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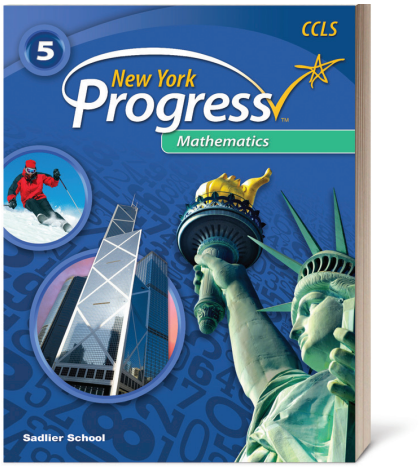
New York Progress Mathematics

Standards-Based Instruction & Practice



Aligned to the

New York State Learning Standards for Mathematics (Revised 2017)

Grade 5

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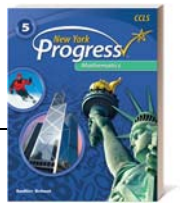
Grade 5



Operations & Algebraic Thinking

Grade 5 NYS Learning Standards for Mathematics	Sadlier New York Progress Mathematics, Grade 5
A. Write and interpret numerical expressions.	
5.OA.A.1 1. Apply the order of operations to evaluate numerical expressions. ADDITIONAL CLARIFICATION/EXAMPLES Note: Exponents and nested grouping symbols are not included.	**Lesson 1** **Use Grouping Symbols and Evaluate Numerical Expressions** (order of operations)—pp. 10–17
5.OA.A.2 2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. ADDITIONAL CLARIFICATION/EXAMPLES e.g., express the calculation "add 8 and 7, then multiply by 2" as (8 + 7) × 2. Recognize that 3 × (18,932 + 921) is three times as large as 18,932 + 921, without having to calculate the indicated sum or product.	**Lesson 2** **Interpret Quotients of Whole Numbers**—pp. 18–26
B. Analyze patterns and relationship.	
5.OA.B.3 3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. ADDITIONAL CLARIFICATION/EXAMPLES e.g., given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.	**Lesson 3** **Analyze Numerical Patterns**—pp. 26–33

Number & Operations in Base Ten

Grade 5 NYS Learning Standards for Mathematics	Sadlier New York Progress Mathematics, Grade 5
A. Understand the place value system.	
5.NBT.A.1 1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left.	**Lesson 4** **Understand Place Value**—pp. 40–47
5.NBT.A.2 2. Use whole-number exponents to denote powers of 10. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10.	**Lesson 5** **Powers of 10: Use Patterns and Whole-Number Exponents**—pp. 48–55

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Number & Operations in Base Ten

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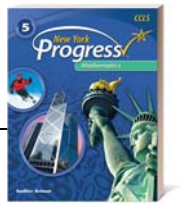
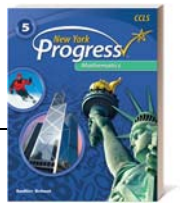
5.NBT.A.3 3. Read, write, and compare decimals to thousandths.	
5.NBT.A.3a 3a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. ADDITIONAL CLARIFICATION/EXAMPLES e.g., • $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times \frac{1}{10} + 9 \times \frac{1}{100} + 2 \times \frac{1}{1000}$ • $347.392 = (3 \times 100) + (4 \times 10) + (7 \times 1) + (3 \times \frac{1}{10}) + (9 \times \frac{1}{100}) + (2 \times \frac{1}{1000})$ • $347.392 = (3 \times 100) + (4 \times 10) + (7 \times 1) + (3 \times 0.1) + (9 \times 0.01) + (2 \times 0.001)$	**Lesson 6** **Read and Write Decimals to Thousandths**—pp. 56–63
5.NBT.A.3b 3b. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	**Lesson 7** **Compare Decimals to Thousandths**—pp. 64–71
5.NBT.A.4 4. Use place value understanding to round multi-digit whole numbers to any place.	**Lesson 8** **Round Decimals: Use Place Value**—pp. 72–79
B. Perform operations with multi-digit whole numbers and with decimals to hundredths.	
5.NBT.B.5 5. Fluently multiply multi-digit whole numbers using the standard algorithm.	**Lesson 9** **Multiply Fluently with Multi-Digit Numbers**—pp. 80–87
5.NBT.B.6 6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-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.	**Lesson 10** **Divide Whole Numbers: Use Place Value Strategies**—pp. 88–95 **Lesson 11** **Divide Whole Numbers: Use Properties of Operations**—pp. 96–103
5.NBT.B.7 7. Using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between operations: • add and subtract decimals to hundredths; • multiply and divide decimals to hundredths. Relate the strategy to a written method and explain the reasoning used. ADDITIONAL CLARIFICATION/EXAMPLES Note: Division problems are those that allow for the use of concrete models or drawings, strategies based on properties of operations, and/or the relationship between operations.	**Lesson 12** **Add and Subtract Decimals to Hundredths**—pp. 104–111 **Lesson 13** **Multiply Decimals to Hundredths**—pp. 112–119 **Lesson 14** **Divide Decimals to Hundredths**—pp. 120–127



