

Piaget's Cognitive Development Theory

Cognition

- All the mental activities associated with thinking, knowing, and remembering.
- Children think differently from adults.

Piaget's Theory

Piaget was originally trained in the areas of biology and philosophy and considered himself a “*genetic epistemologist*.”

He was mainly interested in the biological influences on “how we come to know.”

Piaget's Theory

Piaget believes that what distinguishes human beings from other animals is our ability to do
“abstract symbolic reasoning.”

Jean Piaget

- (1896–1980) Swiss psychologist who became a leading theorist in 1930's
- Developmental psychologist who introduced a 4 stage theory of cognitive development
- Stages are BIOLOGICAL and occur in same order but environment & culture can change how fast we progress through them.
- Children actively try to make sense out of their environment rather than passively soaking up information about the world.

Piaget's Theory of Cognitive Development

- Piaget believes that “children are active thinkers, constantly trying to construct more advanced understandings of the world”
- These “understandings” are in the form of structures he called *schemas*

Schemas

- Concepts or mental frameworks that people use to organize and interpret information
- A person's "picture of the world"

Assimilation

- Interpreting a new experience within the context of one's existing schemas
- The new experience is similar to other previous experiences

Accommodation

- Interpreting a new experience by modifying or changing one's existing schemas
- The new experience is so novel that the person's schemata must be changed to accommodate it

Assimilation/Accommodation



**Two-year-old Jocelyn
has learned the schema
for "dog" from her
picture books.**

Assimilation/Accommodation



Two-year-old Jocelyn has learned the schema for "dog" from her picture books.



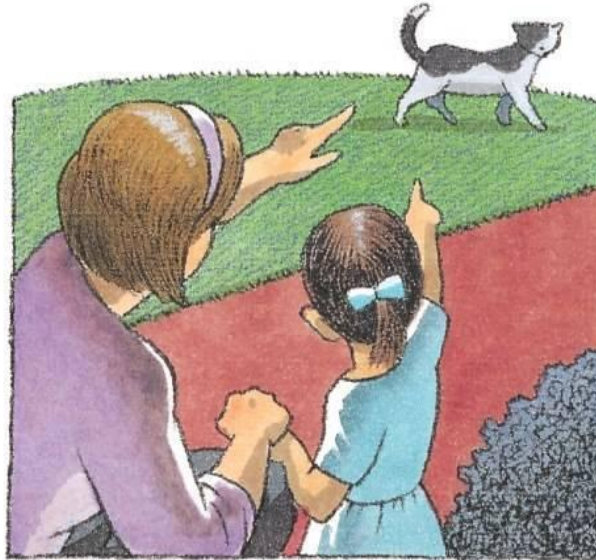
Jocelyn sees a cat and calls it a "dog." She is trying to assimilate this new animal into an existing schema. Her mother tells her, "No, it's a cat."

Assimilation/Accommodation

As children assimilate new information and experiences, they eventually change their way of thinking to accommodate new knowledge



Two-year-old Jocelyn has learned the schema for "dog" from her picture books.



Jocelyn sees a cat and calls it a "dog." She is trying to assimilate this new animal into an existing schema. Her mother tells her, "No, it's a cat."



Jocelyn accommodates her schema for 4-legged animals and continues to modify that schema to include different kinds of dogs and cats in the neighborhood.

Piaget's Approach

- Primary method was to ask children to solve problems and to question them about the reasoning behind their solutions
- Discovered that children think in radically different ways from adults
- Proposed that *development occurs as a series of 'stages' differing in how the world is understood*

Piaget's 4 Cognitive Developmental Stages

1. **Sensorimotor stage,**
 - from birth to age 2
 2. **Preoperational stage,**
 - from age 2 to age 7
 3. **Concrete operational stage,**
 - from age 7 to age 11
 4. **Formal operational stage,**
 - begins during adolescence and continues into adulthood.
- Each new stage represents a fundamental shift in how the child thinks and understands the world.

Sensorimotor Stage (birth – 2)

- Information is gained directly through the senses and motor actions.
- In this stage child perceives and manipulates but does not reason.
- Symbols become internalized through language development.
- Object permanence is acquired – the understanding that an object continues to exist even if it can't be seen.

