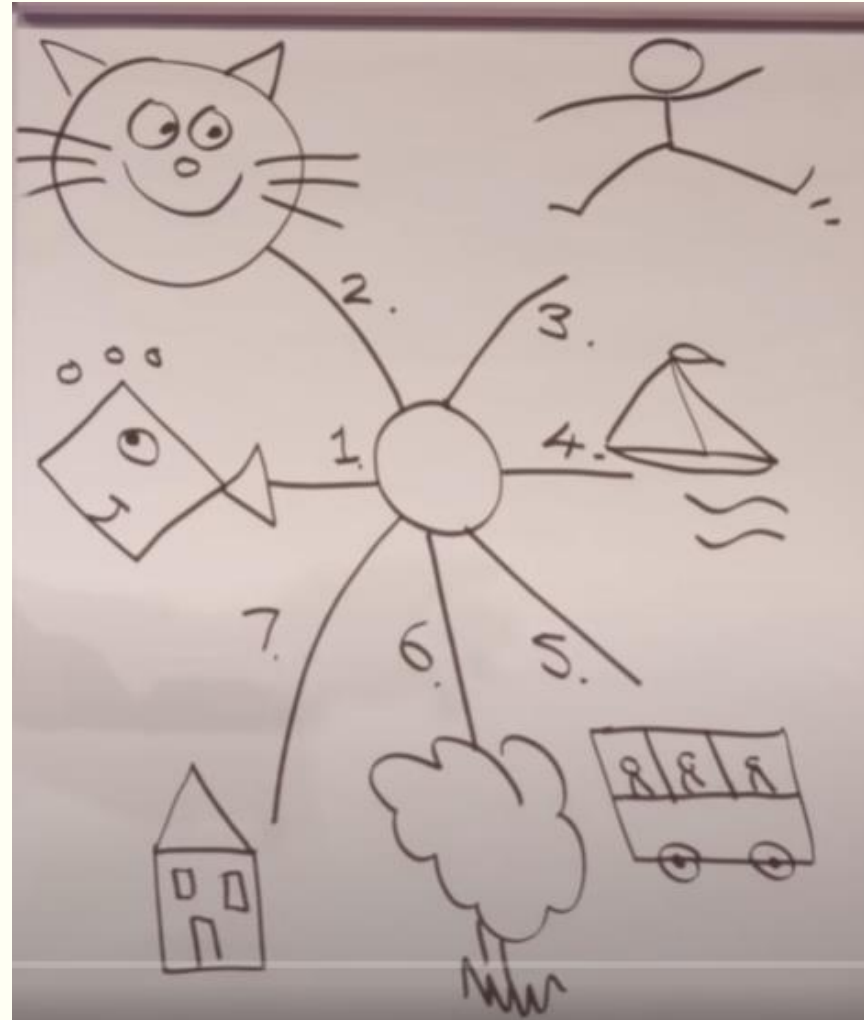
Draw Pictures: A Picture Worth a Thousand Words

- There is a wise saying, “If you listen, you forget; if you see, you remember, if you do, you understand”
- Hear a piece of information, and three days later you’ll remember 10 percent of it. Add (Make) a picture of the information and you’ll remember 65 percent.
- Therefore, Make/Create Images.
- You can remember if you see the map with direction, but it is difficult to remember if you listen to the directions.

Exercise: Try to remember the following words in order

- 1. Fish
 - 2. Cat
 - 3. Human
 - 4. Boat
 - 5. Bus
 - 6. Tree
 - 7. House
-
- For most of the people it is difficult to remember words but easy to remember images, drawing, visual memory

Exercise: Draw this Figure with numbers and images in a white paper which are the drawings for the 7 words discussed earlier

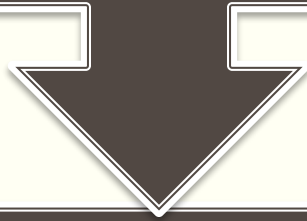


Can you remember the drawing now?

- Now try to draw the same images in order in a blank page without looking at the drawing.
- Can you remember those?
- Did you find it easier to remember with drawings than words?
- People remember more when they see (images-visual memory) than what they listen to.