Grade 5

Number & Operations—Fractions

Grade 5 NYS Learning Standards for Mathematics	Sadlier New York Progress Mathematics, Grade 5
A. Use equivalent fractions as a strategy to add and subtract fractions.	
5.NF.A.1 1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. ADDITIONAL CLARIFICATION/EXAMPLES e.g., • $\frac{1}{3}+\frac{2}{9}=\frac{3}{9}+\frac{2}{9}=\frac{5}{9}$ • $\frac{2}{3}+\frac{5}{4}=\frac{8}{12}+\frac{15}{12}=\frac{23}{12}$	**Lesson 15** **Add and Subtract Fractions with Unlike Denominators**—pp. 134–141
5.NF.A.2 2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. ADDITIONAL CLARIFICATION/EXAMPLES e.g., by using visual fraction models or equations to represent the problem. e.g., recognize an incorrect result $\frac{2}{5}+\frac{1}{2}=\frac{3}{7}$ by observing that $\frac{3}{7}<\frac{1}{2}$.	**Lesson 16** **Problem Solving: Add and Subtract Fractions**—pp. 142–149
B. Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	
5.NF.B.3 3. Interpret a fraction as division of the numerator by the denominator ($\frac{a}{b}$ = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers ADDITIONAL CLARIFICATION/EXAMPLES e.g., by using visual fraction models or equations to represent the problem. e.g., • Interpret $\frac{3}{4}$ as the result of dividing 3 by 4, noting that $\frac{3}{4}$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $\frac{3}{4}$. • If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?	**Lesson 17** **Interpret Fractions as Division**—pp. 150–157



Grade 5

Number & Operations—Fractions

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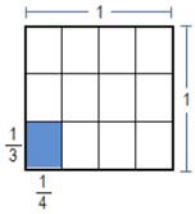
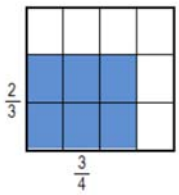
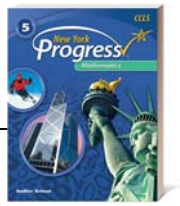
5.NF.B.4 4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.	
5.NF.B.4a 4a. Interpret the product $(\frac{a}{b}) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. ADDITIONAL CLARIFICATION/EXAMPLES e.g., use a visual fraction model to show $(\frac{2}{3}) \times 4 = \frac{8}{3}$, and create a story context for this equation. Do the same with $(\frac{2}{3}) \times (\frac{4}{5}) = (\frac{8}{15})$.	**Lesson 18** **Interpret Products of Fractions**—pp. 158–165
5.NBT.A.4b 4b. Find the area of a rectangle with fractional side lengths by tiling it with rectangles of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas. ADDITIONAL CLARIFICATION/EXAMPLES e.g., use the figure below shows $(\frac{2}{3}) \times (\frac{3}{4})$ by tiling it with rectangles of the appropriate unit fraction side lengths. The rectangle with the appropriate unit fraction side lengths.  The area of a (2/3) × (3/4) rectangle is 6/12 because the whole is partitioned into 12 parts with 6 of them shaded.  	**Lesson 19** **Find Areas of Rectangles: Tile and Multiply**—pp. 166–173
5.NF.B.5 5. Interpret multiplication as scaling (resizing).	
5.NF.B.5a 5a. Compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. ADDITIONAL CLARIFICATION/EXAMPLES e.g., in the case of $10 \times \frac{1}{2} = 5$, 5 is half of 10 and 5 is 10 times larger than $\frac{1}{2}$.	**Lesson 20** **Interpret Multiplication of Fractions as Scaling**—pp. 174–181
5.NBT.B.5b 5b. Explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole — *continued* —	**Lesson 20** **Interpret Multiplication of Fractions as Scaling**—pp. 174–181



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Number & Operations—Fractions