Object Permanence

- The awareness that things continue to exist even when they cannot be sensed.
- Occurs as babies gain experience with objects, as their memory abilities improve, and as they develop *mental representations of the world*, which Piaget called schemas.

Object Permanence

Before 6 months infants act as if objects removed from sight cease to exist

Can be surprised by disappearance/reappearance of a face (peek-a-boo)
“Out of sight, out of mind”



Preoperational Stage (2–7 years)

- The word *operations* refers to logical, mental activities; thus, the *preoperational* stage is a *pre-logical* stage .
- Children can understand language but not logic
- Emergence of **symbolic thought** – ability to use words, images, and symbols to represent the world.
- **Centration** – tendency to center, on only one aspect of a situation, usually a perceptual aspect, and ignore other relevant aspects of the situation.
- **Egocentrism** – inability to take another person's perspective or point of view.

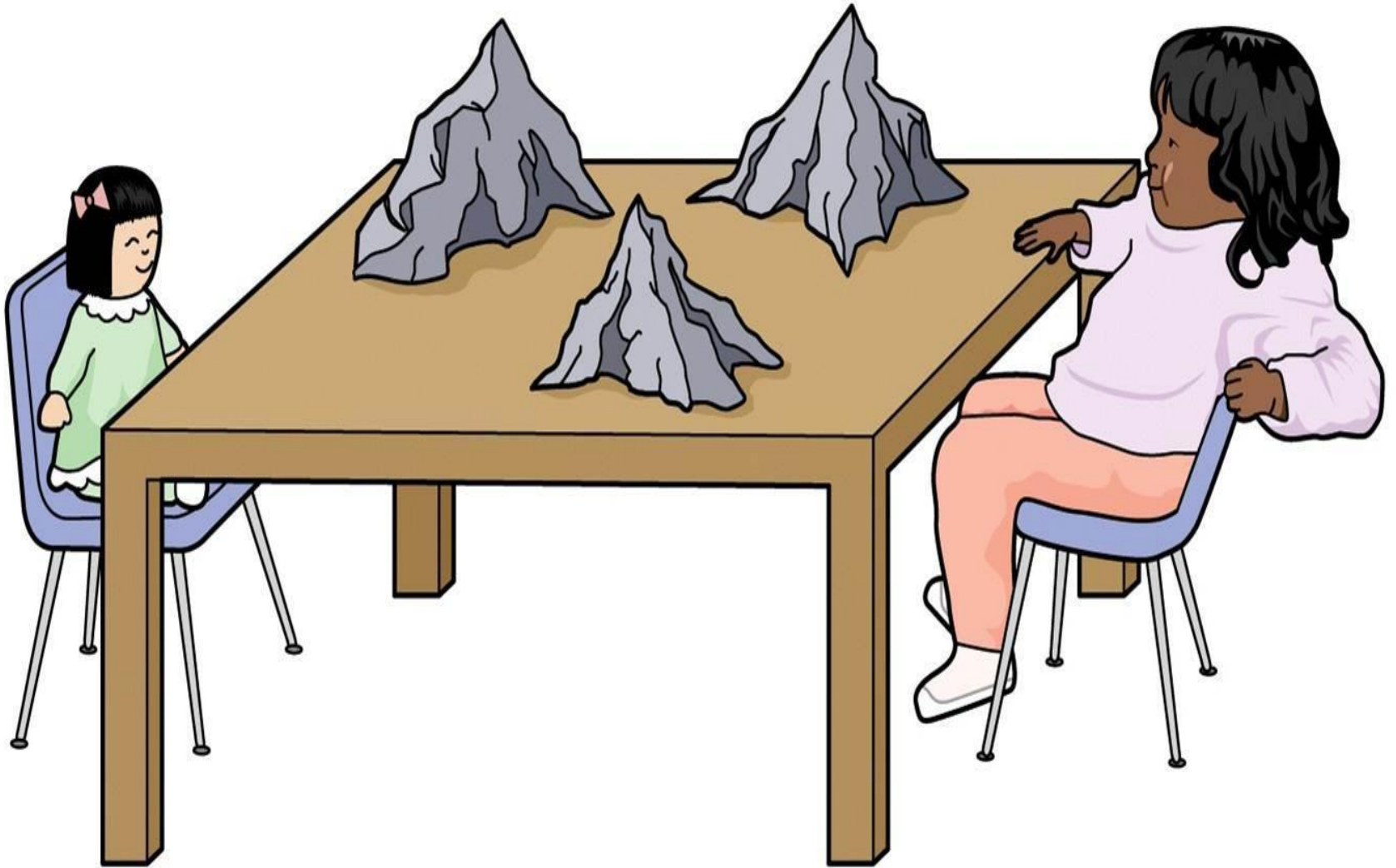
Preoperational Stage (2–7 years)

