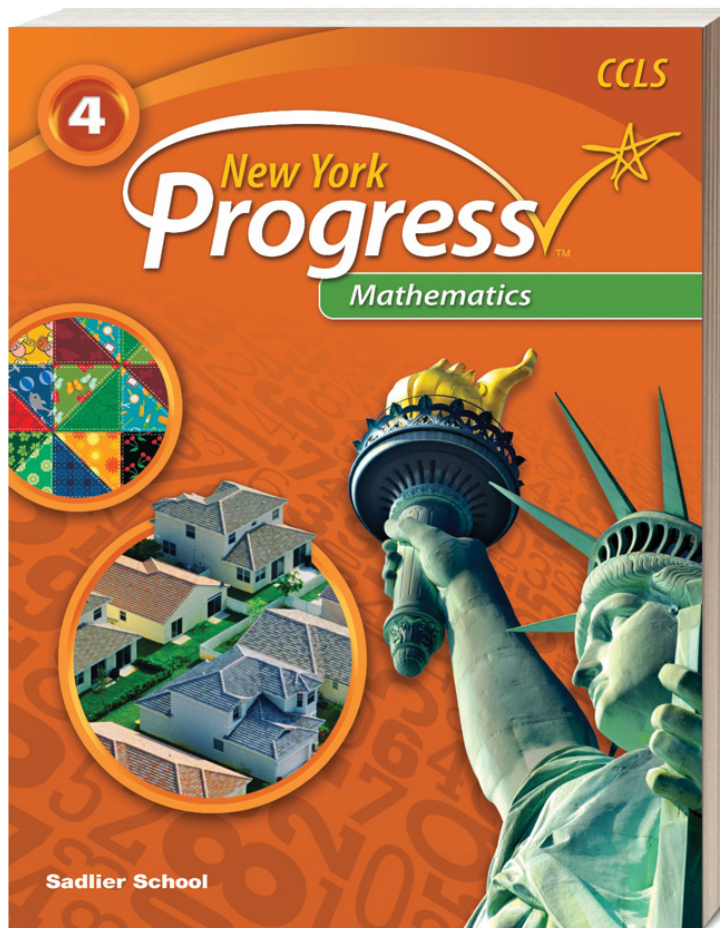# *Progress Mathematics*

Correlation to the New York State Next Generation Mathematics Learning Standards (2017) UPDATED JUNE 2019

Grade 4

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NY-4.OA — OPERATIONS AND ALGEBRAIC THINKING

Grade 4 Content Standards	*New York Progress Mathematics*, Grade 4
Use the four operations with whole numbers to solve problems.	
NY-4.OA.1 Interpret a multiplication equation as a comparison. Represent verbal statements of multiplicative comparisons as multiplication equations. e.g., • Interpret 35 = 5 x 7 as a statement that 35 is 5 times as many as 7 or 7 times as many as 5. • Represent "Four times as many as eight is thirty-two" as an equation, 4 x 8 = 32.	**Lesson 1** Interpret Multiplication Equations as Comparisons—pp. 10–17
NY-4.OA.2 Multiply or divide to solve word problems involving multiplicative comparison, distinguishing multiplicative comparison from additive comparison. Use drawings and equations with a symbol for the unknown number to represent the problem.	**Lesson 2** Problem Solving: Use Multiplication and Division to Make Comparisons—pp. 18–25
NY-4.OA.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted.	**Lesson 3** Problem Solving: Multistep Problems—pp. 26–33
NY-4.OA.3a Represent these problems using equations or expressions with a letter standing for the unknown quantity.	**Lesson 3** Problem Solving: Multistep Problems—pp. 26–33
NY-4.OA.3b Assess the reasonableness of answers using mental computation and estimation strategies including rounding. Note: Multistep problems need not be represented by a single expression or equation.	**Lesson 3** Problem Solving: Multistep Problems—pp. 26–33

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NY-4.OA   OPERATIONS AND ALGEBRAIC THINKING

Grade 4 Content Standards	*New York Progress Mathematics*, Grade 4

Gain familiarity with factors and multiples.

