

Grade 4 Grade-Level Expanded Expectations

NUMBER SENSE AND OPERATIONS IN BASE TEN: NBT

4.NBT.A	Use place value understanding and properties of operations to perform multi-digit arithmetic with numbers up to one million.	
4.NBT.A.1	Round multi-digit whole numbers to any place.	The expectation of the student is to use place value understanding to round multi-digit whole numbers to any place in the context of estimation.
4.NBT.A.2	Read, write and identify multi-digit whole numbers up to one million using number names, base ten numerals and expanded form.	The expectation of the student is to read, write and identify multi-digit whole numbers up to one million using base ten numerals, number names and expanded notation.
4.NBT.A.3	Compare two multi-digit numbers using the symbols $>$, $=$ or $<$, and justify the solution.	The expectation of the student is to compare two multi-digit numbers based on meanings of the digits in each place using $>$, $=$ or $<$ to record the results of the comparison (this may be verbal).
4.NBT.A.4	Understand that in a multi-digit whole number, a digit represents 10 times what it would represent in the place to its right.	The expectation of the student is to understand that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.
4.NBT.A.5	Demonstrate fluency with addition and subtraction of whole numbers.	The expectation of the student is to demonstrate fluency with addition and subtraction of whole numbers. (<i>Fluency refers to accuracy and efficiency and does not equate to memorization.</i>)
4.NBT.A.6	Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, and justify the solution.	The expectation of the student is to multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, area models and/or other methods.

4.NBT.A.7	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, and justify the solution.	The expectation of the student is to find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, area models and/or other methods.
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NUMBER SENSE AND OPERATIONS IN FRACTIONS: NF

4.NF.A	Extend understanding of fraction equivalence and ordering. (Limit denominators to 2, 3, 4, 5, 6, 8, 10, 12 and 100.)	
4.NF.A.1	Explain and/or illustrate why two fractions are equivalent.	The expectation of the student is to explain and/or illustrate why two fractions are equivalent.
4.NF.A.2	Recognize and generate equivalent fractions.	The expectation of the student is to recognize and generate equivalent fractions.
4.NF.A.3	Compare two fractions using the symbols $>$, $=$ or $<$, and justify the solution.	The expectation of the student is to compare two fractions with different numerators and different denominators. (<i>e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$</i>) Record the results of comparisons with symbols $>$, $=$, $<$, and justify the conclusions. (<i>e.g., by using a visual fraction model</i>)
4.NF.B	Extend understanding of operations on whole numbers to fraction operations.	
4.NF.B.4	Understand addition and subtraction of fractions as joining/composing and separating/decomposing parts referring to the same whole.	The expectation of the student is to understand addition and subtraction of fractions as joining/composing and separating/decomposing parts referring to the same whole.
4.NF.B.5	Decompose a fraction into a sum of fractions with the same denominator and record each decomposition with an equation and justification.	The expectation of the student is to decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition with an equation. (<i>e.g., $\frac{3}{8} = \frac{1}{8} + \frac{2}{8}$; $2\frac{1}{8} = 1 + 1 + \frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{1}{8} = \frac{17}{8}$</i>) Justify decompositions. (<i>e.g., by using number lines, manipulative or drawings</i>)

4.NF.B.6	Solve problems involving adding and subtracting fractions and mixed numbers with like denominators.	The expectation of the student is to solve problems involving adding and subtracting fractions and mixed numbers with like denominators. (<i>Sums and differences may be expressed in equivalent forms and simplified forms are not required.</i>) (e.g., $\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$; $2 \frac{1}{8} + \frac{3}{8} = 2 \frac{4}{8}$; $3 \frac{1}{3} + 2 \frac{2}{3} = 5 \frac{3}{3}$)
4.NF.B.7	Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.	The expectation of the student is to apply and extend previous understandings of multiplication to multiply a fraction by a whole number. (e.g., $10 \times \frac{2}{5}$ means 10 groups of $\frac{2}{5}$ or 20 fifths; alternatively $\frac{2}{5} \times 10$ means $\frac{2}{5}$ of a group of 10)
4.NF.B.8	Solve problems involving multiplication of a fraction by a whole number.	The expectation of the student is to solve word problems involving multiplication of a fraction by a whole number.
4.NF.C	Understand decimal notation for fractions, and compare decimal fractions. (Denominators of 10 or 100)	
4.NF.C.9	Use decimal notation for fractions with denominators of 10 or 100.	The expectation of the student is to use decimal notation for fractions with denominators of 10 or 100.
4.NF.C.10	Understand that fractions and decimals are equivalent representations of the same quantity.	The expectation of the student is to understand that fractions (with denominators of 10 or 100) and decimals are equivalent representations of the same quantity.
4.NF.C.11	Read, write and identify decimals to the hundredths place using number names, base ten numerals and expanded form.	The expectation of the student is to read, write and write decimals to the hundredths place in word, standard and expanded form.
4.NF.C.12	Compare two decimals to the hundredths place using the symbols $>$, $=$ or $<$, and justify the solution.	The expectation of the student is to compare two decimals to the hundredths place by reasoning about their size. Record the results of comparisons with symbols $>$, $=$ or $<$, and justify the conclusions. (e.g., by using number lines, manipulatives or drawings)