- Lack the concept of **conservation** – which holds that two equal quantities remain equal even if the appearance of one is changed, as long as nothing is added or subtracted
- **Irreversibility** – child cannot mentally reverse a sequence of events or logical operations back to the starting point
- **Animism**–the belief that everything has a consciousness

THE SYMBOLIC FUNCTION

- *Symbolic function: the ability to use symbols, or mental representations - words, numbers or images to which a person has attached meaning.*
- A child no longer needs a sensory cue to think about something
- The symbolic function enables children to reflect upon people, objects, & events that are not physically present. It is shown in deferred imitation, pretend play, & language
 - *Deferred imitation* appears to begin in infancy, it is the repetition of an observed action after time has passed
 - *Symbolic play* children make an object symbolize for something else
 - *Language* involves the use of a common system of symbols through words to communicate

Egocentrism



Conservation

- It is an understanding that certain properties remain constant despite changes in their form.
- These properties can include mass, volume, and numbers.

Conservation

- Number



In conservation of number tests, two equivalent rows of coins are placed side by side and the child says that there is the same number in each row. Then one row is spread apart and the child is again asked if there is the same number in each.

Conservation

- Length



In conservation of length tests, two same-length sticks are placed side by side and the child says that they are the same length. Then, one is moved and the child is again asked if they are the same length.