4.2 Use Deep Processing

Deep processing is a way of learning in which you try to make the information meaningful to yourself. which involves a more meaningful analysis (e.g., images, thinking, associations etc.) of information



Here are four ways to process information deeply (and learn it forever):

Elaborate on
the information

Make
distinctions

Apply it to your
life

Explore it
further

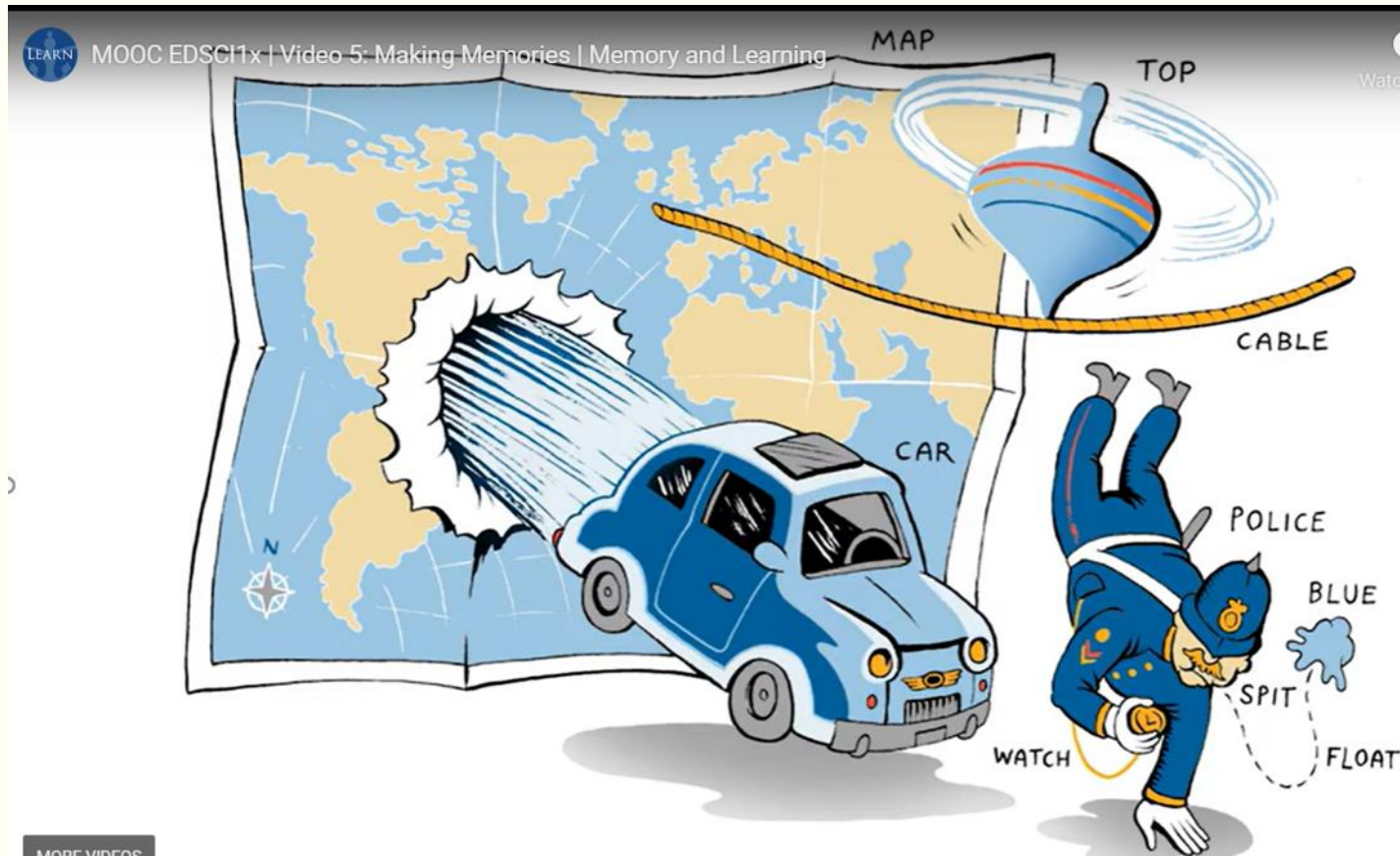
Deep processing Example:

How can you remember Nine words? Such as:

1. Car,
2. Map,
3. Top,
4. Cable,
5. Police,
6. Watch,
7. Spit,
8. Blue,
9. Float

Deep processing Example: (cont.)

