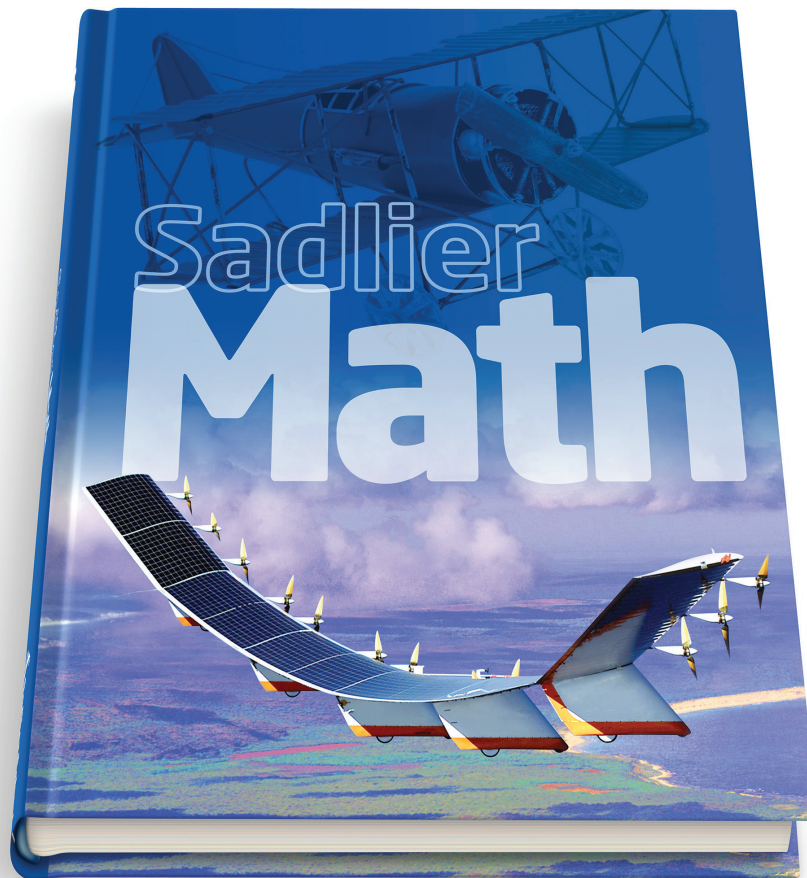# Sadlier Math™

Correlation to the Mathematics Standards for the Archdiocese of Detroit

Grade 5

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OPERATIONS AND ALGEBRAIC THINKING

Grade 5 Content Standards	*Sadlier Math*, Grade 5
Write and interpret numerical expressions.	
5.OA.A.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	**Chapter 2: 2-2** **Chapter 3: 3-1** **Chapter 4: 4-10 & 4-11**
5.OA.A.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*	**Chapter 1: 1-5 through 1-7** **Chapter 3: 3-2 & 3-3** **Chapter 4: 4-10 & 4-11**
Analyze patterns and relationships.	
5.OA.B.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. *For example, 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.*	**Chapter 17: 17-5 through 17-7**

NUMBER AND OPERATIONS IN BASE TEN

Grade 5 Content Standards	*Sadlier Math*, Grade 5
Understand the place value system.	
5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much *continued*	**Chapter 1: 1-1, 1-2 & 1-4**

NUMBER AND OPERATIONS IN BASE TEN

Grade 5 Content Standards	*Sadlier Math*, Grade 5
as it represents in the place to its right and 1/10 of what it represents in the place to its left.	
5.NBT.A.2 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. Use whole-number exponents to denote powers of 10.	**Chapter 1: 1-3 & 1-4** **Chapter 12: 12-1** **Chapter 13: 13-1**
5.NBT.A.3 Read, write, and compare all decimals.	
5.NBT.A.3a Read and write decimals using standard form, word form, and expanded form (using fractions, decimals, and exponents), e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).	**Chapter 2: 2-1 & 2-2**
5.NBT.A.3b Compare two decimals based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	**Chapter 2: 2-3**
5.NBT.A.4 Use place value understanding to round decimals to any place.	**Chapter 2: 2-4**

Perform operations with multi-digit whole numbers and with decimals to hundredths.