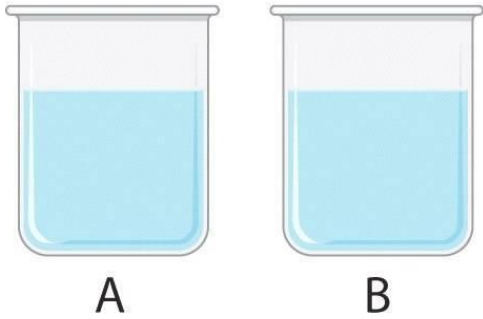
Conservation

- Substance

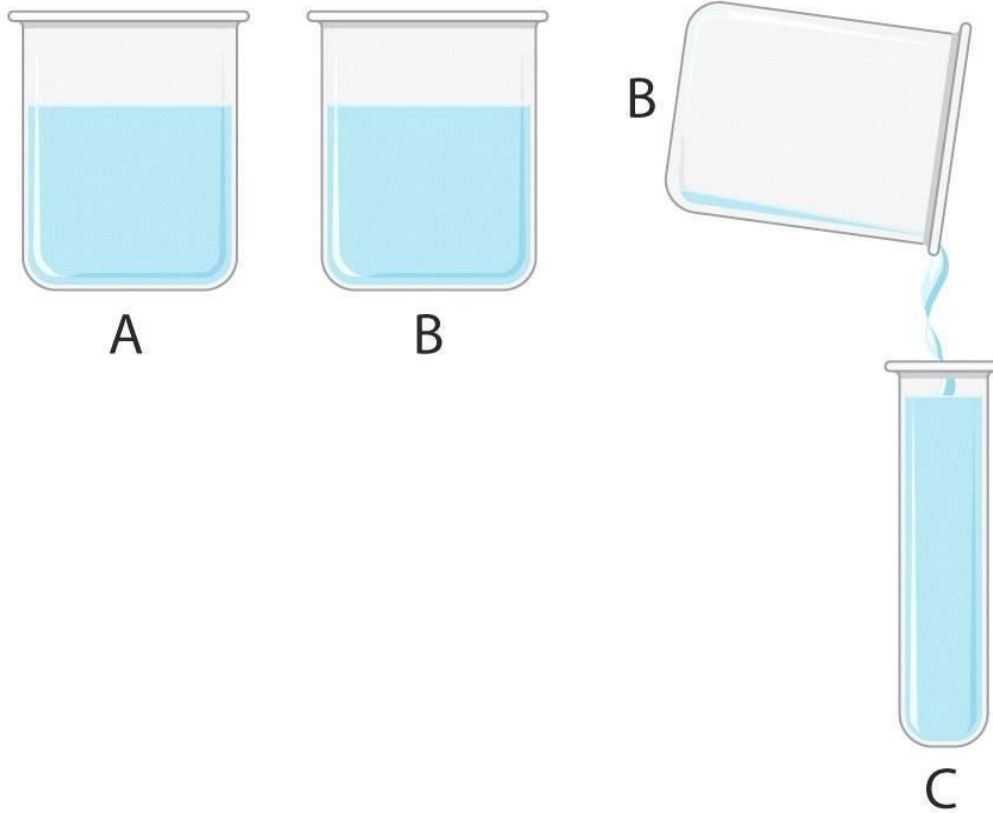


In conservation of substance tests, two identical amounts of clay are rolled into similar-appearing balls and the child says that they both have the same amount of clay. Then one ball is rolled out and the child is again asked if they have the same amount.

