

Benchmarks for 3-year-old Preschool Mathematics

Number Sense & Operations

Listens to and says the names of numbers in meaningful ways

Connects quantities of objects or actions to numbers

Uses ordinal numbers (first, second, third)

Uses concrete objects to solve simple addition and subtraction problems

Observes and manipulates concrete examples of whole and half

Becomes familiar with U.S. coins

	1	2	3

Patterns & Relationships

Sorts, categorizes, or describes objects by one or more attributes

Recognizes, describes, reproduces, extends, creates and compares repeating patterns of concrete materials

Shapes and Spatial Sense

Identifies several shapes

Shows understanding of several positional words

Measurement

Uses estimation in meaningful ways

Uses nonstandard units to measure

Evaluation Descriptors

Skills are introduced and developed throughout the school year in alignment with the Massachusetts Frameworks. Gray boxes indicate the marking period when the student is expected to be Secure in the skill.

Beginning (B)

Student's work shows fragments of understanding and effort to accomplish the task. Student cannot explain the concepts or procedures involved.

Developing (D)

Student accomplishes part of the task independently and may need teacher support to complete it. Student can partially explain the concepts or procedures.

Secure (S)

Student's strategies meet the demands of the task and demonstrate a firm grasp of the concepts and procedures involved, at least 90% of the time. The student applies his/her knowledge and understanding in varying contexts.

Benchmarks for 4-year-old Preschool Mathematics

Number Sense & Operations

- Listens to and says the names of numbers in meaningful ways
- Connects quantities of objects or actions to numbers
- Uses ordinal numbers (first, second, third)
- Uses concrete objects to solve simple addition and subtraction problems
- Observes and manipulates concrete examples of whole and half
- Becomes familiar with U.S. coins

	1	2	3

Patterns & Relationships

- Sorts, categorizes, or describes objects by one or more attributes
- Recognizes, describes, reproduces, extends, creates and compares repeating patterns of concrete materials

Shapes and Spatial Sense

- Identifies several shapes
- Shows understanding of several positional words

Measurement

- Uses estimation in meaningful ways
- Uses nonstandard units to measure

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Benchmarks for Kindergarten Mathematics

Number Sense & Operations

- Counts by ones to 20
- Matches quantities up to 10 with numerals and words
- Identifies ordinal numbers up to fifth
- Uses appropriate language in comparing sets of up to ten objects (e.g., none, more than, same number of, fewer than)
- Understands the concept of whole and half
- Identifies U.S. coins by name
- Uses objects and drawings to model and solve related addition and subtraction problems to ten
- Estimates the number of objects in a group and verifying results

	1	2	3
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Identifies ordinal numbers up to fifth			
Uses appropriate language in comparing sets of up to ten objects (e.g., none, more than, same number of, fewer than)			
Understands the concept of whole and half			
Identifies U.S. coins by name			
Uses objects and drawings to model and solve related addition and subtraction problems to ten			
Estimates the number of objects in a group and verifying results			

Patterns & Relationships

- Sorts and describes objects by a variety of properties
- Describes, reproduces, extends, and creates patterns
- Counts by fives and tens up to fifty

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Describes, reproduces, extends, and creates patterns			
Counts by fives and tens up to fifty			

Geometry

- Names, describes, sorts, and draws simple two-dimensional shapes
- Describes attributes and parts of 2 dimensional shapes
- Names and compares three-dimensional shapes
- Identifies positions of objects in space

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Describes attributes and parts of 2 dimensional shapes			
Names and compares three-dimensional shapes			
Identifies positions of objects in space			

Measurement

- Recognizes and compare attributes of length, volume, weight, area and time using appropriate language
- Makes and uses estimates of measurements from everyday experiences
- Uses nonstandard units to measure length, area, weight, and capacity

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Data Analysis, Statistics, & Probability

- Collects, sorts, organizes and draws conclusions about data using concrete objects, pictures, numbers, and graphs

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Benchmarks for 2nd Grade Mathematics

Number Sense & Operations

Reads, writes, and compares numbers to 1000
 Counts independently forward/backward by (1,2,5,10) with 2 and 3 digit numbers
 Identifies and counts coins up to \$1 and bills to \$20
 Reads and writes money values using dollar and cents notation
 Shades and names the fractional parts of $\frac{1}{4}$, $\frac{1}{3}$, and $\frac{1}{2}$
 Correctly states +/- facts to 18 and fact families
 Uses strategies to add and subtract 1,2,3 digit numbers
 Solves addition and subtraction number stories
 Uses math vocabulary appropriately

	1	2	3

Patterns & Relationships

Uses patterns and rules to solve problems
 Describes, extends, and creates patterns

Geometry

Describes the similarities and differences among plane figures
 Identifies, describes, and compares 2- and 3- dimensional shapes
 Includes all lines of symmetry in 2-dimensional shapes
 Predicts and confirms results of putting together and taking apart shapes

Measurement

Measures and compares common objects using metric and English units of length measurement
 Tells and records times to the quarter hour using digital and analog clocks with a.m. and p.m.
 Identifies and understand parts of the day, week, and year
 Selects and correctly uses appropriate measurement tools

