College of Engineering
Department of Interior Design

Design Methodology

4th year – 1nd Semester

M.S.C. Madyan Rashan

Room No. 313

Academic Year 2018-2019

	Course Name	History of Interior Design
	Course Code	INDS 315
	Lecturer in Charge	Asst. Lecturer
	Department/College	Interior Design / Engineering
	Contact information	e-mail: madyan.maher@gmail.com madyan.maher@ishik.edu.iq
	Time(in hours) per week	Theory: 2 h.
	Keywords	Thinking, Reasoning, Logic.
	Objectives: At the end of this lecture, the students should be able to: Establish basic concepts about **Thinking.**	

Week	Lecture Date	Number of hours	Topic
1	2/10/2018	3 h	Introduction, course overview
2	9/10/2018	3h	Design as process
3	16/10/2018	3h	Route maps of the design process
4	23/10/2018	3h	The multi-dimensional design problem
5	30/10/2018	3h	Problems, solutions and the design process
6	**6/11/2018**	**3h**	**Thinking**
7			Imagination
8			Creative thinking
9			Creative thinking
10			Design tactics
11			**Design tactics**
12			
13			

- **Previous lecture**
- Design problems
- The design process

Course Reading List and References:

- How Designers Think

  by Bryan Lawson

College of Engineering
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Thinking

Types and styles of thinking

- The history of cognitive psychology reveals many conflicting views about the nature of thought and the thought process from the most mechanistic to the most mythical.
- There is the use of the word ‘think’ which we apply to the act of concentrating or simply paying attention, as when we say ‘think what you are doing’.
- There is the use of the word to mean belief as when someone says what they ‘think’.

Theories of thinking

- So much has been written about the phenomenon of thought and the business of thinking by philosophers and psychologists that we cannot possibly do justice to the subject here.
- **Cognitive psychology** is one of the most problematic fields of science since it involves investigation of something we cannot see, hear or touch.
- In fact the 'behaviourist' theories of thinking hardly admitted that thinking was **any more than very mechanistic behaviour which just happened to go inside the head**.

Types of thinking

- There are many types of thinking and concluded that **reasoning and imagining** were probably the most important to designers.
- Reasoning is considered **purposive** and **directed** towards a particular conclusion.
- This category is usually held to include logic, problem-solving and concept formation.
- When 'imagining', on the other hand, the individual is said to draw from his or her own experience, combining material in a relatively unstructured and perhaps aimless way.
- Artistic and creative thought as well as daydreaming are normally considered imaginative.