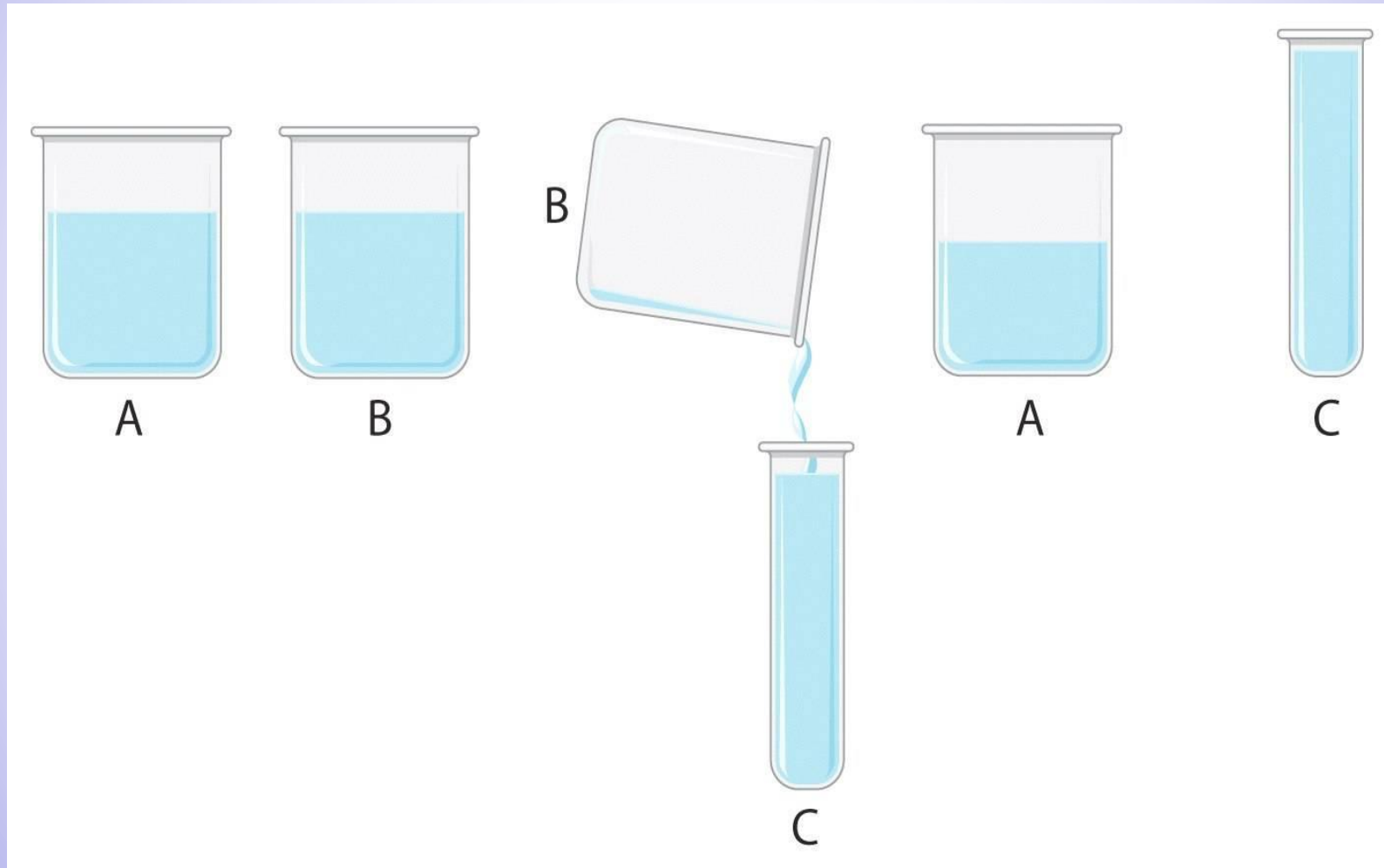
Conservation of volume



Conservation of volume










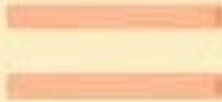




Conservation of volume



Types of Conservation Tasks

Tests of Various Types of Conservation

Type of conservation	Initial presentation	Transformation	Question	Preoperational child's answer
Liquid	Two equal glasses of liquid. 	Pour one into a taller, narrower glass. 	Which glass contains more?	The taller one. 
Number	Two equal lines of checkers. 	Increase spacing of checkers in one line. 	Which line has more checkers?	The longer one. 
Matter	Two equal balls of clay. 	Squeeze one ball into a long, thin shape. 	Which piece has more clay?	The long one. 
Length	Two sticks of equal length. 	Move one stick. 	Which stick is longer?	The one that is farther to the right. 

Concrete Operational Stage (7–12 years)