NY-4.OA.4 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 whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.	**Lesson 4** Find Factors and Multiples for Whole Numbers— pp. 34–41

Generate and analyze patterns.

NY-4.OA.5 Generate a number or shape pattern that follows a given rule. Identify and informally explain apparent features of the pattern that were not explicit in the rule itself. e.g., Given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.	**Lesson 5** Generate and Analyze Number and Shape Patterns—pp. 42–49

NY-4.NBT   NUMBER AND OPERATIONS IN BASE TEN

Grade 4 Content Standards	*New York Progress Mathematics*, Grade 4

Generalize place value understanding for multi-digit whole numbers.

NY-4.NBT.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. e.g., Recognize that $70 \times 10 = 700$ (and, therefore, $700 \div 10 = 70$) by applying concepts of place value, multiplication, and division. Note: Grade 4 expectations are limited to whole numbers less than or equal to 1,000,000.	**Lesson 6** Understand Place Value of Whole Numbers—pp. 56–63

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NY-4.NBT — NUMBER AND OPERATIONS IN BASE TEN

Grade 4 Content Standards	*New York Progress Mathematics*, Grade 4
NY-4.NBT.2	
NY-4.NBT.2a Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. e.g., 50,327 = 50,000 + 300 + 20 + 7	**Lesson 7** Read, Write, and Compare Whole Numbers—pp. 64–71
NY-4.NBT.2b Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. Note: Grade 4 expectations are limited to whole numbers less than or equal to 1,000,000.	**Lesson 7** Read, Write, and Compare Whole Numbers—pp. 64–71
NY-4.NBT.3 Use place value understanding to round multi-digit whole numbers to any place. Note: Grade 4 expectations are limited to whole numbers less than or equal to 1,000,000.	**Lesson 8** Apply Place Value to Round Whole Numbers—pp. 72–79

Use place value understanding and properties of operations to perform multi-digit arithmetic.

NY-4.NBT.4 Fluently add and subtract multi-digit whole numbers using a standard algorithm. Note: Grade 4 expectations are limited to whole numbers less than or equal to 1,000,000.	**Lesson 9** Add and Subtract Fluently with Whole Numbers—pp. 80–87
NY-4.NBT.5 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, and/or area models. Note on and/or: Students should be taught to use equations, rectangular arrays, and area models; however, when illustrating and explaining any calculation, students can choose any strategy. Note: Grade 4 expectations are limited to whole numbers less than or equal to 1,000,000.	**Lesson 10** Multiply Whole Numbers: Use Place Value—pp. 88–95

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NY-4.NBT — NUMBER AND OPERATIONS IN BASE TEN

Grade 4 Content Standards	*New York Progress Mathematics*, Grade 4
NY-4.NBT.6 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, and/or area models. Notes on and/or: Students should be taught to use strategies based on place value, the properties of operations, and the relationship between multiplication and division; however, when solving any problem, students can choose any strategy. Students should be taught to use equations, rectangular arrays, and area models; however, when illustrating and explaining any calculation, students can choose any strategy. Note: Grade 4 expectations are limited to whole numbers less than or equal to 1,000,000.	**Lesson 11** Multiply Whole Numbers: Use Properties of Operations—pp. 96–103 **Lesson 12** Divide Whole Numbers: Use Place Value—pp. 104–111 **Lesson 13** Divide Whole Numbers: Use Properties of Operations—pp. 112–119

NY-4.NF — NUMBER AND OPERATIONS—FRACTIONS

Grade 4 Content Standards	*New York Progress Mathematics*, Grade 4
Extend understanding of fraction equivalence and ordering.	
NY-4.NF.1 Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{(a \times n)}{(b \times n)}$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.	**Lesson 14** Understand Equivalent Fractions—pp. 126–133 **Lesson 15** Write Equivalent Fractions—pp. 134–141

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NY-4.NF   NUMBER AND OPERATIONS—FRACTIONS