Types of thinking

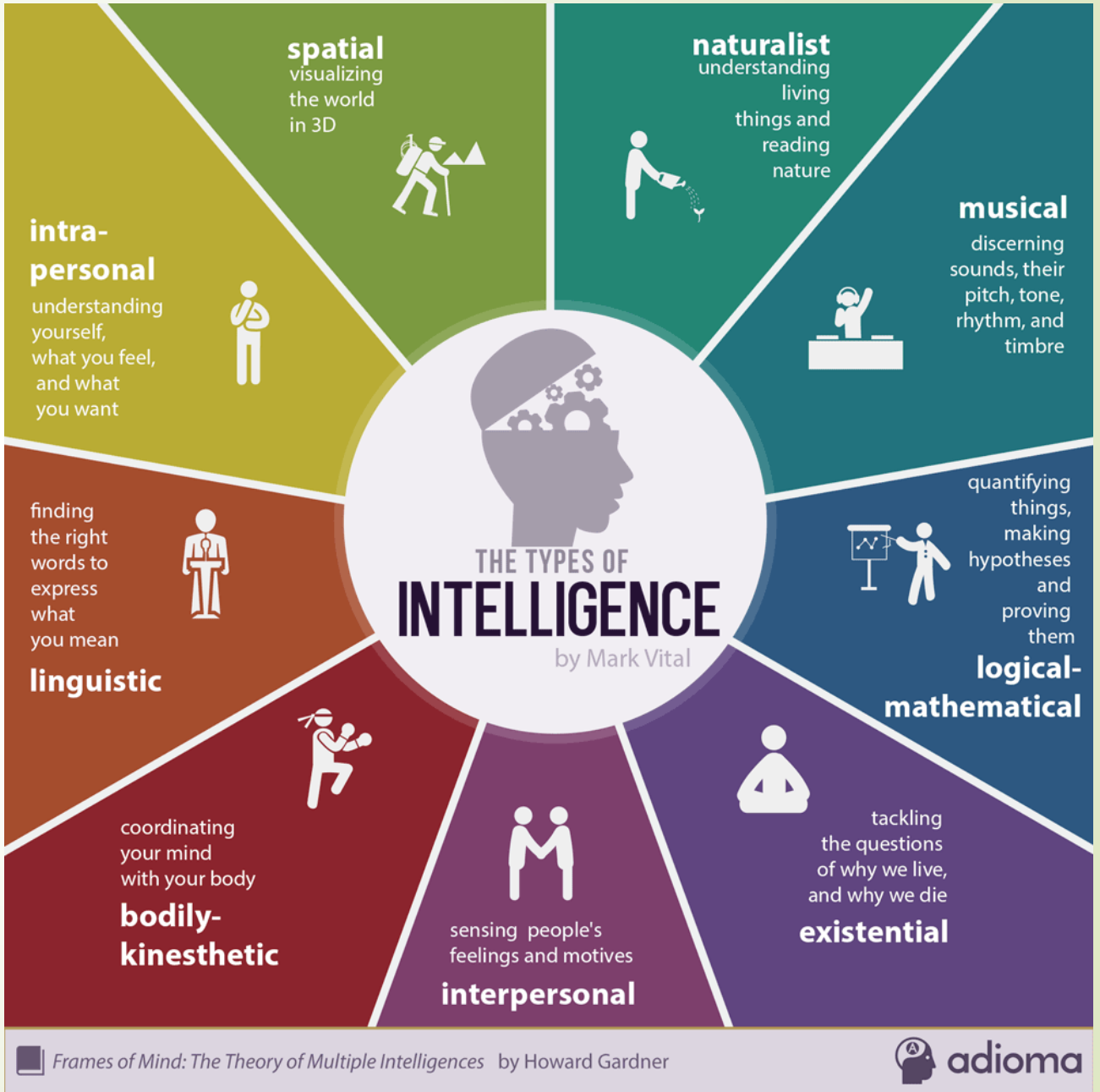
- Murphy suggested that mental processes are **bipolar**, being influenced both by the external world and by inner personal needs.
- Problem-solving obviously requires more attention to the demands of the external world than to inner mental needs.
- In imaginative thinking, on the other hand, the individual is primarily concerned with satisfying inner needs through cognitive activity which may be quite unrelated to the real world.

Types of thinking

- This seems to offer a psychological distinction which parallels that between **design and art**.
- Design is directed towards solving a real world problem while art is largely self-motivated and centres on the expression of inner thoughts.
- This does not mean that imaginative thought can be excluded from the design process but that its product will probably always need evaluation by rational thought in order that the designer's work should be relevant to the real-world problem.
- The control and combination of rational and imaginative thought is one of the **designer's most important skills**.

Human intelligence

- A very popular approach to the study of human intelligence is represented by the **factorial school**.
- This work holds that human intelligence is not a simple factor but rather a whole series of related factors each of which may be present to greater or lesser extents in any individual.



Human intelligence

- Intelligence is an ability to act directionally, think rationally, and face the environment effectively.
- Guilford concluded that intellectual factors could be divided into the two major groups of **thinking and memory**.