- Make a story with those words and put in a picture or diagram



4.3 Use Acronyms or word mnemonics

- An acronym is an abbreviation formed from the first letter of a series of words.
- A mnemonic is a short phrase used to remember a rule or a principle
- Try to use it always. Let us try this one:
Order of operation: Parentheses, Exponents, Multiplication, Division, Addition, Subtraction- (PEMDAS): "Please Excuse My Dear Aunt Sally" : PEMDAS.



Image mnemonics

- **Image mnemonics** use a visual reference to aid recall. For example, you can use your hands to recall how many days are in each month.



expression or word mnemonics

- In **expression or word mnemonics** items in a list are arranged by their first letter to create a word or phrase. The name 'McHale' can aid the recall of the different forms of energy:

Mechanical

Chemical

Heat

Atomic

Light

Electrical.

4.4 Prior Knowledge, Making Connection



We need prior knowledge and a system for organizing the information.



Try to link what you want to learn with previous experience, prior knowledge.



Did you have prior experience, similar knowledge before? Ask yourself, i.e., self-talk, if you can relate the new material to your earlier long-time memory.

4.5 Association- We remember things by association.



Do most of us have a bad memory?



Experts say, most of us don't. Most of us have a really good memory, but we just don't have the practice to use it.



Our memory works by association. If there is no association between things, it's very difficult to remember them.



Why association works? Because it attaches a string with something familiar, such as old friends or places!

4.6 Chunking or clustering

- It is as an efficient approach for utilizing limited working (short time) memory. It breaks up long strings of information into **units or chunks**
- Research suggests that on average the human brain can hold **4 to 7 different items in its working (short-term) memory**. Some say **7+/-2** chunks.
- **Exercise 1:**
 - Try to memorize the random number within 5 seconds,
 - **9 3 2 7 0 8 1 5 6 4 (10 digits)**
 - and then recall.
 - Could you remember it? It is difficult since **10 chunks**.

Chunking or clustering (-cont.)

- If you could chunk this number
- **93 27 08 15 64 (5 chunks)** or,
- **932 708 1564 (3 chunks)**
- Try to remember this. It is easy now!
- Another one: **0 5 6 7 7 5 8 9 6 3 (10 chunks)**
- Break into **(3 chunks) : 056 775 8963**
- It is easy now!

4.7 Practice makes permanent.



Repeated retrieval during learning is the key to long-term retention.



