Grade 4 Math Curriculum Benchmarks

Operations and Algebraic Reasoning

Term	Uses the four operations with whole numbers to solve problems 4.OA.1, OA.2, OA.3
1	Interpret multiplication as a comparison. Ex. 35=5x7 35 is 5 times as many as 7 and 7 times as many as 5. Interpret verbal multiplicative comparisons as multiplication equations. Ex. “5 times as many as 7” 5X7=35. Solve one- or two-step word problems involving addition and subtraction.
2	Interpret multiplication as a comparison. Ex. 35=5x7 35 is 5 times as many as 7 and 7 times as many as 5. Interpret verbal multiplicative comparisons as multiplication equations. Ex. “5 times as many as 7” 5X7=35. Multiply to solve word problems involving multiplicative comparison. Ex: Uses drawings and an equation with a symbol for the unknown number to represent the problem. Distinguish between additive comparison and multiplicative comparisons. Solve one- or two-step word problems involving addition, subtraction, and multiplication, including problems in which remainders must be interpreted. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
3	Interpret multiplication as a comparison. Ex. 35=5x7 35 is 5 times as many as 7 and 7 times as many as 5. Interpret verbal multiplicative comparisons as multiplication equations. Ex. “5 times as many as 7” 5X7=35. Multiply or divide to solve word problems involving multiplicative comparison. Ex: Uses drawings and an equation with a symbol for the unknown number to represent the problem. Distinguish between additive comparison and multiplicative comparisons.

	Solve one- or two-step word problems involving addition, subtraction, multiplication, and division, including problems in which remainders must be interpreted. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Term	**Identifies and generates factors and multiples.** **4.OA.4**
1	Find factor pairs for a whole number in the range 1-40. Recognize that a whole number is a multiple of each of its factors. Determine whether a given number in the range 1-40 is a multiple of a given 1-digit number. Determine whether a given whole number in the range 1-40 is prime or composite.
2	Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given number in the range 1-100 is a multiple of a given 1-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.
3	Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given number in the range 1-100 is a multiple of a given 1-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.

Term	**Generates/analyzes number and shape patterns.** **4.OA.5**

1	Generate a number or shape pattern that follows a given rule.
2	Generate a number or shape pattern that follows a given rule.
3	Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. Ex: Complete the pattern “add 3” and observe that the terms alternate between even and odd numbers. Students should be able to informally explain why the numbers will continue to alternate this way.

Number and Operations in Base Ten

Term	Demonstrates an understanding of place value of multi-digit whole numbers 4.NBT.1, NBT.2, NBT.3
1	Recognize the relationships between place values that are up to 100 times as large as another place. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on place value using <, =, >. Round multi-digit numbers to the greatest place value up to the hundred thousands.
2	Recognize that in a multi-digit whole number, a digit in one place value represents ten times what it represents in the place to its right. Students should be able to divide by a multiple of 10 (70, 700, 7,000) when the answer is a whole number. Ex: 7,000/70=100 by applying concepts of place value and division. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on place value using <, =, >. Round multi-digit numbers to a given place value. Ex. Round 8,534 to the nearest hundred 8,500.
3	Recognize that in a multi-digit whole number, a digit in one place value represents ten times what it represents in the place to its right. Students should be able to divide by a multiple of 10 (70, 700, 7,000) when the answer is a whole number. Ex: 7,000/70=100 by applying concepts of place value and division. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two

	multi-digit numbers based on place value using <, =, >. Round multi-digit numbers to a given place value. Ex. Round 8,534 to the nearest hundred 8,500.

Term	**Knows multiplication facts & related division facts through 12x12. 4.NBT.5A A rating of 4 is unavailable for this standard.**
1	Knows from memory multiplication facts through 12x12 and applies in daily work. Ex. Completes 50 multiplication facts with 90% accuracy in 5 minutes and applies to daily work.
2	Knows from memory multiplication and related division facts through 12x12. Ex. Completes 50 multiplication facts with 90% accuracy in 5 minutes and applies to daily work.
3	Knows from memory multiplication and related division facts through 12x12. Ex. Completes 50 multiplication facts with 90% accuracy in 5 minutes and applies to daily work. Note: Accelerated placement includes a fluency test of 50 multiplication/division facts to be completed with 90% accuracy in 2.5 minutes.

