



Meaning, Nature, Concept Formation

# CONCEPTS

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# Concepts

- Concepts are categories of objects, events, or ideas with common properties
  - Formal concept
    - Clearly defined by a set of rules or properties
    - All members have all defining properties and nonmembers don't
  - Natural concept
    - No fixed set of defining features but has typical or characteristic features
    - A member that possesses all or most of its characteristic features is called a prototype

# *What is a Concept?*

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(Johnson & Rising, 1972)

A Concept is **mental abstraction of common properties** of a set of experience or phenomena

Ausubel (1968) – **concept formation**

Concept as abstraction from experience involving examples of concepts

Hunt, Martin, Stone (1966) – **concept assimilation**

A concept is **a decision rule** which, when applied to the description of an object, specifies whether or not a name can be applied.

Henderson (1970)

Verbal concepts are those for which a conventional name or **designating expression** exists, they are learned by concept assimilation or by definition – e.g. rhombus, polygon, variable, mean

Non-verbal concepts **are learned by concept formation or by abstraction from example** – e.g. number, time, color, space

# **According to National Curriculum framework – 2005**

**The main goal of mathematics education in schools is**

**“Mathematise the child’s thought process”**

**Clarity of thought and developing students’ mind is main necessarily of this process.**

**There is a need to develop the inner resources of a growing child, to make him able to think and work in a proper way.**

# TYPES OF CONCEPTS


- ⦿ There are two types of concepts
  - *Natural concepts*: imprecise mental classifications that develop out of our everyday experiences.
    - Most of the concepts in our everyday life
  - *Artificial concepts*: concepts defined by a set of rules or characteristics, such as dictionary definition or mathematical equations.
    - Most of the concepts learned in school

# Nature of Concept:

- ❖ A concept is not static, it is always changing. For example first a child considers even the walls and doors to be living things. Then it understands they are nonliving, considers cars, buses and running objects to be alive. Later, it learns that only animals and plants are living.
- ❖ The concept is not common for all, different persons may have different concept about the same object / events.
- ❖ Concept is a part of thought process.
- ❖ Concept can be formed without the use of language.
- ❖ Concept formation is the association of certain stimuli and responses.
- ❖ Concept is the process of discrimination of the common features.
- ❖ Concepts are very useful in recognizing, naming and identifying the objects / persons / events.



## Understanding of concept helps to answers the questions in following ways:

- What is the structure of the object to be understood?
  - What ways of understanding exist for each concept?
  - What are possible and desirable aspects or components of mathematical concept for students to learn at a given time and under circumstances?
  - How are these components developed?
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# What is **Concept formation** ?

- **Concepts** are the categorization of objects, events, or people that share common properties.
- By using concepts, we are able to organize complex notions into simpler, and therefore more easily usable forms.
- **Concept formation** is the process by which we learn to form classes of things, event, people, etc.
- According to Piaget & Vygotsky → children form their own concepts through **experience, assimilate** existing concepts such as cultural values, norms & beliefs from adults → then further create and develop their own concepts as they mature toward adulthood.





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# Concept Formation

- is a classification activity that leads the students to use item characteristics for classification.
- It develops their abilities to observe items thoroughly and to make useful observations.
- It also helps them to discover methods of classification.

# Types of Concept Formation

- 1. *Direct Experience:*** It is the first type of concept formation, in which the learner develops concept through direct experience with the particular objects / persons / events. It is developed during from the early childhood onwards. For example, the concept about cow.
- 2. *Indirect Experience:*** Here the learner develops concept through pictures, photos and reading descriptions, hearing from other. For example, the concept about Kangaroo.
- 3. *Faulty Concepts:*** The concepts or the general ideas we have about the objects, persons or events, are not always adequate and accurate. Small children have so many concepts that are quite erroneous and inadequate. For example, one's anxiety over the crossing of his way by a cat or one's feeling of hatred towards the person belonging to other caste or religion is the result of faulty concepts. Faulty concepts should not be allowed to develop in children.

# Process of Concept Formation:



The process of concept formation has three important phases.

- 1. Perception:** Experiences or learning in any form is the starting point of the process of concept formation. Our perceptions or imaginary experiences, formal or informal learning, provide opportunities for getting mental images of the objects, persons or events.
- 2. Abstraction:** The mind analyses the perceived images and synthesizes what is common to all, neglecting what is particular. This process of observing similarities and commonness is named as abstraction.
- 3. Generalization:** After making such observation in the form of abstraction for a numbers of times the child is able to generalize or form a general idea about the common properties of some objects or events. On account of this generalization, he will develop a concept about these things or events.

# Concept Formation:



- ★ For example, the child perceives a black cow at the first time and is told that it is a cow, he tries to form an idea about it. In the beginning the idea is very particular in nature.
- ★ Later on, when he perceives a white or red cow he does not at once, call it a cow. He again makes an enquiry and comes to that these are cows. He tries to compare the particular mental image the idea of the previously perceived cow with the images he is having, at present, by perceiving white and red cows.
- ★ In this way he compares and contrasts the similarities or dissimilarities of his mental images related to all perceived cows. In spite of the differences in colour, appearance etc., they are found to possess so many common properties or characteristics.

Thank You