RELATIONSHIPS AND ALGEBRAIC THINKING: RA

4.RA.A	Use the four operations with whole numbers to solve problems.	
4.RA.A.1	Multiply or divide to solve problems involving a multiplicative comparison.	The expectation of the student is to multiply or divide to solve word problems involving multiplicative comparison. (e.g., <i>Brad ran 5 laps. Gerry ran three times as many laps as Brad. How many laps did Gerry run? Janet ate 12 cookies. This was four times as many as Lori ate. How many did Lori eat?</i>)

4.RA.A.2	Solve multi-step whole number problems involving the four operations and variables and using estimation to interpret the reasonableness of the answer.	The expectation of the student is to solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Use estimation to assess reasonableness of answers.
4.RA.A.3	Solve whole number division problems involving variables in which remainders need to be interpreted, and justify the solution.	The expectation of the student is to solve whole number division word problems in which remainders need to be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Use estimation to assess reasonableness of answers.
4.RA.B	Work with factors and multiples.	
4.RA.B.4	Recognize that a whole number is a multiple of each of its factors and find the multiples for a given whole number.	The expectation of the student is to recognize that a whole number is a multiple of each of its factors and find the multiples for a given whole number.
4.RA.B.5	Determine if a whole number within 100 is composite or prime, and find all factor pairs for whole numbers within 100.	The expectation of the student is to find all factor pairs for whole numbers up to 100. Determine whether a given whole number in the range 1 – 100 is composite or prime.
4.RA.C	Generate and analyze patterns.	
4.RA.C.6	Generate a number pattern that follows a given rule.	The expectation of the student is to generate a number pattern that follows a given rule.
4.RA.C.7	Use words or mathematical symbols to express a rule for a given pattern.	The expectation of the student is to use words or mathematical symbols to express the rule for a given pattern. (<i>e.g., “starting at zero add three to each term; starting at three add two each time”</i>)

GEOMETRY AND MEASUREMENT: GM

4.GM.A	Classify 2-dimensional shapes by properties of their lines and angles.	
4.GM.A.1	Draw and identify points, lines, line segments, rays, angles, perpendicular lines and parallel lines.	The expectation of the student is to draw points, lines, line segments, rays, angles (right, acute or obtuse) and perpendicular and parallel lines. Identify these in two-dimensional figures.
4.GM.A.2	Classify two-dimensional shapes by their sides and/or angles.	The expectation of the student is to classify two-dimensional shapes by their sides and/or angles (<i>e.g., acute equilateral triangle; if a quadrilateral has two pairs of parallel sides it would be classified as a parallelogram</i>)

4.GM.A.3	Construct lines of symmetry for a two-dimensional figure.	The expectation of the student is to identify and construct lines of symmetry for a two-dimensional figure.
4.GM.B	Understand the concepts of angle and measure angles.	
4.GM.B.4	Identify and estimate angles and their measure.	The expectation of the student is to identify and estimate angles and their measure. Understand angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand angles are measured with reference to the degrees of a circle.
4.GM.B.5	Draw and measure angles in whole-number degrees using a protractor.	The expectation of the student is to draw and measure angles in whole-number degrees using a protractor.
4.GM.C	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	
4.GM.C.6	Know relative sizes of measurement units within one system of units. a) Convert measurements in a larger unit in terms of a smaller unit.	The expectation of the student is to know relative sizes of measurement units within one system of units limited to in., ft., yd., km, m, cm; kg, g, lb., oz.; l, ml, pt., qt., gal; hr., min, sec. Within a single system of measurement, express measurements of a larger unit in terms of a smaller unit given the equivalent unit conversion (e.g., know that 1 ft. is 12 times as long as 1 in., express the length of a 4 ft. snake as 48 in.)
4.GM.C.7	Use the four operations to solve problems involving distances, intervals of time, liquid volume, weight of objects and money.	The expectation of the student is to use the four operations to solve word problems involving distances, intervals of time, liquid volume, weight of objects and money, including problems involving simple fractions or decimals.
4.GM.C.8	Apply the area and perimeter formulas for rectangles to solve problems.	The expectation of the student is to apply the area and perimeter formulas for rectangles in real world and mathematical problems. (For this grade level, area problems involve whole-number side lengths and division problems involve single digit divisors.) (e.g., find the width of a rectangular room given the area of the flooring and the length)
DATA AND STATISTICS: DS		
4.DS.A	Represent and analyze data.	
4.DS.A.1	Create a frequency table and/or line plot to display measurement data.	The expectation of the student is to create a frequency table and/or line plot with the scale marked in whole numbers and/or fractions of a unit ($\frac{1}{2}, \frac{1}{4}, \frac{1}{8}$) to display a data set of measurements.

4.DS.A.2	Solve problems involving addition and subtraction by using information presented in a data display.	The expectation of the student is to solve problems involving addition and subtraction by using information presented in a data display (<i>e.g., line plot, bar graph, picture graph, frequency table</i>)
4.DS.A.3	Analyze the data in a frequency table, line plot, bar graph or picture graph.	The expectation of the student is to analyze the data in a frequency table, line plot, bar graph or picture graph to include determining the mode and range. (<i>At this grade level, fraction operations use only like denominators.</i>)