Term	**Fluently add and subtract multi-digit whole numbers 4.NBT.4**
1	Fluently add and subtract multi-digit whole numbers using the standard algorithm.
2	Fluently add and subtract multi-digit whole numbers using the standard algorithm.
3	Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Term	**Multiply up to 4-digit by 1-digit numbers and 2-digit by 2-digit numbers. 4.NBT.5**
1	NA

2	Multiply 2-digit by 1-digit numbers.
3	Multiply up to 4-digit by 1-digit numbers and 2-digit by 2-digit numbers. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Term	**Understands and explains whole-number quotients and remainders. NBT.6**
1	NA
2	NA
3	Find whole-number quotients and remainders with up to 4-digit dividends and 1-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, and/or area models. NOTE: This standard closely ties with OA.3, which includes word problems that interpret remainders.

Number and Operations-Fractions

Term	**Demonstrates an understanding of fraction equivalence and ordering. 4.NF.1, NF.2**
1	NA
2	Recognize two equivalent fractions through 12ths using a model. Explain why they are equivalent. Identify that the number and size of parts differ in equivalent fractions through 12ths. Recognize that fraction comparisons require same-size wholes using a model. Compare two fractions using a model and explain.
3	Find and explain equivalent fractions by using visual fraction models with attention to how the numbers and sizes of the parts differ. Compare two fractions with different numerators and different denominators (where one denominator is a factor of the

	other) by creating common denominators or numerators or by comparing to a benchmark fraction such as ½. Ex: Compare 2/3 to 2/9. Students compare to ½ and know that 2/3 is greater than ½ and 2/9 is less than ½. Or, students change 2/3 to 6/9 and know that 6/9 is greater. Compare two fractions with different numerators and different denominators by creating common denominators or numerators or by comparing to a benchmark fraction such as ½. Ex: Compare 2/3 to 3/8. Students compare to ½ and know that 2/3 is greater than ½ and 3/8 is less than ½. Or, students change 2/3 and 3/8 to16/24 and 9/24. Compare fractions with symbols >, =, < and justify the conclusions e.g. using a visual fraction model.

Term	**Demonstrates an understanding of decimal notation for fractions- denominators of 10 & 100. NF.6**
1	NA
2	Represent decimals to hundredths using a model. Translate between decimal notation and fractions with denominators of 10 and 100 with a model. Students attempt translating without a model.
3	Use decimal notation for fractions with denominators of 10 or 100. Ex: rewrite 0.62 as 62/100

Term	**Compares decimals. 4.NF.7**
1	NA
2	Compare two decimals to hundredths, using a model, by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole.
3	Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole.

Term	**Adds/subtracts fractions and mixed numbers with like denominators. 4.NF.3**

1	NA
2	Add and subtract fractions, including mixed numbers, with no regrouping, using manipulatives, and explain using a model. Decompose a fraction into a sum of unit fractions. Ex: 2/5= ⅕+⅕, and explain using a model.
3	Decompose a fraction into a sum of unit fractions. Ex: 2/5= 1/5+1/5, and explain using a model. Add and subtract mixed numbers with the same denominator, and explain using a model. Solve word problems involving addition and subtraction of fractions by using visual fraction models and equations to represent them.

Term	**Multiplies a fraction by a whole number. 4.NF.4**
1	NA
2	NA
3	Understand a fraction a/b as a multiple of 1/b. Ex: Use a visual model to represent 5/4 as a product of 5 X (1/4) Understand a multiple of a/b as a multiple of 1/b and use this understanding to multiply a fraction by a whole number. Ex: Use a visual fraction model to express 3 X (2/5) as 6 X (1/5). Solve word problems involving multiplication of a fraction by a whole number by using visual fraction models and equations to represent them.

Measurement and Data

Term	Solves problems involving measurement and conversion of measurements within one system. 4.MD.1, MD.2
1	Convert time and customary units of length in a two-column table and explain the relationship. Solve number stories involving customary units of length and units of time.
2	Convert time, units of length, capacity, and mass in a two-column table and explain the relationship. Solve number stories involving customary units of length, time, money, and metric units of length, capacity, and mass including stories involving simple fractions or decimals.
3	Find the linear measurement of objects including problems involving simple fractions. Ex: measure a line that is 2½ cm long. Know relative size of measurement units within one system of units, including km, m, cm, kg, g, lb, oz, l, ml, hr, min, and sec. Within one measurement system express measurements in larger unit in terms of a smaller unit. Ex: 4 ft snake= 48 inches. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects and money, including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using number line diagrams that feature a measurement scale.