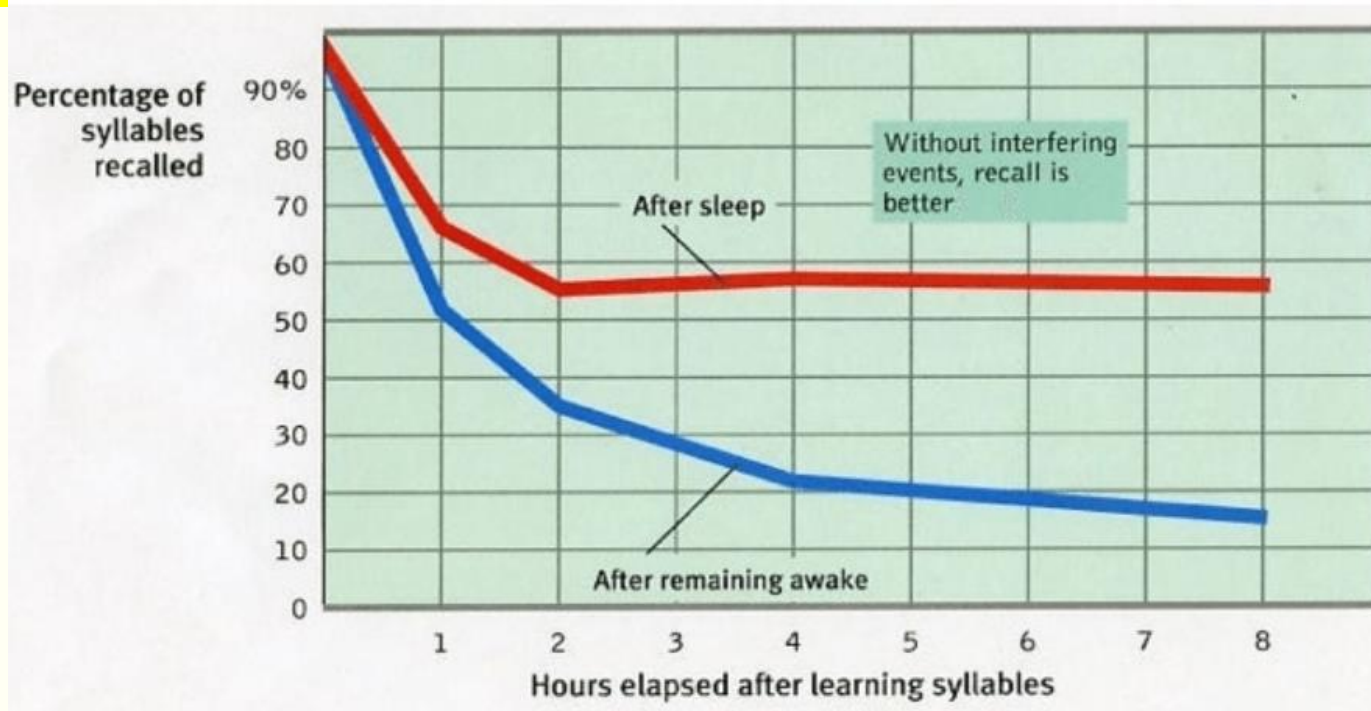
Each time you review that knowledge, this mental manipulation increases activity along the connections between nerve cells (Synapses).



Repeated stimulation—for example, studying the times tables many times—makes the network stronger, just like muscles become stronger when you exercise them. And that makes the memory stay in your brain. Practice makes permanent.

4.8 Sleep Well: It will Clean Your Brain

- Your brain flushes out **toxins** that have accumulated during the day. It is also important for consolidating short-term memories into long-term memories
- **Deep Sleep Gives Your Brain a Deep Clean.**
- **Naps improve your brain's day to day performance**

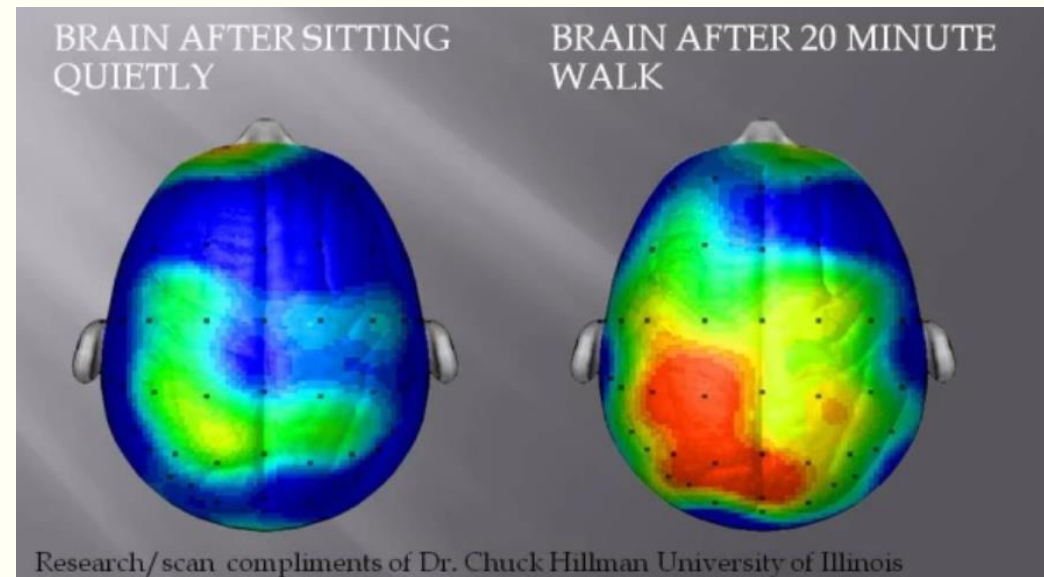


How Much Sleep Do I Need? (Content source: [National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health, U.S.A.](#))

