

Mathematics

Kindergarten

In Kindergarten, instructional time should focus on two critical areas: (1) representing and comparing whole numbers, initially with sets of objects; (2) describing shapes and space.

Counting and Cardinality

Competency: *Students will reason abstractly and quantitatively, recognizing and making appropriate use of mathematical symbols and expressions for different purposes.*

Competency: *Students will demonstrate an understanding of the nature of numbers, thinking flexibly and attending to precision and reasonableness when solving problems using whole numbers.*

- Know number names and the count sequence.
- Count to tell the number of objects.
- Compare numbers.

K.CC.A.1	Count to 100 by ones and by tens.
K.CC.A.2	Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
K.CC.A.3	Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).
K.CC.B.4	Understand the relationship between numbers and quantities; connect counting to cardinality. <u>K.CC.B.4.A</u> When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. <u>K.CC.B.4.B</u> Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. <u>K.CC.B.4.C</u> Understand that each successive number name refers to a quantity that is one larger.
K.CC.B.5	Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.
K.CC.C.6	Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.

K.CC.C.7	Compare two numbers between 1 and 10 presented as written numerals.
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Operations and Algebraic Thinking

Competency: *Students will reason abstractly and quantitatively, recognizing and making appropriate use of mathematical symbols and expressions for different purposes.*

Competency: *Students will demonstrate an understanding of the nature of numbers, thinking flexibly and attending to precision and reasonableness when solving problems using whole numbers.*

Competency: *Students will apply additive reasoning using multiple strategies (algorithms, models, manipulatives) to solve authentic applied problems.*

- *Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.*

K.OA.A.1	Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
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K.OA.A.2	Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
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K.OA.A.3	Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5 = 2 + 3$ and $5 = 4 + 1$).
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K.OA.A.4	For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
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K.OA.A.5	Fluently add and subtract within 5.
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Number and Operations in Base Ten

Competency: *Students will use reasoning and self-monitoring to analyze and explain a solution pathway.*

- *Work with numbers 11-19 to gain foundations for place value.*

K.NBT.A.1	Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.
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Measurement and Data

Competency: *Students will use standard and nonstandard measurement tools, units, and attributes to describe and compare objects, authentic applied situations, or events, and to solve measurement problems.*

Competency: *Students will gather, represent, and interpret data related to a particular/single unit scale, including authentic applications.*

- *Describe and compare measurable attributes.*
- *Classify objects and count the number of objects in each category*

K.MD.A.1	Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.	
K.MD.A.2	Directly compare two objects with a measurable attribute in common, to see which object has "more of" / "less of" the attribute, and describe the difference.	<i>For example, directly compare the heights of two children and describe one child as taller/shorter.</i>
K.MD.B.3	Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.	

Geometry

Competency: *Students will recognize and use attributes of two- and three dimensional figures to solve problems.*

- *Identify and describe shapes.*
- *Analyze, compare, create, and compose shapes.*

K.G.A.1	Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as <i>above, below, beside, in front of, behind,</i> and <i>next to</i> .	
K.G.A.2	Correctly name shapes regardless of their orientations or overall size.	
K.G.A.3	Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").	
K.G.B.4	Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).	
K.G.B.5	Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.	
K.G.B.6	Compose simple shapes to form larger shapes.	<i>For example, "Can you join these two triangles with full sides touching to make a rectangle?"</i>

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Standards/ Competencies/ "I Can" Statements

KCC5, KCC6, KOA1,	Students will reason abstractly and quantitatively, recognizing and making appropriate use of mathematical symbols and expressions for different purposes.	I can represent whole number quantities in multiple ways (words, symbols, expressions, equations, etc.). <ul style="list-style-type: none"> • I can interpret and explain conceptual meanings of mathematical relationships and symbols used for them, such as expressing quantities, equivalence, and greater than-less than. • I can represent and interpret addition and subtraction in multiple formats, including expressions and equations.
KCC4, KOA3,	Students will demonstrate an understanding of the nature of numbers, thinking flexibly and attending to precision and reasonableness when solving problems using whole numbers.	<ul style="list-style-type: none"> • I can count, compare, order, estimate, and represent quantities using my understanding of place value to explain my answer or strategy. • I can model and explain why decomposition of whole numbers will help me understand a number or answer a question or solve a problem.
KOA5, KOA2, KOA4	Students will apply additive reasoning using multiple strategies (algorithms, models, manipulatives) to solve authentic applied problems.	I can fluently add, subtract and estimate using whole numbers. <ul style="list-style-type: none"> • I can perform operations with whole numbers using models, representations, and math language. • I can apply properties and inverse relationships between addition and subtraction to solve and justify solutions. • I can determine and explain my reasoning for an appropriate approach for a given situation.

KMD1, KMD2	Students will use standard and nonstandard measurement tools, units, and attributes to describe and compare objects, authentic applied situations, or events, and to solve measurement problems.	I can apply appropriate tools and techniques while attending to precision to solve problems involving measurement (time, money, length, height, weight). <ul style="list-style-type: none"> • I can estimate and explain measurements using appropriate units. • I can describe and compare relative sizes of objects using terms such as: short-long, short-tall, heavy-light, more-less, large-small, thick-thin.
KG1 KG6	Students will recognize and use attributes of two- and three dimensional figures to solve problems.	<ul style="list-style-type: none"> • I can describe, compare, and explain possible classifications of objects and figures based on geometric attributes. • I can compose, decompose, and draw figures applying spatial reasoning.
KMD3	Students will gather, represent, and interpret data related to a particular/single unit scale, including authentic applications	<ul style="list-style-type: none"> • I can formulate questions and gather, record, and organize data to answer them. • I can construct and interpret data (e.g., using pictograph, bar graph, tally) to answer questions or identify patterns
KNTB1	Students will use reasoning and self-monitoring to analyze and explain a solution pathway.	<ul style="list-style-type: none"> • I can check the reasonableness of solutions (e.g., with estimation, diagrams, tables). • I can critique and explain the strategy and mathematical reasoning used in a problem.