**SEMESTER I MODULE III**

**COGNITIVE PROCESSES**

**3.1. SENSATION**

Sensation is the starting point for all our psychological experiences. It is the stimulation of sensory receptors by a stimulus from the environment. It forms mere impressions just conveying information through sense organs. The process by which our senses gather information and send it to the brain is known as sensation. The formation of concepts starts with the process of sensation which is aroused by the excitation of a receptor stimulus. Sensations are disorganized, unrelated and meaningless. These must be organized, related to one another, and compared with previous sensations.

The first step in the process of sensation is stimulation which could be internal or external. The stimulus activates the receptors cells of the sense organ and neural impulses formed and travel to brain. Brain recognises and produce conscious sensations. Sensation always begins with stimulus. Continuous stimulation of receptors leads to sensory adaptation and prolonged stimulation diminishes sensory firing. Sensory capabilities can be measured.

**Types of sensation**

Human body’s senses are divided into 8 types:

**Visual (seeing)**

Light enters to the eyes through cornea, passes through the pupil, lens, and vitreous humour and forms the image on retina. The rod and cone cells of retina helps to identify the colours and the stimulation is converted to nerve impulses which pass through optical nerves and reaches the center of vision in the brain. Then brain recognises the object.

**Auditory (hearing)**

Sound waves are received by pinna, pass through ear canal, and strike on ear drum. The sound waves again travel through the bones of inner ear and vibrate the cochlea. The cochlea converts vibration in to electrical impulses which are transmitted to brain.

**Gustatory (taste)**

The taste is recognized by the taste buds situated deep in to the papillae. The chemical sensation stimulate the taste buds and carried to brain and recognise the taste.

**Olfactory(smell)**

Smell is received by the olfactory bulb and the message is travelled to brain through olfactory nerve. The brain understands the smell.

**Cutaneous(Touch)**

Touch is felt by nerves in the somatosensory system.

**Kinesthetic**

 It is the sense of posture and movement.it is also referred to as proprioception.

**Vestibular**

This is the sense of balance. It gives the awareness of the position, and movement of the head.

**Organic Sense**

The sensation only from the internal organs which includes certain physiological process like hunger, thirst, drowsiness etc:

**PERCEPTION**

This is the process by which we organise, integrate and recognize the various patterns of stimuli or processing of sensory inputs and give interpretation or meaning. It is a complex and active process which includes process of acquiring, interpreting, selecting and organizing sensory information. The word Perception is from Latin word-*Perception* or *percepio* which means receiving or collecting. The ability of perception gets developed gradually. Perception is always selective and it involves an organizing activity.

Sensation + Meaning = Perception

**Gestalt Psychology and Perception**

Gestalt psychologists consider the process of learning as an organized whole. A thing cannot be understood by the study of its constituent parts but only by the study of it as a totality is the basic idea behind this theory. In the practical sense Gestalt psychology is primarily concerned with nature of perception. A thing is perceived as a relationship within a field which includes the thing, the viewer and a complex background, incorporating the viewer’s purposes and previous experience. Gestalt psychologists are of the opinion that unless a person sees some meaning in that object s/he will pay little or no attention to it. Furthermore to them, the meaning of perception is always related to the total situation.

**Gestalt laws of Perception**

According to Gestalt psychologists our perceptual organization is governed by certain principles:

**Figure Ground Relationship**

To a large extent the nature of the object perceived is determined according to the background against which it is perceived. Objects which are outstanding in terms of colour, shape or size are prominent. Prominent object is the figure and background is referred as ground.

**Law of Pragnanz**

“Pragnanz” ( German word) means “good figure”. In this good figure means symmetrical, simple, regular, complete figures. When we see a visual, people will attempt to organize that information into the simplest form possible. People will mentally organize that visual to create a good figure.

**Law of Similarity**

1. Law of Proximity: Objects that are close together form a unit or a
2. Law of Continuity
3. Law of Closure

We have a tendency to fill the gaps or close the missing parts and complete the figure and to understand it. Our minds often ignore contradictory information and fills in the gap to complete the figure.