Data Analysis, Statistics, & Probability

Collects, records, and interprets data in an organized way
 Draws conclusions and makes educated guesses about the situation based on data collected

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Benchmarks for 3rd Grade Mathematics

	1	2	3
<u>Number Sense & Operations</u>			
Read, model, write, compare and order numbers to 9,999			
Identify, represent, locate on a number line, and compare fractions as parts of unit wholes and as parts of groups			
Add and subtract fractions with like denominators			
Recognize and identify odd and even numbers			
Relate multiplication problems to division problems			
Know and use multiplication and related division facts			
Use appropriate operations to solve problems			
Add and subtract up to four-digit numbers with trading			
Multiply up to two-digit numbers by a one-digit number			
Use rounding to judge the reasonableness of an answer			
<u>Patterns & Relationships</u>			
Create, extend and explain patterns			
Solve equations with variables			
Write equations to represent mathematical relationships			
<u>Geometry</u>			
Describes, compare, and classify two-dimensional shapes			
Identify and describe simple three-dimensional shapes			
Identify and draw right angles, parallel, perpendicular, and intersecting lines			
Identify and draw lines of symmetry			
Locate and identify points on a grid using ordered pairs of numbers and/or letters			
<u>Measurement</u>			
Identify and use appropriate metric and U.S. Customary units and tools			
Identify time to the minute using a.m. and p.m., convert hours to minutes, and compute elapsed time			
Solve problems involving length, area, perimeter, weight, temperature, and time			
<u>Data Analysis, Statistics, & Probability</u>			
Construct and draw conclusions from tables, line plots, pictographs, tallies, and bar graphs			
Find the number of possible combinations of objects from two sets			

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Benchmarks for 4th Grade Mathematics

Number Sense & Operations

- Read, model, write, and compare numbers to 100,000
- Identify, represent, locate on a number line, and compare fractions as parts of unit wholes and as parts of groups
- Add and subtract fractions with like denominators
- Relate multiplication problems to division problems
- Know and use multiplication and division facts
- Use appropriate operations to solve problems
- Add and subtract up to five-digit numbers with trading
- Multiply up to three-digit numbers by a two-digit number
- Divide up to three-digit numbers by a one-digit divisor
- Use rounding to judge the reasonableness of an answer

	1	2	3

Patterns & Relationships

- Create, extend and explain patterns
- Find values of variables in equations
- Write equations to represent mathematical relationships

Geometry

- Draw, compare, and classify two-dimensional shapes
- Draw, compare, and classify three-dimensional shapes
- Identify and draw right, acute, and obtuse angles, parallel, perpendicular, and intersecting lines
- Identify and draw lines of symmetry
- Recognize similar and congruent figures
- Locate and identify points and paths on a grid using ordered pairs of numbers and/or letters

Measurement

- Identify and use appropriate metric and U.S. Customary units and tools
- Solve problems involving length, area, perimeter, angle size, weight, volume, temperature, and time

Data Analysis, Statistics, & Probability

- Construct and draw conclusions from tables, line plots, pictographs, tallies, and bar graphs
- Find the number of possible combinations of objects from three sets
- Determine the probability of possible outcomes

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Benchmarks for 5th Grade Mathematics

Number Sense & Operations

Demonstrates understanding of prime and composite numbers, prime factorization, and divisibility rules
 Understands place value to billions and hundredths
 Finds and positions integers, fractions, mixed numbers, and decimals on the number line
 Understands exponents, esp. when used in powers of ten
 Knows multiplication facts
 Models the addition and subtraction of integers on a number line
 Applies the Order of Operations
 Adds, subtracts, and multiplies whole numbers
 Adds and subtracts fractions with like denominators and mixed numbers

	1	2	3
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Understands exponents, esp. when used in powers of ten			
Knows multiplication facts			
Models the addition and subtraction of integers on a number line			
Applies the Order of Operations			
Adds, subtracts, and multiplies whole numbers			
Adds and subtracts fractions with like denominators and mixed numbers			

Patterns & Relationships

Analyzes and determines the rules for extending number patterns
 Replaces variables with given values and evaluates
 Identifies and describes relationships between two variables with a constant rate of change

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Replaces variables with given values and evaluates			
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Geometry

Identifies properties of polygons
 Identifies three dimensional shapes based on their properties, such as edges and faces
 Graphs points and identifies coordinates of points on a one-quadrant Cartesian coordinate plane

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Identifies three dimensional shapes based on their properties, such as edges and faces			
Graphs points and identifies coordinates of points on a one-quadrant Cartesian coordinate plane			

Measurement

Finds areas of triangles and parallelograms
 Identifies and measures circles and the relationship of the radius, diameter, circumference, and area
 Identifies, measures, describes, and classifies various angles, triangles, and quadrilaterals

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Data Analysis, Statistics, & Probability

Identifies the median, mean, mode, maximum, and minimum of a set of data
 Constructs stem-and-leaf plots, line plots, and circle graphs
 Predicts the probability of outcomes for an experiment

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