5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.	**Chapter 3: 3-4 through 3-8**
5.NBT.B.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.	**Chapter 4: 4-1 through 4-9**

NUMBER AND OPERATIONS IN BASE TEN

Grade 5 Content Standards	*Sadlier Math*, Grade 5
5.NBT.B.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	**Chapter 10: 10-1 through 10-7** **Chapter 11: 11-1 through 11-6** **Chapter 12: 12-2 through 12-9** **Chapter 13: 13-1, 13-2, 13-5 through 13-10**
5.NBT.B.8 Multiply a multi-digit number by a three-digit number; recognize and be able to explain common computational errors such as not accounting for place value.	**Chapter 3: 3-7**
5.NBT.B.9 Solve applied problems involving multiplication and division of whole numbers.	**Chapter 3: 3-1 through 3-2, 3-4 through 3-8** **Chapter 4: 4-1 through 4-9**
5.NBT.B.10 Divide fluently up to a four-digit number by a two-digit number.	**Chapter 4: 4-1 through 4-9**
5.NBT.B.11 Find the prime factorization of any composite numbers, express in exponential notation, and understand that every whole number greater than 1 is either prime or can be expressed as a product of primes.	**Chapter 5: 5-1**
5.NBT.B.12 Understand percentages as parts out of 100, use % notation, and express a part of a whole as a percentage.	**See Grade 6** **Chapter 11: 11-1**

Express, interpret and use ratios; find equivalences.

5.NBT.C.13 Convert fractions to decimals and decimals to fractions.	**See Grade 6** **Chapter 7: 7-2 through 7-4**
5.NBT.C.13a Convert fractions and decimals to percentages.	**See Grade 6** **Chapter 11: 11-4**
5.NBT.C.13b Convert percentages to fractions and decimals.	**See Grade 6** **Chapter 11: 11-2, 11-3 & 11-5**

NUMBER AND OPERATIONS IN BASE TEN

Grade 5 Content Standards	*Sadlier Math*, Grade 5
5.NBT.C.14 Express ratios in several ways given applied situation (3 cups to 5 people); recognize and find equivalent ratios.	**See Grade 6** **Chapter 10: 10-1**

NUMBERS AND OPERATIONS-FRACTIONS

Grade 5 Content Standards	*Sadlier Math*, Grade 5
Use equivalent fractions as a strategy to add and subtract fractions.	
5.NF.A.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. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd).*	**Chapter 6: 6-1 through 6-6** **Chapter 7: 7-1, 7-2, 7-4, 7-6 through 7-8**
5.NF.A.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*	**Chapter 6: 6-1 through 6-6** **Chapter 7: 7-1 through 7-3, 7-5, 7-7 through 7-9** **Chapter 9: 9-6**
Apply and extend previous understandings of multiplication and division.	
5.NF.B.3 Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent *continued*	**Chapter 5: 5-8** **Chapter 8: 8-6 & 8-7**

NUMBERS AND OPERATIONS-FRACTIONS

Grade 5 Content Standards	*Sadlier Math*, Grade 5
the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 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 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.*	
5.NF.B.4 Solve the equation $(a/b) \times (c/d) = ac/bd$.) *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15.*	**Chapter 8: 8-1 through 8-3, 8-5, 8-8 & 8-9**
5.NF.B.4b Find the area of a rectangle with fractional side lengths by tiling it with unit squares 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.	**Chapter 8: 8-10**
5.NF.B.5 Interpret multiplication as scaling (resizing), by:	
5.NF.B.5a Comparing 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.	**Chapter 8: 8-4**
5.NF.B.5b Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b =$ *continued*	**Chapter 8: 8-4**

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NUMBERS AND OPERATIONS-FRACTIONS

Grade 5 Content Standards	*Sadlier Math*, Grade 5
($n \times a$)/($n \times b$) to the effect of multiplying a/b by 1.	
5.NF.B.6 Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	**Chapter 8: 8-2 & 8-3** **Chapter 9: 9-6**
5.NF.B.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.	
5.NF.B.7a Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.*	**Chapter 9: 9-3 through 9-5**
5.NF.B.7b Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.*	**Chapter 9: 9-2**
5.NF.B.7c Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*	**Chapter 9: 9-6 & 9-7**