Things are often grouped together if they seem to complete some entity.

1. Law of Inclusiveness

A pattern that includes all the elements in the field is more outstanding than other patterns that are less inclusive in nature.

 Inclusive figures are perceived easily

 Has more advantage than other pictures

1. Law of Common fate

Objects which move in same direction or function in a similar manner will be perceived as a collective unit.

1. Law of Familiarity

Previous experience or familiarity determines the pattern of object being perceived.

**Factors influencing perception**

-Past experiences

-Learning

-Motives and emotions

-Maturation of sense organs

-Characteristics of the objects

-Beliefs, attitudes, interest, self-concept, expectations, etc:

**Types of perception**

1. Amodal Perception: The full perception of a physical structure when it is only partially perceived.
2. Colour vision: The capacity of an organism or machine to distinguish objects based on the wavelength of the light they reflect
3. Depth Perception: The visual ability to perceive the world in three dimension
4. Speech Perception: The process by which humans are able to interpret and understand the sound used in language.

**Illusion is wrong perception**

 Inaccurate perception of an existing sensory stimulus is illusion and

Hallucinations are distortions of sensory perceptions in which we perceive something without any appropriate stimulus or without any actual stimulus

(Perception without stimulation)

**Perception and education**

* It is the basis for learning through observation and imitation
* It initiates and sustains activity in reasoning and problem solving
* Memory and imaginations are not possible without perception
* Observation is regulated perception ,it is the core of scientific investigation and basis for systematic knowledge formation

**ATTENTION**

Attention is a process involving an act of listening, looking at, concentrating on a topic, object or event for the attainment of desired ends or it could be considered as a function.

**Definitions:**

* “Attention is the concentration of consciousness upon one object rather than upon another.” - Dumvile
* “Attention is the process of getting an object or thought clearly before the mind”. -Ross et al
* “Attention can be defined as a process which compels the individual to select some particular stimulus according to the interest and attitude out of the multiplicity of stimuli present in the environment.” -Sharma R.N.

Attention is a process carried out through cognitive abilities and helped by emotional and conditional factors to select something out of various stimuli present in one’s environment and then bring it in the center of one’s consciousness in order to perceive it clearly for deriving the desired ends.

**Nature of Attention**

* Attention is focusing of consciousness on a particular object: We see a number of things in the environment at a particular time and aware or conscious of many of them.
* Attention is constantly shifting/flexible/dynamic: Consciousness at a particular moment is divided in to two parts – central &marginal attention. Both these fields of perception or consciousness are interchangeable.
* Attention is selective: from the various stimulus from environment we give attention to a particular one based on our need, interest, attitude, usefulness, attraction etc:
* Attention is a state of preparedness or alertness: during the process of attention the individual goes through physical, mental or emotional preparedness/alertness to give appropriate response.

**Types of Attention**

Attention

Volitional

(by the exercise of will)

Non-Volitional

(No involvement of will)

Explicit

(by repeated

 act of will)

Implicit

(by single

 act of will)

Spontaneous

(by sentiment)

Enforced

(Sustained by instinct)

Factors affecting attention

* External factors:
	+ Nature of stimulus
	+ Intensity and size of the stimulus
	+ Contrast, change and variety
	+ Repetition of stimulus
	+ Movement of the stimulus
* Internal factors:
	+ Interest
	+ Motives
	+ Mental set-up
	+ Attitude
	+ Mental and physical state
	+ Value and purposefulness of the stimulus
	+ Prior experience and training
	+ Habits and temperament
	+ Instincts and emotions

Span of attention: defined in terms of quality, size or extent to which the perceptual field of an individual can be effectively organized in order to enable him/her to attend a number of things in a given spell of short duration.

* Span of attention for adults: 1/5 or 1/10 seconds exposure- 6-8 dots, letters, digits(for children 4-5)
* Arrangements in groups or shapes increases span of attention
* Simplicity, meaningfulness, familiarity, high intensity of stimulus and purposefulness/ value increases span of attention
* Time of exposure effect the span of attention
* Favorable and unfavorable environmental conditions affects san of attention.