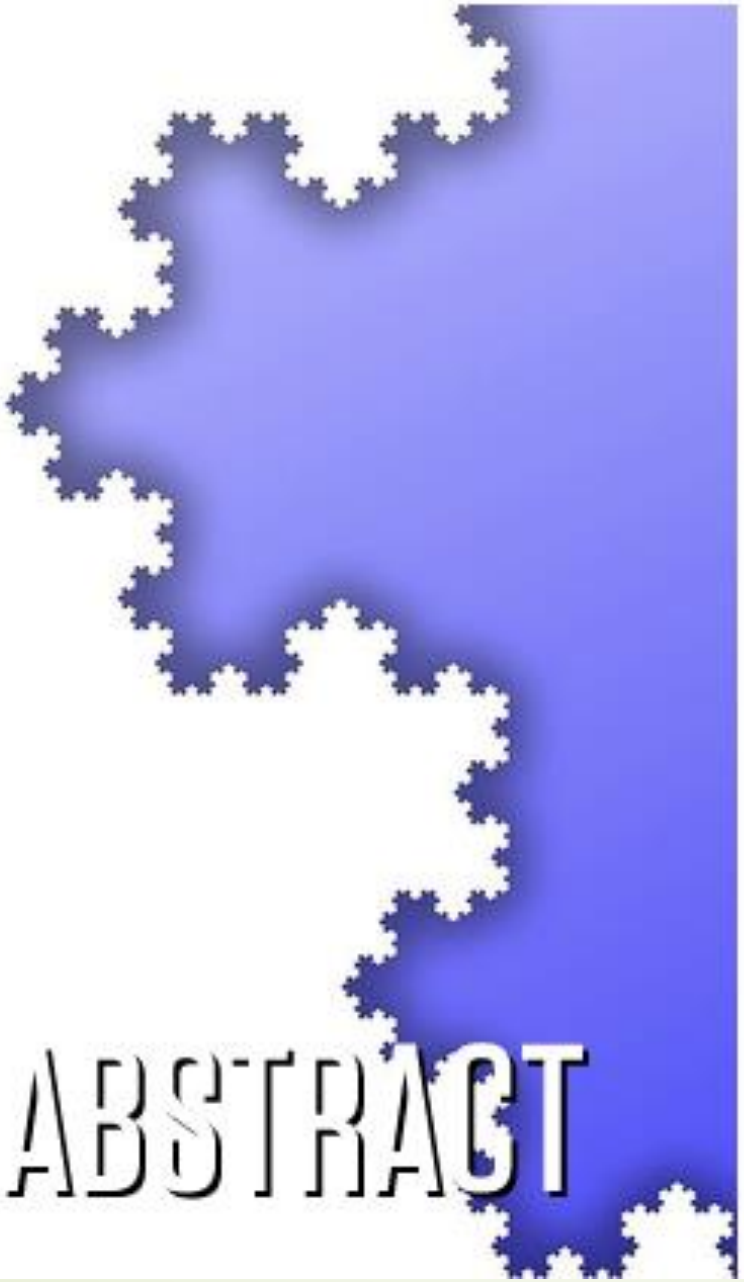
Types of thinking

- 1.Perceptual or concrete thinking
- 2.Conceptual or abstract thinking
- 3.Creative thinking
- 4.Logical thinking/ reasoning
- 5.Problem solving
- 6.Convergent Vs Divergent thinking