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numbers greater than 1 as a familiar case); explain whymultiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relate the principle of fraction equivalence $\frac{a}{b} = (\frac{a \times n}{b \times n})$ to the effect of multiplying $\frac{a}{b}$ by 1. ADDITIONAL CLARIFICATION/EXAMPLES e.g., • $\frac{3}{2} \times 4 > 4$ • $\frac{1}{2} \times 4 < 4$ • $\frac{2}{2} \times 4 = 4$	
5.NF.B.6 6. Solve real world problems involving multiplication of fractions and mixed numbers. ADDITIONAL CLARIFICATION/EXAMPLES e.g., using visual fraction models or equations to represent the problem.	**Lesson 21** **Problem Solving: Multiply Fractions and Mixed Numbers**—pp. 182–189
5.NF.B.7 7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. ADDITIONAL CLARIFICATION/EXAMPLES Note: Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement until grade 6 (6.NS.A.1).	
5.NF.B.7a 7a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. ADDITIONAL CLARIFICATION/EXAMPLES e.g., create a story context for $(\frac{1}{3}) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(\frac{1}{3}) \div 4 = \frac{1}{12}$ because $(\frac{1}{12}) \times 4 = \frac{1}{3}$.	**Lesson 22** **Divide Unit Fractions by Whole Numbers**—pp. 190–197
5.NBT.B.7b 7b. Interpret division of a whole number by a unit fraction, and compute such quotients. ADDITIONAL CLARIFICATION/EXAMPLES e.g., create a story context for $4 \div (\frac{1}{5})$ and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (\frac{1}{5}) = 20$ because $20 \times (\frac{1}{5}) = 4$.	**Lesson 23** **Divide Whole Numbers by Unit Fractions**—pp. 198–205
5.NF.B.7c 7c. Solve real-world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions.	**Lesson 24** **Problem Solving: Divide Unit Fractions and Whole Numbers**—pp. 206–213

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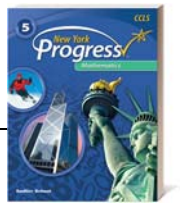

Number & Operations—Fractions

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ADDITIONAL CLARIFICATION/EXAMPLES e.g., by using visual fraction models and equations to represent the problem. e.g., how much chocolate will each person get if 3 people share $\frac{1}{2}$ lb. of chocolate equally? How many $\frac{1}{3}$-cup servings are in 2 cups of raisins?	

Measurement & Data

Grade 5 NYS Learning Standards for Mathematics	Sadlier New York Progress Mathematics, Grade 5
A. Convert like measurement units within a given measurement system.	
5.MD.A.1 1. Convert among different-sized standard measurement units within a given measurement system when the conversion factor is given. Use these conversions in solving multi-step, real world problems. ADDITIONAL CLARIFICATION/EXAMPLES e.g., convert 5 cm to 0.05 m.	**Lesson 25** **Convert Customary Measurement Units**—pp. 226–233 **Lesson 26** **Convert Metric Measurement Units**—pp. 234–241
B. Represent and interpret data.	
5.MD.B.2 2. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}, \frac{1}{4}, \frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots. ADDITIONAL CLARIFICATION/EXAMPLES e.g., given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.	**Lesson 27** **Problem Solving: Use Line Plots**—pp. 242–249
C. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	
5.MD.C.3 3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement.	
5.MD.C.3a 3a. Recognize that a cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.	**Lesson 28** **Understand Concepts of Volume Measurement**—pp. 250–257

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Measurement & Data

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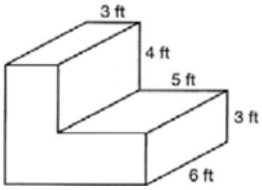
5.MD.C.3b 3b. Recognize that a solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units.	**Lesson 28**	**Understand Concepts of Volume Measurement**—pp. 250–257
5.MD.C.4 4. Measure volumes by counting unit cubes, using cubic cm, cubic in., cubic ft., and improvised units.	**Lesson 29**	**Measure Volume**—pp. 258–265
5.MD.C.5 5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.		
5.MD.C.5a 5a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base.	**Lesson 30**	**Find Volume: Relate Packing of Unit Cubes to Multiplying**—pp. 266–273
5.MD.C.5b 5b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.	**Lesson 31**	**Find Volume: Use the Associate Property**—pp. 274–281
	Lesson 32	**Problem Solving: Apply Volume Formulas for Prisms**—pp. 282–289
4.MD.C.5c 5c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems. ADDITIONAL CLARIFICATION/EXAMPLES e.g.,  	**Lesson 33**	**Problem Solving: Decompose Figures to Find Volume**—pp. 290–297

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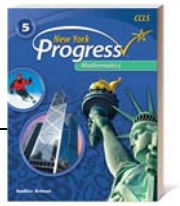

Geometry

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A. Graph points on the coordinate plane to solve real-world and mathematical problems.	
5.G.A.1 1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond. ADDITIONAL CLARIFICATION/EXAMPLES e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate.	**Lesson 34** **Understand Points on the Coordinate Plane**—pp. 304–311
5.G.A.2 2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	**Lesson 35** **Graph Points to Represent Problem Situations**—pp. 312–319
B. Classify two-dimensional figures into categories based on their properties.	
5.G.A.1 3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. ADDITIONAL CLARIFICATION/EXAMPLES e.g., all rectangles have four right angles and squares are rectangles, so all squares have four right angles.	**Lesson 36** **Analyze Properties to Classify Two-Dimensional Figures**—pp. 320–327
5.G.A.4 4. Classify two-dimensional figures in a hierarchy based on properties.	**Lesson 36** **Analyze Properties to Classify Two-Dimensional Figures**—pp. 320–327