**CONCEPTS IN THINKING**

A concept is the basic unit of all types of learning. A concept is a generalized idea about the thing, persons or events. Human beings from infancy to old age, learn new concepts and use old concepts in new situations their daily life. In one sense it is the general mental image of the objects events, experienced or perceived earlier.It is a collection of experiences or ideas that are grouped together based on some common properties. Language acquisition, experience, examples, environmental stimulations are helpful to form concept**.**

Sensation + Perception Concept

**Concept Formation:**

Three important phases are involved in concept formation. They are (1) Perception (2) Abstraction (3) Generalization. Several mental activities are essential for the formation of concepts.

1. Perception:

 The process of interpreting or giving meaning to sensation results in the formation of percepts. A percept is an organization of sensory experiences about a particular object. It may be stored in the memory and recalled in future to develop concepts.

2. Abstraction: It consists of analysis and comparison.

 Analysis: The perception is followed by the analysis of the characteristics of the objects or creatures perceived. For example the distinctive features of dogs which differentiate them from other living creatures are analyses because it is essential to form the concept of dog.

 Comparison: The comparison of the analyzed characteristics or features is made in order to have the knowledge of similarity and dissimilarity of various dogs.

3. Generalization:

 1. Synthesis: With the help of abstraction we synthesis the similar traits or features. When synthesis is done dissimilar qualities are disregarded. The generalization of the similar qualities is effected at this stage.

 2. Naming: This is the last step in the formation of a concept. At this stage the concept is given a name.

Elements of concept (Bruner):A concept consists of five elements:

1. A name / label
2. Examples
3. Attributes
4. Attribute value (essential & non-essential)
5. Rule / definition

**Types of Concepts:**

1. Concrete(Concepts about concrete things) and Abstract Concepts (Concepts about abstract things)
2. Classical or Definite (Traditional, classical, universal, uniform concepts) and Probabilistic Concept (Non-Traditional concepts)
3. Simple (The concept consist of a single feature or attribute or property) and Complex Concepts (The concept consist of two or more common features or attributes or properties)

Complex Concepts divided as:-

1. Conjunctive concepts: appropriate values of several attributes are jointly present. Eg:Read Fort
2. Disjunctive concept: the appropriate values of one attribute or of another attribute or both are present. Eg: Pencil, news paper
3. Relational Concept: has a specified relationship between attributes Eg: Boys hostel, milky white.

**Educational Implications:**

1. Concept formation depends on experience. Direct experience is better than vicarious or contrived experience. Therefore wherever possible direct experience should be provided to children.

2) Induction and deduction play a vital role in concept formation. The children are to be presented with a number of concrete examples and allowed to isolate essential attributes to form generalization. This inductive approach is essential for the formation of correct concepts. Sometimes a definition is given listing the common properties and the individuals then locate the particular members of the class. This deductive approach also assists in concept formation.

3) Concepts are developed and communicated through verbal symbols. Language is important. Pupils should be encouraged to express precisely their ideas orally and in written form.

4) Rote memorization is detrimental to concept formation. It should be discouraged.

* 1. **THINKING**

Thinking is a pattern of behaviour in which we make use of internal representations (symbols, signs etc.) of things and events for the solution of some specific, purposeful problem. Thinking is a cognitive activity. It is always directed towards achieving some purpose. It is a problem solving behaviour. There is a mental exploration in thinking and it is a symbolic activity.