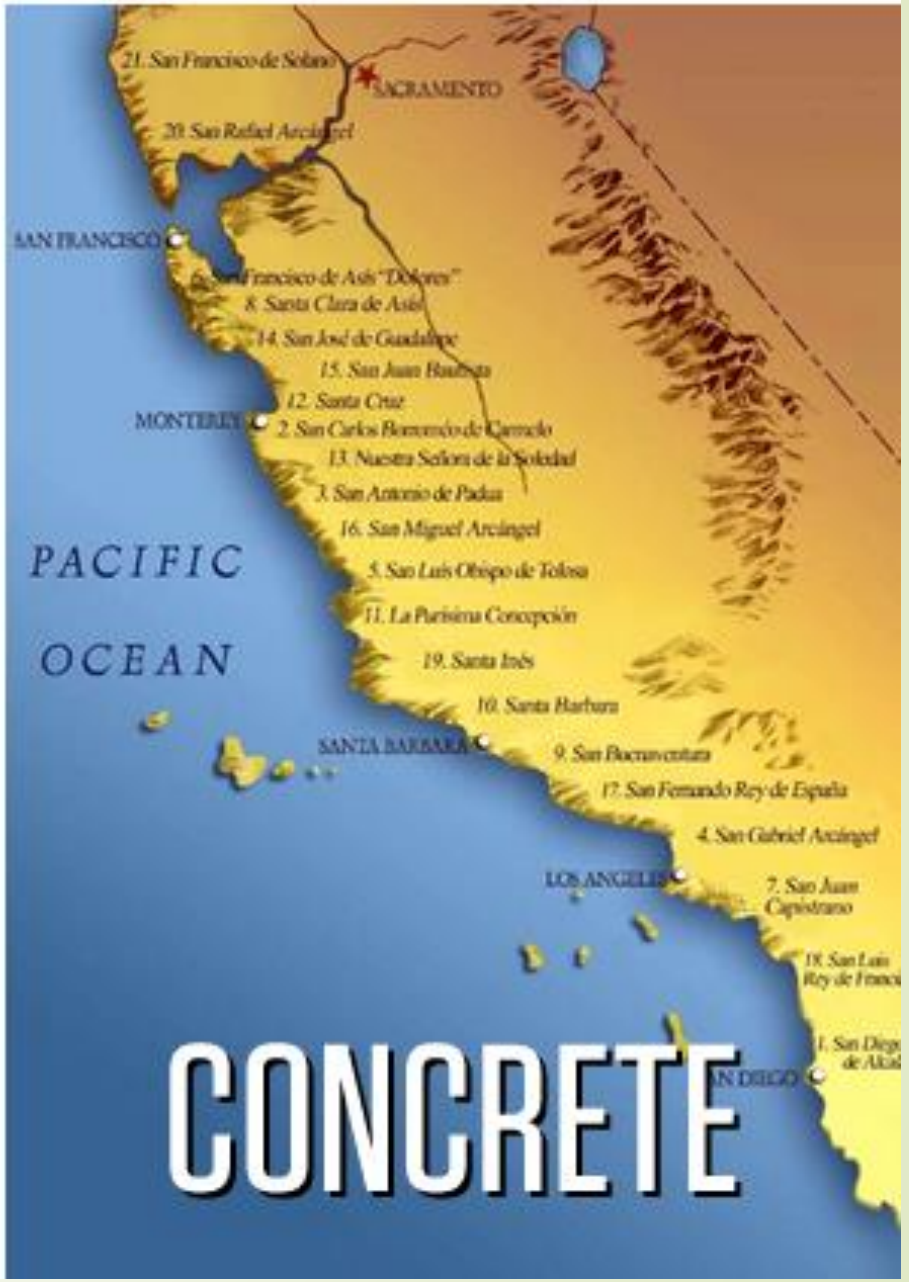
Perceptual or concrete thinking

- It is based on perception.
- Perception is the process of interpretation of sensation according to one's experience.
- It is also called concrete thinking as it is carried over the perception of actual or concrete & events.
- It is one-dimensional & literal thinking which has limited use of metaphor without understanding nuances of meaning.
- Being the simplest form of thinking, small children are mostly benefitted by this type of thinking.

What is the perimeter?



How long is the coastline?



- **Conceptual or abstract thinking**
- It does not require the perception of actual objects or events.
- It is also called abstract thinking as it makes the use of concepts or abstract ideas.
- It is superior to perceptual thinking's as it economizes efforts in understanding & helps in discovery & invention.
- It is ability to appreciate nuances of meaning.
- It is multidimensional thinking with ability to use metaphors & hypotheses appropriately.
- Language plays an important part in conceptual thinking.

- **Conceptual or abstract thinking**
- Great minds discuss ideas; average minds discuss events; small minds discuss people.

Creative thinking

- It refers to the ability for original thinking, to create or discover something new.
- It is the ability to integrate the various elements of the situation into a harmonious whole to create something novel.
- In other words, cognitive activity directed towards some creative work refers to creative thinking.
- Creative thinkers are great boons to the society as they enrich the knowledge of mankind.
- The creative thinker tries to achieve something new, to produce something original & something unique

Logical thinking / Reasoning

- It is the cognitive process of looking for reasons for beliefs, conclusion, actions or feelings.
- It is the process of drawing conclusions based on evidence.
- It is form of controlled thinking in which the thought process is directed consciously towards the solutions of a problem.
- Reasoning is the highest form of thinking to find out causes & predict effects.
- An individual tries to solve a problem by incorporating two or more aspects of his past experience.