Grade 4 Content Standards	*New York Progress Mathematics*, Grade 4
NY-4.NF.2 Compare two fractions with different numerators and different denominators. e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Note: Without specifying the whole, the shaded area could represent the fraction $\frac{3}{2}$ (if one square is the whole) or $\frac{3}{4}$ (if the entire rectangle is the whole). e.g., using a visual fraction model. Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.	**Lesson 16** Compare Two Fractions—pp. 142–149

Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

NY-4.NF.3 Understand a fraction $\frac{a}{b}$ with $a > 1$ as a sum of fractions $\frac{1}{b}$. Note: $\frac{1}{b}$ refers to the unit fraction for $\frac{a}{b}$.	
NY-4.NF.3a Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.	**Lesson 18** Understand Fractions on the Number Line—pp. 158–165
NY-4.NF.3b Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions. e.g., Justify decompositions by using a visual fraction model such as, but not limited to: • $\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$ • $\frac{3}{8} = \frac{1}{8} + \frac{2}{8}$ • $2\frac{1}{8} = 1 + 1 + \frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{1}{8}$	**Lesson 18** Understand Fractions on the Number Line—pp. 158–165

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NY-4.NF   NUMBER AND OPERATIONS—FRACTIONS

Grade 4 Content Standards	*New York Progress Mathematics*, Grade 4
NY-4.NF.3c Add and subtract mixed numbers with like denominators. e.g., replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.	**Lesson 19** Add and Subtract Mixed Numbers with Like Denominators—pp. 166–173
NY-4.NF.3d Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators. e.g., using visual fraction models and equations to represent the problem. Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.	**Lesson 20** Problem Solving: Add and Subtract Fractions—pp. 174–181
NY-4.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number or a fraction. Note: This standard refers to n groups of a fraction (where n is a whole number), e.g., 4 groups of $\frac{1}{3}$; which lends itself to being thought about as repeated addition. In grade 5 (NY-5. NF.4) students will be multiplying a fraction by a whole number, e.g., $\frac{1}{3}$ of 4.	
NY-4.NF.4a Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$. e.g., Use a visual fraction model to represent $\frac{5}{4}$ as the product $5 \times \frac{1}{4}$, recording the conclusion with the equation $\frac{5}{4} = 5 \times \frac{1}{4}$.	**Lesson 21** Multiply Unit Fractions by Whole Numbers—pp. 182–189

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NY-4.NF   NUMBER AND OPERATIONS—FRACTIONS

Grade 4 Content Standards	*New York Progress Mathematics*, Grade 4
NY-4.NF.4b Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a whole number by a fraction. e.g., Use a visual fraction model to express $3 \times \frac{2}{5}$ as $6 \times \frac{1}{5}$, recognizing this product as $\frac{6}{5}$, in general, $n \times \frac{a}{b} = \frac{(n \times a)}{b}$.	**Lesson 22** Multiply Fractions by Whole Numbers—pp. 190–197
NY-4.NF.4c Solve word problems involving multiplication of a whole number by a fraction. e.g., using visual fraction models and equations to represent the problem. e.g., If each person at a party will eat $\frac{3}{8}$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie? Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.	**Lesson 23** Problem Solving: Multiply Fractions by Whole Numbers—pp. 198–205

Understand decimal notation for fractions, and compare decimal fractions.

NY-4.NF.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. e.g., Express $\frac{3}{10}$ as $\frac{30}{100}$, and add $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$. Notes: • Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade. • Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.	**Lesson 24** Add Fractions: Denominators of 10 and 100—pp. 206–213

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NY-4.NF NUMBER AND OPERATIONS—FRACTIONS

Grade 4 Content Standards	*New York Progress Mathematics*, Grade 4
NY-4.NF.6 Use decimal notation for fractions with denominators 10 or 100. e.g., • Rewrite 0.62 as $\frac{62}{100}$ or $\frac{62}{100}$ as 0.62. • Describe a length as 0.62 meters. • Locate 0.62 on a number line. Note: Grade 4 expectations are limited	**Lesson 25** Write and Compare Decimal Fractions—pp. 214–221
NY-4.NF.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions. e.g., using a visual model. Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.	**Lesson 25** Write and Compare Decimal Fractions—pp. 214–221

