



North Carolina Essential Standards Mathematics Grade 4

Note on Numbering: **N**–Number and Operations, **A**–Algebra, **G**–Geometry, **M**–Measurement, **S**–Statistics and Probability and **D**–Discrete Mathematics

Number and Operations

	Essential Standard	Clarifying Objectives	
4.N.1	Understand the value of whole numbers and decimal representations from 0.01 to 100,000.	4.N.1.1	Represent whole numbers and decimals using models, words and numbers (symbolic).
		4.N.1.2	Compare sets of two to six numbers, arranging them from least to greatest or greatest to least.
		4.N.1.3	Illustrate the place value structure of decimals and whole numbers when multiplying and dividing by 10.
4.N.2	Use strategies to solve problems involving multi-digit addition, subtraction, multiplication and division of whole numbers.	4.N.2.1	Use strategies to develop fluency in solving problems using up to four-digit addition and subtraction (larger number with calculator).
		4.N.2.2	Use strategies to develop fluency for multiplication with two-digit by one-digit and two-digit by two-digit numbers.
		4.N.2.3	Use strategies with three-digit by one-digit division with and without remainders to develop fluency.
		4.N.2.4	Use estimation of whole number operations in meaningful contexts to justify the reasonableness of the solution.
		4.N.2.5	Use area models to understand multiplication and related concepts such as factors, multiples (including squares), prime and composite numbers.
4.N.3	Understand the concept of equivalence with models as it applies to fractions, improper fractions, mixed numbers and decimals.	4.N.3.1	Identify equivalent fractions (using halves, fourths, eights; thirds, sixths, twelfths and fifths, tenths, hundredths)
		4.N.3.2	Compare fractions, decimals and mixed numbers using models, benchmarks (e.g. 0, $\frac{1}{2}$, 0.5, 1, $\frac{n}{n}$, $1\frac{1}{2}$, 1.5, 2, $\frac{2n}{n}$...) and reasoning.
		4.N.3.3	Represent mixed numbers as improper fractions and improper fractions as mixed numbers.
		4.N.3.4	Understand the equivalence of fractions as related to the size of the whole.
		4.N.3.5	Represent pairs of equivalent ratios by composing and decomposing to include the smallest equivalent whole number ratio (ratio unit).
4.N.4	Use models to represent addition and subtraction of fractions and decimals.	4.N.4.1	Illustrate addition and subtraction of fractions, with like denominators, using area and length models.
		4.N.4.2	Illustrate addition and subtraction of decimals using area and length models.
		4.N.4.3	Use estimation to justify the reasonableness of solutions.

Algebra

	Essential Standard	Clarifying Objectives	
4.A.1	Use mathematical properties to examine numerical relationships and solve mathematical problems.	4.A.1.1	Use mathematical properties (associative, commutative, distributive and identity) to make conjectures about observed relationships and to solve problems.
4.A.2	Use models to write equations and inequalities with variables.	4.A.2.1	Use models to write multi-step equations.
		4.A.2.2	Use models to write one-step inequalities with variables.
		4.A.2.3	Use order of operations.
4.A.3	Analyze patterns to identify rules.	4.A.3.1	Use rules to describe numeric growing patterns (arithmetic sequences) and describe numeric growing patterns using rules.
		4.A.3.2	Use rules to describe non-numeric growing patterns and illustrate non-numeric growing patterns using rules.
		4.A.3.3	Use rules to find missing values in numeric and non-numeric patterns.

Geometry

	Essential Standard	Clarifying Objectives	
4.G.1	Understand the concept of symmetry and transformations.	4.G.1.1	Understand the concept of symmetry (line, rotational, both, neither).
		4.G.1.2	Understand the concepts of transformations including reflections, translations and rotations.
		4.G.1.3	Use symmetry to understand relationships to transformations as they apply to two-dimensional shapes.

Measurement

	Essential Standard	Clarifying Objectives	
4.M.1	Use customary units to measure length, weight*, capacity and temperature to solve problems. *More properly mass, but most commonly understood as weight at this grade band.	4.M.1.1	Use the customary unit and appropriate tool to measure selected attributes.
		4.M.1.2	Apply the processes of measurement (partitioning, transitivity, iteration and compensatory principle) to capacity and length.
		4.M.1.3	Use estimation to interpret the reasonableness of length (inch, foot, yard and mile), weight (ounce and pound), capacity (ounces, cups, pints, quarts and gallons) and temperature (°F) measurements.
4.M.2	Understand the relationship between area and perimeter of polygons.	4.M.2.1	Understand the concept and how to determine the perimeter of composite rectangular figures.
		4.M.2.2	Understand the relationship between area and perimeter of composite rectangular figures.
		4.M.2.3	Use area models to illustrate multiplication of a unit fraction times a whole number.

Statistics and Probability

	Essential Standard	Clarifying Objectives	
4.S.1	Interpret data from investigations involving one or two sets of data.	4.S.1.1	Interpret the data presented in circle graphs, relating the parts to the whole.
		4.S.1.2	Represent collected data in line graphs.
		4.S.1.3	Interpret one or two sets of data in terms of shape (cluster, gap, trend and unusual data points), center (typicality, mode or median) and range (variability) of the data set.
		4.S.1.4	Understand the differences between individual-to-individual (ungrouped) comparisons and individual to group (grouped) comparisons.
4.S.2	Predict the outcomes of simple probability experiments.	4.S.2.1	Represent the possible outcomes (sample space) of simple probability experiments.
		4.S.2.2	Represent probability and relative likelihood of events using fractions.