Age Group		Recommended Hours of Sleep Per Day
Newborn	0–3 months	14–17 hours (National Sleep Foundation) ¹ No recommendation (American Academy of Sleep Medicine) ²
Infant	4–12 months	12–16 hours per 24 hours (including naps) ²
Toddler	1–2 years	11–14 hours per 24 hours (including naps) ²
Preschool	3–5 years	10–13 hours per 24 hours (including naps) ²
School Age	6–12 years	9–12 hours per 24 hours ²
Teen	13–18 years	8–10 hours per 24 hours ²
Adult	18–60 years	7 or more hours per night ³
	61–64 years	7–9 hours ¹
	65 years and older	7–8 hours ¹

4.9 Exercise daily.

- Exercising as little as 20 minutes a day can increase your brain function. Exercise helps you learn faster and retain information better.



4.10 Eat a Healthy Diet: Fruits and Vegetable

- What a person puts into their body directly affects how they think and feel, and certain foods can help improve memory. Omega-3 fatty acids, vitamins, unsaturated fats, and fiber are particularly important for your brain.
- **Drink lots of water as well to stay hydrated.**
- Harvard Health Publishing suggests that maintaining a healthy diet that includes green, leafy vegetables (e.g., spinach and broccoli) and fatty fish (e.g., salmon and light tuna), as well as berries, walnuts, tea and coffee, can help to improve memory. Healthline also recommends pumpkin seeds, dark chocolate, oranges and eggs as foods that can improve and maintain memory.

4.11 Meditate to improve Your Memory



Mindfulness meditation, teaches you to focus your mind. When you're able to focus better, you're also better able to solidify concepts in your short-term memory.



The authors of a [2018 research paper](#) note that many studies show meditation improves brain function, reduces markers of brain degeneration, and improves **both working memory and long-term term memory**. The researchers observed the brains of people who regularly practiced meditation and those who did not.

4.12 Maintain social relationships.

Interaction with friends and family can help reduce stress levels, enhance intellectual stimulation, combat depression, and potentially slow the rate of memory decline

Psychology Today writer Angela K. Troyer, PhD, explains, “People who connect with others generally perform better on tests of memory and other cognitive skills. And, in the long run, people with active social lives are less likely to develop dementia than those who are more socially isolated.”

4.13 Recall is better than Rereading the Text

- **The practice of remembering things without rereading the text can improve brain function.**

- Active recall involves retrieving information from memory. It's a Close book exercise!