Nature of Thinking

* It is essentially a cognitive activity
* It is a purposeful and goal directed behavior
* It is a problem solving behavior
* It involves mental exploration of images
* It is a symbolic activity
* It can shift over a span of time & space

**Tools of Thinking**

(1) Images - mental pictures, (2) Concepts, (3) Symbols & Signs, (4) Language, (5) Muscle activities, (6) Brain functions

 **Types of Thinking**

1. **Perceptual or concrete thinking:** Perceptual thinking is the simplest form of thinking and Perception (interpretation of sensation according to one’s experience) is the basis of this thinking. While, concrete thinking is carried out on the perception of actual or concrete objects and events.
2. **Conceptual or abstract thinking**:Conceptual thinking does not require the perception of actual objects or events but in abstract thinking one make use of concepts, symbols and language for solving problems.Concrete thinking does not have any depth. It just refers to thinking in the periphery and it is just regarding the facts. On the other hand, abstract thinking goes under the surface ie; down below the facts. It involves some mental process. Concrete thinkers only have a generalized concept for all things. But abstract thinkers have a very specific concept of things

To develop abstract thinking:

* + Search for *explanations* (e.g., *why* and *how* questions)
	+ Search for *analogies* to make the subject matter more understandable (e.g., “Let’s think about what this might be like in your life; what are other examples of this?”)
	+ Search for *alternative* *perspectives* (e.g., “Are there other ways to think about this? How might other people think about this?”)
	+ Ways to *organize* the topic and make connections (e.g., “I think there are three separate issues here that we should consider in order”; “Let’s try to think about what this might be connected to”)
	+ Ways to *evaluate* (e.g., “How can we decide if this is a good thing or not?”)
	+ Ways to *draw inferences* (e.g., “If this is true, then what else must be true?”)

3. **Reflective thinking or Logical Thinking:** It is the higher form of thinking aiming at solving complex problems. In this thinking all relevant experience are reorganized to find new ways of reacting to a situation and insightful approach is needed.in these method relevant facts are arranged in logical order in order to get the solution

1. **Convergent thinking:** Type of thinking that focuses on coming up with the single, well-established answer to a problem.it is appropriate in science, maths and technology Convergent thinking emphasizes speed, accuracy, and logic and focuses on recognizing the familiar, reapplying techniques, and accumulating stored information. Most effective in situations where an answer readily exists and simply needs to be either recalled or worked out through decision making strategies.It is oriented toward deriving the single best, or most often correct answer to a question. For example, multiple choice questions requiring convergent thinking.
2. **Divergent Thinking**: This type of thinking generate creative ideas by exploring many possible solutions.it is more suited to artistic pursuits. Divergent thinking typically occurs in a spontaneous, free-flowing manner, where many creative ideas are generated and evaluated.in this multiple possible solutions are explored in a short amount of time, and unexpected connections are drawn. Examples of divergent thinking include using [brainstorming](http://en.wikipedia.org/wiki/Brainstorming), [free writing](http://en.wikipedia.org/wiki/Free_writing) and [creative thinking](http://en.wikipedia.org/wiki/Creative_thinking). After the process of divergent thinking has been completed, ideas and information are organized and structured using convergent thinking. Divergent thinking is found among people with personality traits such as nonconformity, curiosity, willingness to take risks, and persistence. Activities which promote divergent thinking include creating lists of questions, setting aside time for thinking, meditation, brainstorming, subject mapping, keeping a journal, creating art work and free writing.
3. **Critical Thinking:** Type of thinking that helps a person in stepping aside from his own personal belief, prejudices and opinion to sort out the facts and discover the truth at the expense of his basic belief system. It involves challenging (higher order and well disciplined) thought process which involves the use of cognitive skills for arriving at unbiased and reliable judgment
4. **Creative thinking:** This is associates with one’s ability to create something new or unusual and involves manipulating mental representation to solve problems in a novel way. It is the ability to discover new solution to a problem or to produce new ideas, invention or works of art. It is the thinking pattern of scientists or inventors for a search of new relationship and associations to describe and interpret the nature of things, events and situations.