NY-4.MD MEASUREMENT AND DATA

Grade 4 Content Standards	*New York Progress Mathematics*, Grade 4
Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	
NY-4.MD.1 Know relative sizes of measurement units: ft., in.; km, m, cm. e.g., • An inch is about the distance from the tip of your thumb to your first knuckle. • A foot is the length of two-dollar bills. • A meter is about the height of a kitchen counter. • A kilometer is $2\frac{1}{2}$ laps around most tracks. *continued*	**Lesson 26** Convert Customary Measurement Units—pp. 234–241 **Lesson 27** Convert Metric Measurement Units—pp. 242–249

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NY-4.MD	MEASUREMENT AND DATA
Grade 4 Content Standards	*New York Progress Mathematics*, Grade 4
Know the conversion factor and use it to convert measurements in a larger unit in terms of a smaller unit: ft., in.; km, m, cm; hr., min., sec. e.g., Know that 1 ft. is 12 times as long as 1 in. and express the length of a 4 ft. snake as 48 in. Given the conversion factor, convert all other measurements within a single system of measurement from a larger unit to a smaller unit. e.g., Given the conversion factors, convert kilograms to grams, pounds to ounces, or liters to milliliters. Record measurement equivalents in a two-column table. e.g., Generate a conversion table for feet and inches.	
NY-4.MD.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money.	
NY-4.MD.2a Solve problems involving fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit.	**Lesson 28** Problem Solving: Measurement—pp. 250–257
NY-4.MD.2b Represent measurement quantities using diagrams that feature a measurement scale, such as number lines. Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.	**Lesson 28** Problem Solving: Measurement—pp. 250–257
NY-4.MD.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. e.g., 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.	**Lesson 29** Problem Solving: Apply Area and Perimeter Formulas—pp. 258–265

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NY-4.MD	MEASUREMENT AND DATA
Grade 4 Content Standards	**New York Progress Mathematics**, Grade 4

Represent and interpret data.

NY-4.MD.4 Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots. e.g., Given measurement data on a line plot, find and interpret the difference in length between the longest and shortest specimens in an insect collection.	**Lesson 30** Problem Solving: Use Line Plots—pp. 266–273

Geometric measurement: understand concepts of angle and measure angles.

NY-4.MD.5 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.	
NY-4.MD.5a Recognize an angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $\frac{1}{360}$ of a circle is called a "one-degree angle," and can be used to measure angles.	**Lesson 31** Understand Angle Measures—pp. 274–281
NY-4.MD.5b Recognize an angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.	**Lesson 31** Understand Angle Measures—pp. 274–281

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NY-4.MD   MEASUREMENT AND DATA

Grade 4 Content Standards	*New York Progress Mathematics*, Grade 4
NY-4.MD.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	**Lesson 32** Use a Protractor to Measure Angles—pp. 282–289
NY-4.MD.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems. e.g., using an equation with a symbol for the unknown angle measure.	**Lesson 33** Problem Solving: Find Unknown Angle Measures—pp. 290–297

NY-4.G   GEOMETRY

Grade 4 Content Standards	*New York Progress Mathematics*, Grade 4
Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	
NY-4.G.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	**Lesson 34** Draw and Identify Points, Lines, and Angles—pp. 304–311
NY-4.G.2	
NY-4.G.2a Identify and name triangles based on angle size (right, obtuse, acute).	**Lesson 34** Draw and Identify Points, Lines, and Angles—pp. 304–311
NY-4.G.2b Identify and name all quadrilaterals with 2 pairs of parallel sides as parallelograms.	**Lesson 35** Classify Two-Dimensional Figures—pp. 312–319
NY-4.G.2c Identify and name all quadrilaterals with four right angles as rectangles.	**Lesson 35** Classify Two-Dimensional Figures—pp. 312–319

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NY-4.G — GEOMETRY

Grade 4 Content Standards	*New York Progress Mathematics*, Grade 4
NY-4.G.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	**Lesson 36** Identify Lines of Symmetry—pp. 320–327