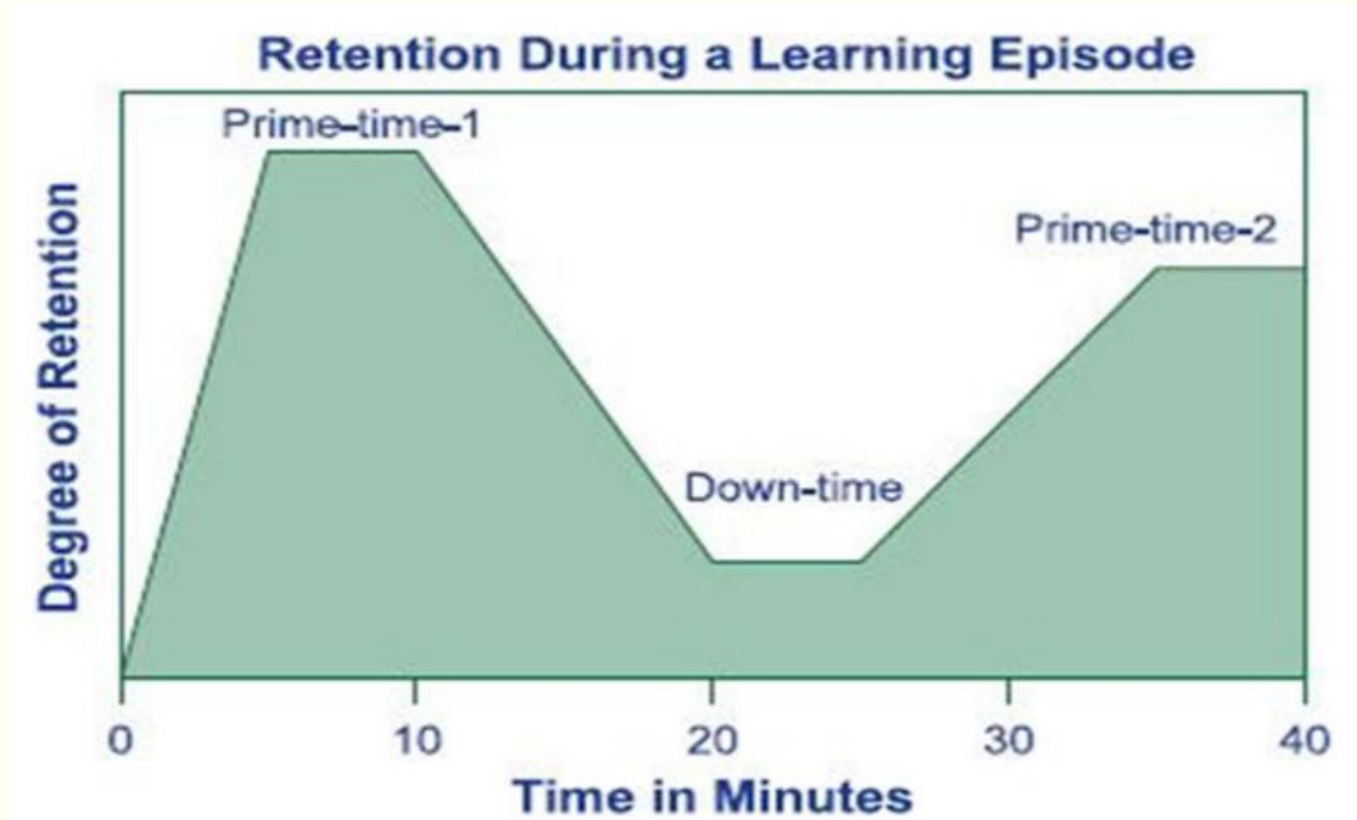
“When neurons fire off together, a pattern (sometimes called an “engram”) is formed. Recall (remembering) of the memory will light up the pattern again.” (Dr. Megan Sumeracki and Dr. Yana Weinstein, the Learning Scientists’ book)

4.14 Read every day.

- Reading a book of your interest can actually enhance your cognitive(thinking/perception) function. Reading also helps to develop language skills and increase attention spans. Benefits:
- Mental Stimulation
- Memory Improvement
- Stronger Analytical Thinking Skills
- Improved Focus and Concentration
- Better Writing Skills
- calmness/tranquility

4.15 Know about the Primacy/Recency Effect

- The **Primacy/Recency** Effect is the observation that information presented at the beginning (**Primacy**) and end (**Recency**) of a learning episode tends to be retained better than information presented in the middle. We remember best which comes first, second best which comes last, and least which comes just past the middle.





5. CLASSROOM MANAGEMENT

Teacher Centered and Person-Centered Classrooms

Discipline Comparison in Teacher-Centered and Person-Centered Classrooms

Teacher-Centered	Person-Centered
Teacher is the sole leader	Leadership is shared
Management is a form of oversight	Management is a form of guidance
Teacher takes responsibility for all the paperwork and organization	Students are facilitators for the operations of the classroom
Discipline comes from the teacher	Discipline comes from the self
A few students are the teacher's helpers	All students have the opportunity to become an integral part of the management of the classroom
Teacher makes the rules and posts them for all students	Rules are developed by the teacher and students in the form of a constitution or compact
Consequences are fixed for all students	Consequences reflect individual differences
Rewards are mostly extrinsic	Rewards are mostly intrinsic
Students are allowed limited responsibilities	Students share in classroom responsibilities
Few members of the community enter the classroom	Partnerships are formed with business and community groups to enrich and broaden the learning opportunities for students

Note. From *Freedom to Learn, 3rd Edition* (p. 240), by C. Rogers and H. J. Frieberg, 1994. Columbus: Merrill Publishing. Copyright 1994 by Prentice-Hall, Inc., Upper Saddle River, NJ. Adapted with permission.