Characteristics of Creative Thinking

* It is an internal mental process
* Results in the production of something new
* Creative expression – source of joy and satisfaction for the creator
* Can be nurtured by training
* Involves divergent thinking
* Presence of various factors – originality, flexibility, divergent thinking, self-confidence and the ability to see and build relationships

Stages of Creative Thinking:

1. Preparation – Preparatory work on the problem. The problem is defined, the facts and material relevant to the solution are collected and examined.
2. Incubation – The problem is internalized and nothing appears externally to be happening.
3. Intimation - The creative person gets a feeling that a solution is on its way
4. Illumination or insight – The sudden appearance of the solution to the problem
5. Verification – The idea is verified, elaborated and applied

**To promote Creativity –**

* Proper organization of curriculum
* Use special techniques for fostering creativity – brain storming , models of teaching and gaming technique
* Teachers be the model for creative thinking
* Encourage self-expression
* Encourage originality and flexibility
* Removal of hesitation and fear
* Provide appropriate opportunities for creative expression
* Avoids blocks in creative thinking
* Use creative resources of the community

**Problem solving**

An individual has to face different kinds of problems in his life. It is the responsibility of a teacher to develop scientific attitude among pupils so that they can very easily tackle that problems they will have to encounter in future life. According to Gagne, problem solving is the highest level of learning in the hierarchy. A problem occurs wherever a goal-oriented activity is blocked by an obstacle that cannot be moved by the use of habitual responses.

According to John Dewey, efficient problem solving involves five major steps. It is not necessary that an individual should pass through all those steps in every problem.

1. Confrontation by a problem: The individual is blocked by an obstacle. He fails to meet the situation by the use of habitual responses. Thus he recognized the existence of the problematic situation.

2. Identification of the problem: The problem inspires the individual to think. His ability to identify the problem depends upon factors such as his general intelligence, and previous experiences. He should analyses the situation very well in order to find out the elements which are relevant to the solution of the problem. Then he can attach the problem.

3. Formulation of Hypotheses: A hypothesis is a possible plan of action to reach the goal. He gathers relevant information about the problem from different sources.

4. Rejection of the Hypotheses contrary to know facts: Hypotheses are tested against known facts. The correct hypotheses are selected.

5. Verification of the Hypotheses: The last step is the application of the hypothesis of the problem situation. The outcome is noted. If the obstacle is removed, the solution is accepted.

Role of the teacher: No universal law can be formulated for solving each and every type of problem. The classroom teacher can develop a scientific approach to solve problems which the students are expected to face in social life. Certain suggestions are being given for teachers which can prove useful in developing right attitude to approach a problem.

1. Moderate motivation: Extreme motivation or excessive emotional involvement in a problem hinders productive thinking. The teacher should crate moderate motivation in his students. If he finds that students show high motivation, he should drop the problem and return to it when finds students be in a calmer state but on the other hand motivation should be sufficient to sustain the interest of the class. The teacher can create motivation by utilizing various techniques.

2. Encourage divergent thinking: The teacher should not emphasize conformatory behaviour in his students. He should encourage divergent thinking in his students. Students should be encouraged to tackle problems in a variety of ways. He should also allow flexibility and original approach to problems. Reasoning should be developed through guided discussions in the class.

3. Problems should be presented as a whole: The teacher should present problems in the class as a whole so that students may have the perception of the total situation for the solution.

4. Level of difficulty: The teacher should see that the problems are too difficult for the class. S/he should keep in mind the maturation level and the level of the developmental task to create motivation in the students. The problem should create a moderate level of anxiety in the students.

5. Active Manipulation: The teachers should present a problem in a planned way. He should get the active involvement of the class in the process of solving a problem. Use of diagrams, figures and manipulation of concrete material should be made to conceptualize the abstract problems.

6. Practice: Teacher should give practice on problems of a great variety to develop proper mental set in his students to solve similar types of problems in future.

7. Incomplete solution: It has been proved that incomplete talks are retained more than complete. The implication of this is that teacher should never provide complete solutions to problems. Some unanswered questions should be left for the students for solution. The teacher can develop the spirit of the formulating tentative conclusions of the problems. He should make an effort to develop scientific attitude in his students.