- It is classified into:
- **I. Inductive reasoning:**
- This is process of reasoning from parts to the whole, from example to generalizations. It is carried out generally within the field known as informal logic or critical thinking.
- In inductive inference, we go from the specific to the general. We make many observations, discern a pattern, make a generalization, and infer an explanation or a theory.
- "The coin I pulled from the bag is a penny. That coin is a penny. A third coin from the bag is a penny. Therefore, all the coins in the bag are pennies."
- Even if all of the premises are true in a statement, inductive reasoning allows for the conclusion to be false. Here's an example: "Harold is a grandfather. Harold is bald. Therefore, all grandfathers are bald." The conclusion does not follow logically from the statements.

II. Deductive reasoning:

- This moves from the whole to part, from generalization to underlying concepts to examples. Formal logic is described as “the science of deduction. ”All men are mortal. Harold is a man. Therefore, Harold is mortal.
- The scientific method uses deduction to test hypotheses and theories. "In deductive inference, we hold a theory and based on it we make a prediction of its consequences.
- Deductive reasoning usually follows steps. First, there is a premise, then a second premise, and finally an inference. A common form of deductive reasoning is the **syllogism**, in which two statements — a major premise and a minor premise — reach a logical conclusion. For example, the premise "Every A is B" could be followed by another premise, "This C is A." Those statements would lead to the conclusion "This C is B." Syllogisms are considered a good way to test deductive reasoning to make sure the argument is valid.

II. Deductive reasoning:

- Inductive reasoning has its place in the scientific method.
- Scientists use it to form hypotheses and theories.
- Deductive reasoning allows them to apply the theories to specific situations.

III. Abductive reasoning:

- It is cognitive process often involves both inductive & deductive arguments.
- Another form of scientific reasoning that doesn't fit in with inductive or deductive reasoning is abductive.
- Abductive reasoning usually starts with an incomplete set of observations and proceeds to the likeliest possible explanation for the group of observations.
- For example, a person walks into their living room and finds torn up papers all over the floor. The person's dog has been alone in the room all day. The person concludes that the dog tore up the papers because it is the most likely scenario. Now, the person's sister may have brought by his niece and she may have torn up the papers, or it may have been done by the landlord, but the dog theory is the more likely conclusion.

III. Abductive reasoning:

- Abductive reasoning is useful for forming hypotheses to be tested.
- Abductive reasoning is often used by doctors who make a diagnosis based on test results and by jurors who make decisions based on the evidence presented to them.