Some Effective Classroom Management Strategies

1. The effective teacher should not set rules for the class rather set up norms, let Students help establish guidelines, i.e., ask the students to produce statements what they should not do during the class-time and have that in written form signed by the students and the teacher as an agreement between the teacher and the students.

2. Demonstrate The Ideal Behavior You Want To See

2.(cont.) Modeling ideal behavior teaches students how to act properly in a classroom environment.

3. Encourage Questioning.
Questioning is the Door of the knowledge

4. Let Students Lead.
Encourage initiative.

5. Encourage Group work or Projects.

6. Avoid Punishing the Whole Class- Address for isolated discipline problems

7. Keep A Friendly Disposition. ...

8. Give Praise Generously.

Active learning

The teacher must activate the brain of the student. Even a simple question like “What is the date today?” or “How are you today?” makes the brain (of the student) come into action to answer.

“You have to think to learn” regarding memory formation. That's what active learning is all about.

"Give the pupils something to do, not something to learn; and if the doing is of such a nature as to demand thinking; learning naturally results."-John Dewey in his book -*Democracy and Education*.

Managing classroom behaviour

If the students are misbehaving, it may be for one of two reasons:

- They're bored - they don't find the lesson content interesting(stimulating) enough. Bored students are equal to trouble!
- They're struggling - they're finding the work difficult and are creating a distraction.

Dealing with the Problematic students



Engage students one-on-one. Use the time right before and after the class to make small talk with the problematic students.



Learn to have an effective discussion with an argumentative student after the class, not during the class.



You can seek early course evaluations through any online anonymous survey, or quick in-class anonymous feedback with one -minute papers.

Retrieving Memories: Cued recall and free recall



Cued recall is any specific visual or verbal cue provided to students (e.g., written question) intended to elicit a memory.



Free recall, on the other hand, is much less specific. For example, a teacher might ask, what were the most important ideas discussed in the last lecture/class.

Body language



ADOPTING A CONFIDENT STANCE: IT SHOWS THAT YOU'RE IN CONTROL OF THE LESSON.



SMILING AND BEING ENTHUSIASTIC: SENDS THE MESSAGE THAT THE LESSON IS EXCITING AND WORTH LEARNING.



CIRCULATING AROUND THE CLASSROOM WILL SHOW THAT YOU'RE CONSIDERATE OF EVERY STUDENT IN THE CLASS.

Limited Lecture



Less is more when it comes to lectures. After 12-15 minutes of lecturing, you should engage your students in some sort of action, even if it's only for a few minutes. The teacher may then continue lecturing for another session.



For example, students could draw a picture or write a few phrases that summarize the lecture, complete an example problem, or engage in a group discussion.

Don't put Feedback along with a Grade



As soon as we put a grade along with our comments, many students will ignore our feedback as they react to the grade, good or bad.



So, strong encouragement is to not provide feedback in the form of descriptive comments and grades at the same time.



Put comments without grades: e.g., take a test and tell them it will not be graded but you will review and give feedback. In this way, they will be attentive to feedback, not grades.

Provide descriptive feedback to students

First, provide descriptive feedback to students that helps them answer questions like what are my strengths and what am I doing well? What are the most important things I need to work on?

Comments need to be clear and easy to understand.

Students need to clearly see the gap between where they are and where they need to be.

Second, as Dylan Williams suggests, the best way to figure out what students know is by talking to them and engaging them in dialogue.

Third, teach students to self-assess and peer-assess.

Metacognitive practices:

Preassessments—Encouraging Students to Examine Their Current Thinking: “What do I already know about this topic that could guide my learning?”