**Metacognition**

Knowledge about one’s own cognitive system, thinking about one’s own thinking etc. are essential skill for learning to learn. Metacognition refers to higher order thinking which involves active control over the cognitive processes engaged in learning. 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 enables us to be successful learners. We engage in metacognitive activities every day.

The term ‘metacognition ‘ is most often associated with John Flavell (1979). It consists of both metacognitive knowledge and metacognitive experiences or regulation. Metacognitive knowledge refers to acquired knowledge about cognitive processes, knowledge that can be used to control cognitive processes. Flavell further divides metacognitive knowledge into 3 categories, knowledge of person variables, task variables and strategy variables. Knowledge of person variables refers to general knowledge about how human beings learn and process information as well as individual knowledge of one’s own learning process. Knowledge of task variables include about the nature of the task as well as the type of processing demands that it will place upon the individual. Knowledge about strategy variables include knowledge about both cognitive and meta cognitive strategies as well as conditional knowledge about when and where it is appropriate to use such strategies.

Metacognitive experiences involve use of metacognitive strategies or metacognitive regulation. Metacognitive strategies are sequential processes that one uses to control cognitive activities and to ensure that cognitive goal has been met.

Metacognition is defined as thinking about thinking. Cognitive strategies are used to help an individual to achieve a particular goal (eg. understanding a text). While metacognitive strategies are used to ensure that the goal has been reached (quizzing oneself to evaluate one’s understanding of that test). Self questioning is a common metacogntive strategy. Metacognition includes the ability to ask and answer the following types of questions.

1. What do I know about this subject, topic, issue, types of questions ?

2. Do I know what do I need to know. ?

3. How much time will I need to learn this? etc.

Metacognition is important in learning because it is helpful for successful learning and for the planning of learning activities, management of time and resources. Through the knowledge of metacognition students can apply their cognitive resources and take conscious control over learning.it motivates learner and reduce metal fatigue also helpful for effective memorization and retention.

**3.3. Forgetting**

Forgetting is the loss of ability to recall or recognize something. The different causes for forgetting are Inadequate impression, Laps of time, Interference of new learning, Repression, Emotional disturbance, Alteration of stimulus condition, Low IQ or Brain damage, Forgetting can occur at any memory stage, forgetting as encoding failure(Information never enters the long-term memory), Forgetting can result from failure to retrieve information from long-term memory.

**3.4. INFORMATION PROCESSING**

Memory is the learning that has persisted over time. Our ability to encode, store, and retrieve information is known as memory. It is the power of a person to store experiences and to bring them in to the field of consciousness sometime after experiences have occurred.

**Information Processing**

Cognition refers to the processes through which information coming from senses is “transformed, reduced, elaborated, recovered and used.” The term information refers to sensory input from the environment that informs us about something that is happening there. Cognitive processes are thus the mental processes involved in knowing about the world like perception, attention, thinking, problem solving and memory.

The information processing approach views mind as a complex, symbol - manipulating system that operates much like a computer. Information from the environment is encoded, or taken in by the system and retained in symbolic form. Then a variety of internal processes operate on it, recording it or revising its symbolic structure into a more effective representation and then decoding it or interpreting its meaning by comparing and combining it with other information in the system. When these cognitive operations are complete, output, in the form of a task solution, occurs.

**Memorization**

There are 3 distinct processes in memorization. These are encoding process, a storage process and a retrieval process. Encoding is the process of receiving sensory input and transforming it into a form, or code, which can be stored. Storage is the process of actually putting coded information into memory; and retrieval is the process of gaining access to stored, coded information when it is needed.