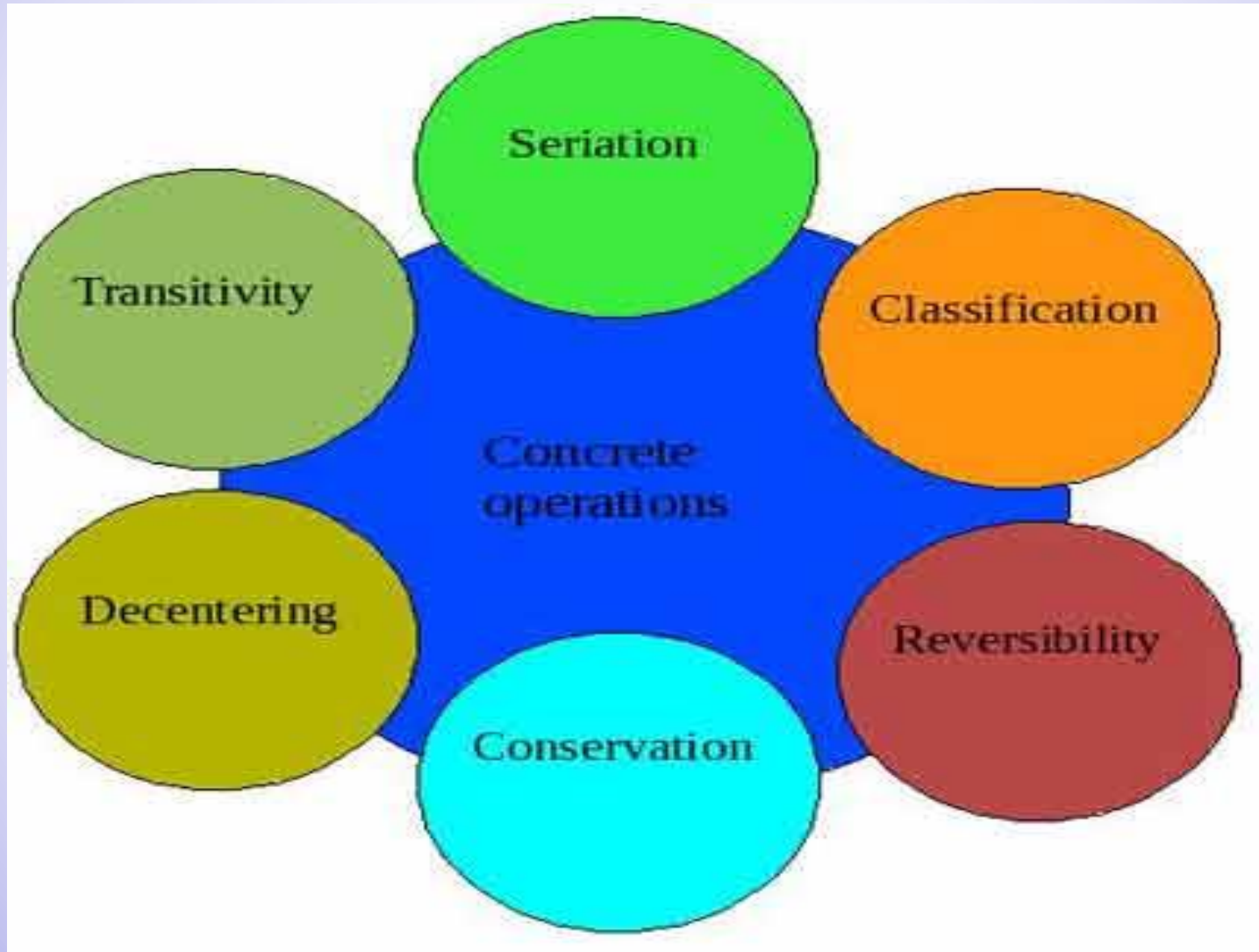


Concrete Operational Stage



- Children gain a fuller understanding of conservation and other mental operations that allow them to think logically, but only about concrete events
 - **Conservation** for liquids, numbers, and matter acquired early, but conservation of length acquired later in the stage
 - Develops **transitivity** (e.g., if $A > B$, and $B > C$, then $A > C$)
 - Develops **seriation**, the ability to order stimuli along a quantitative dimension (e.g., a set of pencils by their length)
- The reasoning of concrete operational children is tied to immediate reality (i.e., what is in front of them and tangible) and not with the hypothetical world of possibility

Concrete Operational Stage (7–12 years)



Formal Operational Stage (age 12 – adulthood)

- Ability to think logically about abstract principles and hypothetical situations
- Hypothetical–deductive reasoning (What if.... problems)
- Adolescent egocentrism illustrated by the phenomenon of personal fable and imaginary audience

Assessing Piaget's Theory

- Scientific research has supported Piaget's most fundamental idea that infants, young children, and older children use distinct cognitive abilities to construct their understanding of the world BUT...
- Piaget underestimated the child's ability at various ages.
- Piaget confused motor skill limitations with cognitive limitations in assessing object permanence during infancy.
- Piaget's theory doesn't take into account culture and social differences.

Criticisms of Piaget's Theory

- There have been a number of criticisms levelled at Piaget's theory:

Implications for Education

There are four main teaching implications drawn from Piaget's theory (Slavin, 2005):

- A focus on the process of children's thinking, not just its products.
- Recognition of the crucial role of children's self-initiated, active involvement in learning activities.
- A de-emphasis on practices aimed at making children adult-like in their thinking.
- Acceptance of individual differences in developmental progress

- Teachers, within the classroom, should :
- Focus on the process of learning, rather than the end product of it.
- Adopt active methods that require rediscovering or reconstructing "truths".
- Use collaborative, as well as individual activities (so children can learn from each other).
- Devise situations that present useful problems, and create disequilibrium in the child.
- Evaluate the level of the child's development, so suitable tasks can be set.