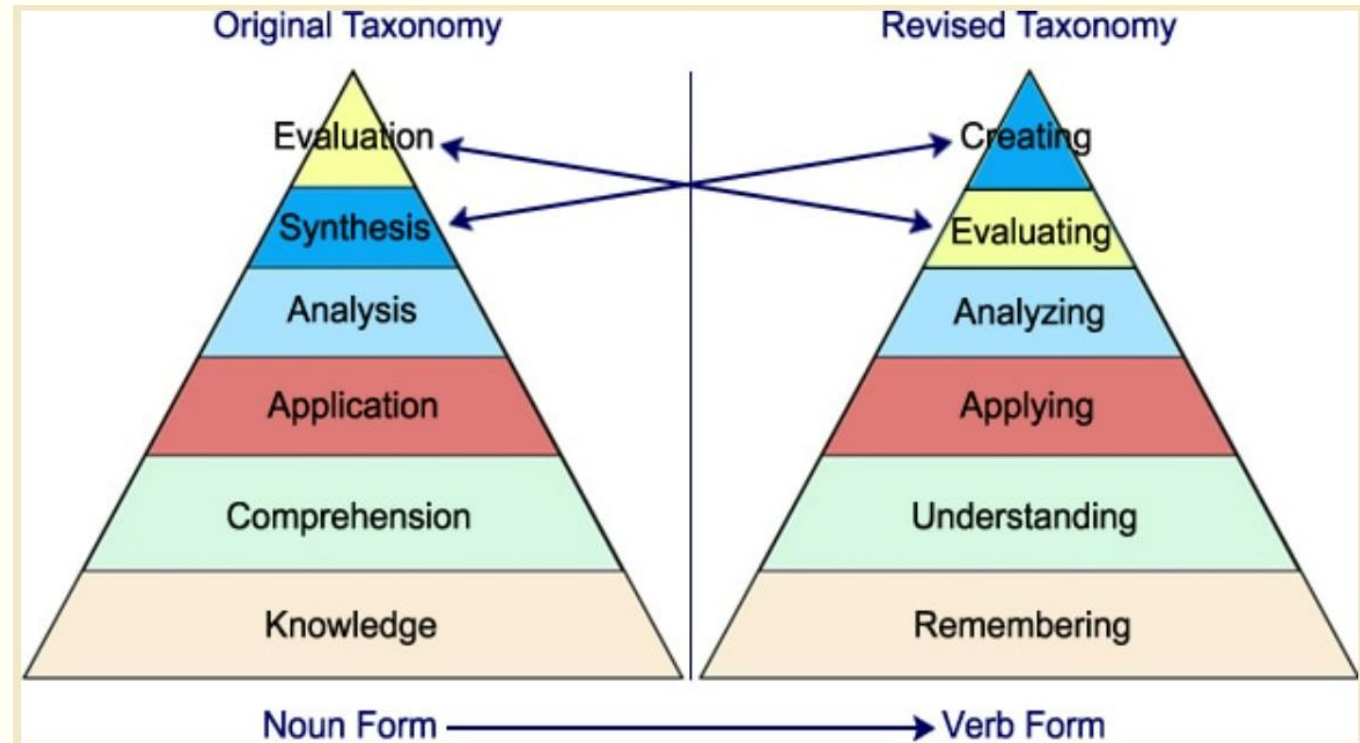
Confusions —Giving Students Practice in Identifying Confusions: “What was most confusing to me about the material explored in class today?”

Post assessments—Pushing Students to Recognize Conceptual Change: “Before this lecture, I thought such....., now I think....” Or how this lecture has changed my knowledge.

Reflection- Thinking about past failures, underperformance etc. and what should be done next time.

Bloom's (1956) taxonomies of learning and revised version by Anderson et al. (2001)

In higher education, the effective teacher should concentrate more on the higher orders of Bloom's taxonomy, where remembering is the lowest order and creating is the highest order.



Higher Order Thinking Questions



During the session, ask at least three higher-order-thinking ("HOT") questions to your students. This demonstrates that you provide tough challenges/assignments to all your students.



Examples: What can you infer _____? What can you point out about _____? What evidence in the text can you find that _____? What explanation do you have for _____?

Start the class with the students' participation



Do not make the Lecturing as the first thing.



Every class should begin with students' Essential Questions or general questions arising from the class's discussion.



QUESTIONS? COMMENTS? CONCERNS?



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