**Atkinson and Shiffrin Model of Information Processing**

The memory starts with a sensory input from the environment. This is held for a very brief time - several seconds at most - in a sensory register associated with sensory channels. (vision, hearing, touch and so forth). The immediate, initial recording of sensory information in the memory system is sensory memory. This first stage of memory stores an exact copy of incoming information for a few seconds and the information do not reach to the conscious part of man brain. The holding capacity is milliseconds in SM. Information that is attended to and recognized in the sensory register may be passed on to Short Term Memory (STM).It is the conscious memory which holds limited amount of information for a short period of time and focuses more on the processing of briefly stored information. STM contains new information and also information that has been retrieved from LTM. In STM the information is held for 20 to 30 seconds. Some of the information reaching STM is processed by being rehearsed - that is by having attention focused on it, perhaps by being repeated over and over or perhaps by being processed in some other way that will link it up with other information already stored in memory. Information that is rehearsed may then be passed along to Long Term Memory (LTM). Information not so processed is lost. When items of information are placed in long term memory, they are organized into categories, where they may reside for days, months, year, or for a lifetime. When we remember something, a representation of the item is withdrawn, or retrieved from LTM. LTM Storing information relatively permanently on basis of meaning and importance It is limitless storehouse of the memory system.



**Comparison of Short & Long Term Memory**

|  |  |
| --- | --- |
| *Short Term Memory* |  *Long Term Memory* |
| - Very fast input- Limited capacity- 20-30 seconds duration- Contains words, images, ideas, sentences- Immediate retrieval | - Relatively slow input- Practically unlimited capacity- Practically unlimited duration- Contains networks, schemata- Retrieval depends on connections |

**3.5. Techniques of Effective Memorization**

1. Use Mnemonics: They are artificial aids to memory. Mnemonic aids rely on linking, or association, of to-be remembered material with a systematic and organized set of images or words that are already firmly established in LTM and can therefore serve as reminder cues.

2. The Method of Loci: Loci means places. The memory pegs in this system are parts of your image of a scene. eg: kitchen, college etc.

3. Number and Letter Peg Systems: The main ‘idea is to establish, in the LTM, a well-organized set of images to which theto be remembered items can be linked.

4. Story: A list of unrelated words is related in a made up story.

5. Remembering Names and Faces:

 (1) Hear the name clearly, (2) Repeat the name, (3) Ask to spell it

6. Chunking: Systematic ways of encoding information

7.Association

 A thing should never be learnt in an isolated, insular manner. Present learning should be made to connect it with one’s previous learning and with many related things.

8. Form a Chain: Remember lists in order, forming an exaggerated association connecting item one to two, and so on.

9. Take a Mental Walk: Mentally walk along a familiar path, placing objects or ideas along the path.

10. Use a system.

11. Keyword Method: Memory aid; using a familiar word or image to link two items

12. Link Method: Involves forming a mental image of items to be remembered in a way that links them together.

13. Acronyms: using first letter of each word to form a memorable word. Eg: “*VIBGYOR”*

14. Acrostic: form new sentence

15. Hierarchy formation: Complex information broken down into broad concepts and further subdivided into categories and subcategories.

16. Making the content matter meaningful by Relating to previous knowledge, Relating to students’ experiences, Clarifying unfamiliar terms, Give examples, illustrations, analogies from students’ view, Using humor, emotion, novelty etc:

**To improve memory:**

* Activate retrieval cues--mentally recreate situation and mood
* Recall events while they are fresh-- before you encounter misinformation
* Minimize interference
* Test your own knowledge
	+ By Rehearse
	+ Determine what you do not yet know
* Knowledge of Results: Feedback allowing you to check your progress
* Recitation: Summarizing aloud while you are rehearsing material
* Rehearsal: Reviewing information mentally (silently)
* Elaborative Rehearsal: Look for connections to existing knowledge
* Selection: Selecting most important concepts to memorize
* Organization: Organizing difficult items into *chunks;* a type of *reordering*
* Whole Learning: Studying an entire package of information at once, like a poem
* Part Learning: Studying subparts of a larger body of information (like text chapters)
* Progressive Part Learning: Breaking learning task into a series of short sections
* Serial Position Effect: Making most errors while remembering the *middle* of the list
* Overlearning: Studying is continued beyond bare mastery
* Learn from general to specific
* Create associations
* Study actively
* Visualize relationships between different concepts
* Be aware of your attitude
* Combine senses: use maximum number of senses in learning activity
* Use the material as many different ways you can:prepare charts, concept map, models etc:

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