



## DEVELOPMENT OF MATHEMATICAL CONCEPTS

**At about what age can children develop specific mathematics concepts?  
This chart outlines what children are capable of understanding at 3, 4, and 5 years of age.**

NUMBER CONCEPT	AT 3 YEARS Children may:	AT 4 YEARS Children may:	AT 5 YEARS Children may:
<b>Verbal Counting.</b> Learning the standard sequences of number words	Count 1 to 10	Count one to 30, with emphasis on counting patterns; for instance knowing that “21, 22 ...” is parallel to “1, 2 ...”	Count one to 100, with emphasis on patterns (e.g., “60, 70” is parallel to “6, 7;” “14” to “19” parallel to “4” to “9”)
<b>Object Counting.</b> Creating a one-to-one correspondence between a number word and an item	Count one to four items, maintaining one-to-one correspondence Count one to 10 items, knowing that the last counting word tells	“how many”	Count one to 20 items
<b>“Seeing” Numbers.</b> Instantly “seeing how many” supports counting, comparing, and adding	See groups of one to three	See groups of one to five	See groups of one to six; regular patterns up to 10
<b>Comparing Numbers.</b> Comparing and ordering build on nonverbal knowledge and experience with collections	Identify whether collections are the “same” number or which is “more” visually	Use counting or matching to compare two collections one to five, despite appearances	Use counting to compare two collections one to 10, using words “equal,” “more,” “less,” and “fewer”
<b>Adding and Subtracting.</b> Solving problems using informal strategies in math learning	Use nonverbal adding and subtracting with very small numbers of objects	Solve and make word problems using concrete modeling with sums to five	Pose and solve word problems using counting-based strategies such as counting on, sums to 10

## GEOMETRY AND MEASUREMENT

<b>Shapes.</b> Geometric shapes can be used to represent and understand objects	Match shapes, first with same size and orientation, then with different sizes and orientation	Recognize and name some variations of the circle, square, triangle, rectangle	Recognize and name circle, square, triangle, rectangle, in any size or orientation
<b>Putting Together Shapes.</b> Shapes can be decomposed and composed into other shapes and structures	Use shapes in isolation to make a picture	Cover an outline with shapes without leaving gaps by trial-and-error	Cover an outline with shapes without leaving gaps by using foresight. Make a picture by combining shapes
<b>Locations, Directions, and Coordinates.</b> Mathematics can precisely specify directions, routes, and locations	Understand and use ideas such as over, under, above, on, beside, next to, between	Learn a simple route from a map placed in direct relation to the space	Place toy objects in correct relative position to make a map of the classroom
<b>Symmetry.</b> Symmetry can be used to understand and create shapes in geometry and art	Show awareness of symmetry in block buildings	Informally create 2-D shapes and 3-D buildings that have symmetry	Identify and create shapes that have line or rotational symmetry
<b>Measurement.</b> Measuring can be used to specify and compare “how much”	Develop language such as bigger, longer, and taller	Discuss and compare attributes informally, including comparing gross differences	Compare length using another object. Measure with multiple copies of a unit (such as block)
<b>Patterns.</b> Patterns weave through all other topics in mathematics	Notice simple repeating patterns, such as a wall of blocks with long, short, long, short ...	Copy simple repeating patterns	Notice and discuss patterns in arithmetic (such as adding one to any number results in the next “counting number”)