Problem Solving

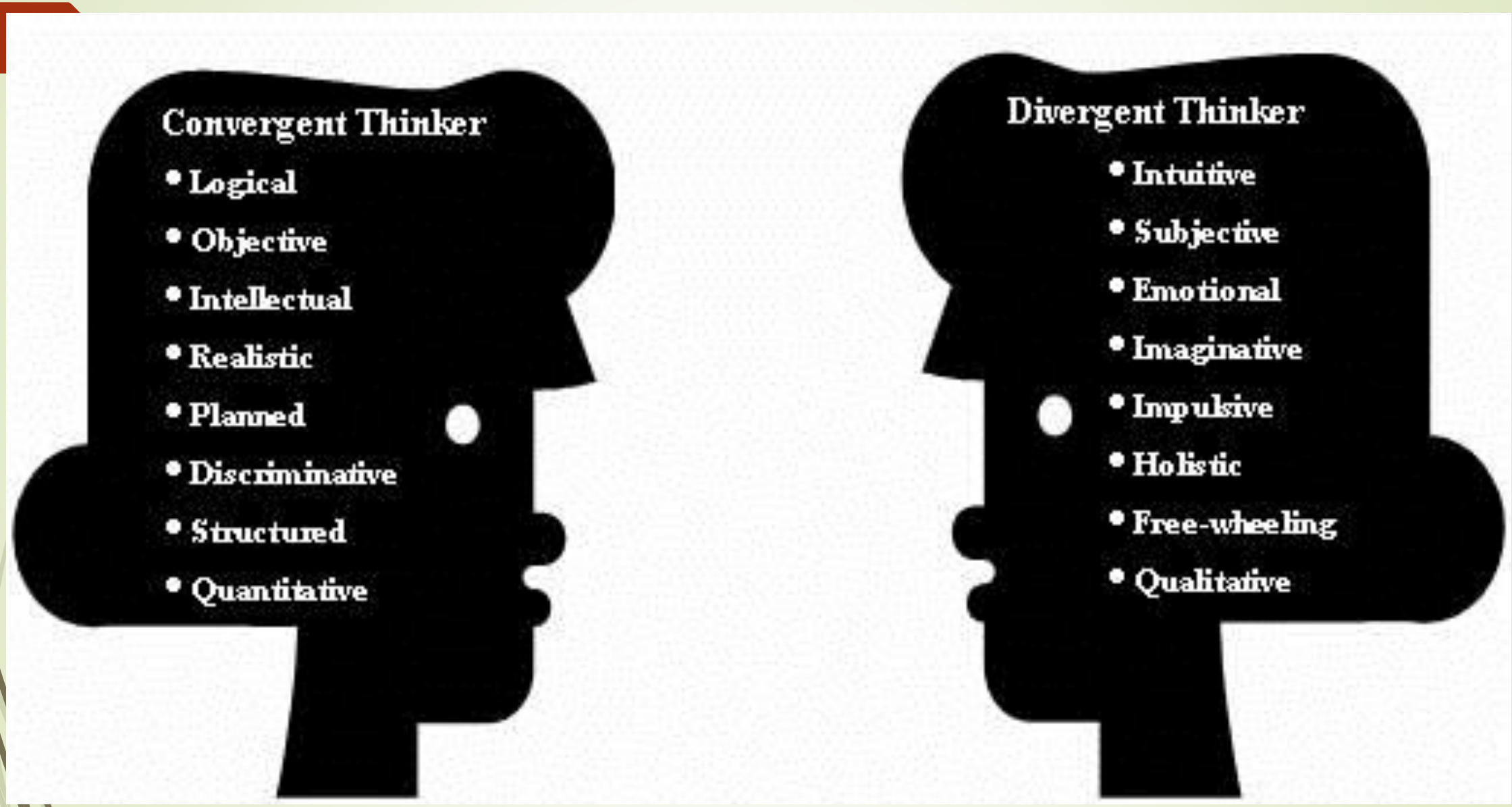
- It is a tool, skill & a process.
- It is a tool because it can help you solve an immediate problem or to achieve a goal.
- It is a skill because once you have learnt it you can use it repeatedly, like the ability to ride a bicycle, add numbers or speak a language.
- It is also a process because it involve taking a number of steps.
- You can engage in problem solving if you want to reach a goal & experience obstacles on the way.
- At the point at which you come up against a barrier you can engage in a problem solving process to help you achieve your goal.

Convergent and Divergent thinking

- Convergent thinking is cognitive processing of information around a common point, an attempt to bring thoughts from different directions into a union for common conclusion
- The process of figuring out a concrete solution to any problem, The process is **straightforward** and focuses on pinpointing a single most effective answer to a problem.
- Variety of tests, such as multiple choice tests, standardized tests, quizzes, spelling tests and similar other tests require convergent thinking, because only one answer can be 100% correct.