Term	Demonstrates an understanding of angles and measures angles. 4.MD.5, 4.MD.6, 4.MD.7
1	NA
2	Understand concepts of angle measurement and identify benchmark rotations such as ¼, ½, ¾ and full turns.
3	Understand concepts of angle measurement.

	Measure angles using whole number degrees using a protractor. Recognize angle measurements as additive. Solve addition and subtraction problems to find unknown angles on a diagram in real-world and mathematical problems.

Term	Applies the area and perimeter formulas for rectangles to real-life examples. 4.MD.3
1	Find area and perimeter using a strategy.
2	Apply the area and perimeter formulas for rectangles in real-world and mathematical problems. Ex: Find the width of a rectangular room given the area of the flooring and the length by viewing the area formula as a multiplication equation with an unknown factor.
3	Apply the area and perimeter formulas for rectangles in real-world and mathematical problems. Ex: Find the width of a rectangular room given the area of the flooring and the length by viewing the area formula as a multiplication equation with an unknown factor.

Term	Represent and interpret data on a line plot MD.4
1	NA
2	Organize and represent data in ½ and ¼ units on line plots. Solve problems involving addition and subtraction by using line plot data in ½ and ¼ units. Ex: from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.
3	Make a line plot to display a data set of measurements in fractions of a unit (½ , ¼, ⅛). Solve problems involving addition and subtraction of fractions by using information presented in line plots. Ex: from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.

Geometry

Term	Analyzes, compares, and classifies two-dimensional shapes 4.G.1, 4.G.2
1	Draw and label points, lines, line segments, and rays and correctly identify right angles with support. Identify properties of line segments and angles within quadrilaterals and identify right triangles.
2	Draw points, lines, line segments, rays, angles (right acute, obtuse), and perpendicular and parallel lines. Identify these in 2-dimensional shapes. Classify 2-dimensional shapes based on presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category and identify right triangles.
3	Draw points, lines, line segments, rays, angles (right acute, obtuse), and perpendicular and parallel lines. Identify these in 2-dimensional shapes. Classify 2-dimensional shapes based on presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category and identify right triangles.

Term	Recognizes and draws lines of symmetry 4.G.3
1	Identify at least one line of symmetry in 2-dimensional symmetric figures.
2	Identify at least one line of symmetry in 2-dimensional symmetric figures.
3	Recognize line of symmetry for 2-dimensional shapes. Identify line-symmetric figures and draw lines of symmetry.

MATHEMATICAL PRACTICE

Listed below are examples of the use of mathematical practice. Practice and evidence are embedded in the lessons. Like the content standards, Mathematical Practices are scored by term. If a student is meeting the expectations of each lesson's mathematical practice, he/she is meeting the term expectations or benchmarks.

Term	Makes Sense of Problems and Perseveres in Solving Them

	SMP.1, SMP.2, SMP.7, SMP.8
	*Students explain the meaning of a problem to themselves and can discuss how they solved it. They ask themselves, "Does this make sense?" and "Can I solve this problem a different way?" They often use another method to check their answer.
	*Students recognize that a number represents a specific quantity and can write simple expressions and create logical representations of problem situations.
	*Students recognize pattern and structure. Ex: Students use properties of operations to explain calculations (partial products model).
1, 2, 3	*Students notice repetitive actions in computation to make generalizations. They also use models to explain patterns and generate their own algorithms. Ex: Students use visual fraction models to write equivalent fractions.

Term	Models and Explains Using Tools SMP.3, SMP.4, SMPS.5, SMP.6
	*Students ask and can explain questions such as: "How did you get that? And "Why is that true?" They explain their thinking and make connection between models and equations.
	*Students should evaluate their results in the context of the situation and reflect on whether the results make sense. They experiment with representing problem situations in multiple ways including numbers, words (using mathematical language), drawing pictures, using objects, making a chart, list, or graph, creating equations, etc. They should be able to use all of these representations as needed.
	*Students consider available tools (including estimation) when solving mathematical problems and decide when certain tools might be helpful. Ex: A student uses graph paper or a number line to represent and compare decimals or uses a protractor to measure an angle.
1, 2, 3	*Students use clear and precise language (oral and written), organize their work, and are accurate. Ex: Students use appropriate labels when creating a line plot.