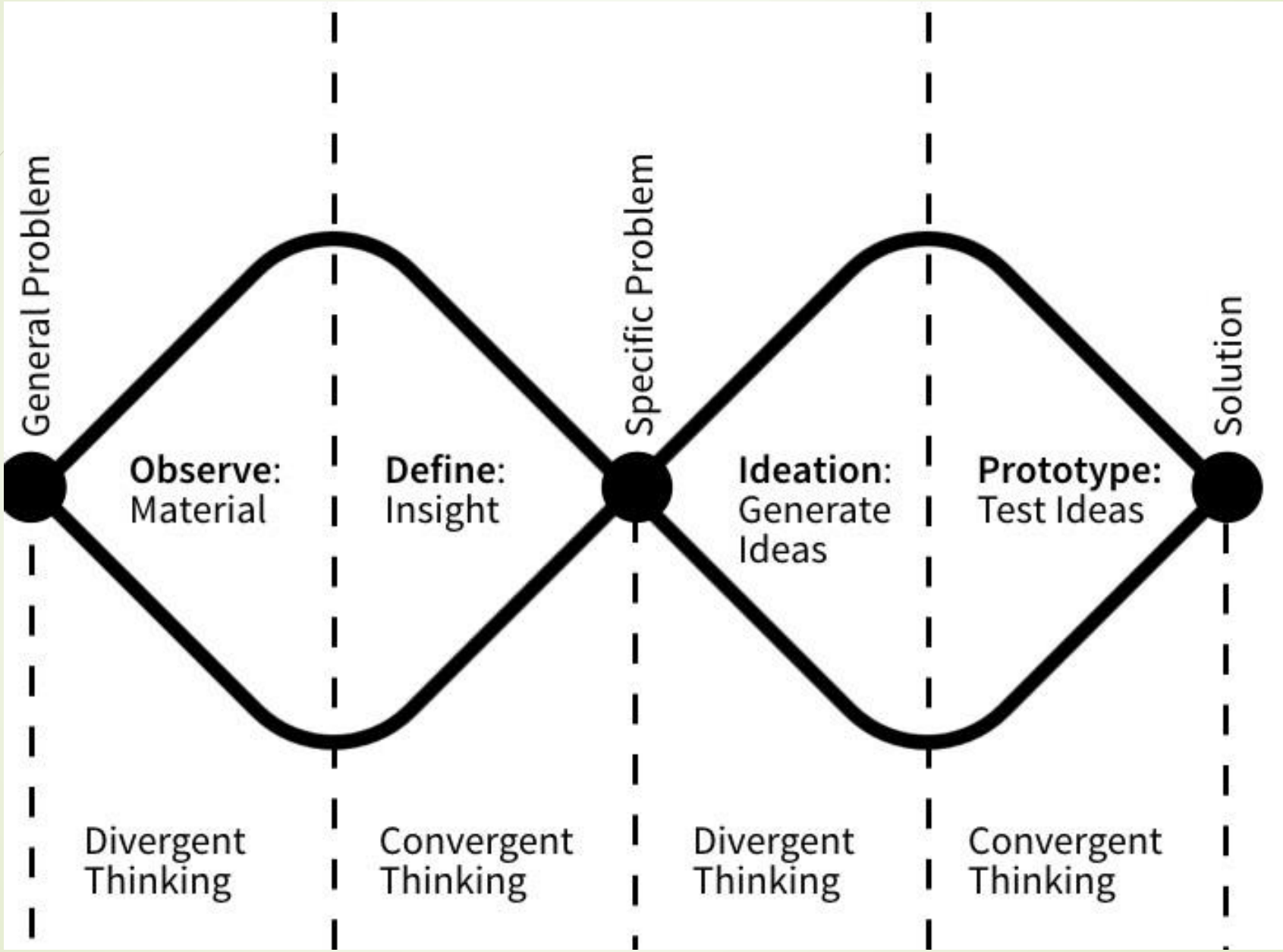
Convergent and Divergent thinking

- Divergent thinking starts from a common point & moves outward into a variety of perspectives. EX; teachers use the content as a vehicle to prompt diverse or unique thinking among students rather than a common view.
- Is the process of thinking that explores multiple possible solutions in order to generate creative ideas.
- For instance, processes like brainstorming, creative thinking and free writing are parts of divergent thinking applied **at the beginning of a problem solving process.** Various solutions produced by the method can be used to sort out the best possible answer thereafter.


Convergent Thinker
• Logical
• Objective
• Intellectual
• Realistic
• Planned
• Discriminative
• Structured
• Quantitative
Divergent Thinker
• Intuitive
• Subjective
• Emotional
• Imaginative
• Impulsive
• Holistic
• Free-wheeling
• Qualitative

Convergent and Divergent thinking

- Design clearly involves both convergent and divergent productive thinking and studies of good designers at work have shown that they are able to develop and maintain several lines of thought in parallel.


General Problem
Observe:
Material
Define:
Insight
Specific Problem
Ideation:
Generate
Ideas
Prototype:
Test Ideas
Solution
Divergent
Thinking
Convergent
Thinking
Divergent
Thinking
Convergent
Thinking


Take
A Break


QUIZ
TIME!

Group “A”

- Bryan Lawson, proposed his own design process map, Talk about this model with examples and sketches.

Group “B”

- What are the main function of design constraints ? Mention at least one example for each function.


THANK
YOU
FOR
YOUR
ATTENTION