INTEGERS

Grade 5 Content Standards	*Sadlier Math*, Grade 5
Add and subtract integers and rational numbers.	
5.I.A.1 Understand integer subtraction as the inverse of integer addition.	**See Grade 6 related content** **Chapter 9: 9-1 & 9-3**
5.I.A.2 Add and subtract integers between -10 and 10. Use the number line and chip models for addition and subtraction.	**See Grade 6 related content** **Chapter 9: 9-1 & 9-3**
5.I.A.3 Add, subtract, multiply, and divide positive rational numbers fluently.	**Chapter 3: 3-1 through 3-8** **Chapter 4: 4-1 through 4-8** **Chapter 6: 6-1 through 6-6** **Chapter 7: 7-1 through 7-8** **Chapter 8: 8-1 through 8-9** **Chapter 9: 9-1 through 9-5** **Chapter 10: 10-1 through 10-7** **Chapter 11: 11-1 through 11-5** **Chapter 12: 12-1 through 12-8**

MEASUREMENT AND DATA

Grade 5 Content Standards	*Sadlier Math*, Grade 5
Convert like measurement units within a given measurement system.	
5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	**Chapter 14: 14-1 through 14-9**

Represent and interpret data.	
5.MD.B.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given* *continued*	**Chapter 17: 17-1 & 17-2**

MEASUREMENT AND DATA

Grade 5 Content Standards	*Sadlier Math*, Grade 5
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.	

Geometric measurement: understand concepts of volume.

5.MD.C.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement.	
5.MD.C.3a 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.	**Chapter 16: 16-1 through 16-3**
5.MD.C.3b 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.	**Chapter 16: 16-2 & 16-3**
5.MD.C.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft and other real world units.	**Chapter 16: 16-2 & 16-3**
5.MD.C.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.	
5.MD.C.5a Find the volume of a 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. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.	**Chapter 16: 16-3 & 16-6**
5.MD.C.5b Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of rectangular prisms with whole- *continued*	**Chapter 16: 16-4**

MEASUREMENT AND DATA

Grade 5 Content Standards	*Sadlier Math*, Grade 5
number edge lengths in the context of solving real world and mathematical problems.	
5.MD.C.5c Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	**Chapter 16: 16-5**
5.MD.C.5d Analyze and interpret dot plots, circle graphs, stem and leaf plots, histograms, box and whisker plots.	**See Grade 6** **Chapter 17: 17-1 through 17-5**
5.MD.D.6 Apply the formula for surface area of a rectangular prism. $2ab + 2bc + 2ac$	**See Grade 6** **Chapter 15: 15-2**

Find areas of geometric shapes using formulas.

5.MD.D.7 Represent relationships between areas of rectangles, triangles, and parallelograms using models	**See Grade 6** **Chapter 14: 14-1 through 14-3**
5.MD.D.8 Understand and know how to use the area formula of a triangle; $A = 1/2\ bh$, and represent using models and manipulatives.	**See Grade 6** **Chapter 14: 14-2**
5.MD.D.9 Understand and know how to use the area formula for a parallelogram: $A = bh$ and represent using models and manipulatives.	**See Grade 6** **Chapter 14: 14-1**
5.MD.D.10 Understand and know how to use the circumference and area formula of a circle.	**See Grade 6** **Chapter 14: 14-4**

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GEOMETRY

Grade 5 Content Standards	*Sadlier Math*, Grade 5

Graph points on the coordinate plane to solve real-world and mathematical problems.

5.G.A.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 (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate).	**Chapter 17: 17-3**
5.G.A.2 Represent real world and mathematical problems by graphing points in a quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	**Chapter 17: 17-4**

Classify two-dimensional figures into categories based on their properties.

5.G.B.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.	**Chapter 15: 15-1 through 15-5**
5.G.B.4 Classify two-dimensional figures in a hierarchy based on properties.	**Chapter 15: 15-2, 15-4 & 15-5**

Know the meaning of angles, and solve problems.

5.G.C.5 Proficiently associate and angle with a certain amount of turning; know that angles are measured in degrees; understand that *continued*	**See Grade 4** **Chapter 16: 16-2**

GEOMETRY

Grade 5 Content Standards	*Sadlier Math*, Grade 5
90°, 180°, 270°, and 360° are associated respectively, with ¼, ½, and ¾, and full turn.	
5.G.C.6 Proficiently measure angles with a protractor and classify them as acute, right, obtuse, or straight.	**See Grade 4** **Chapter 16: 16-3**
5.G.C.7 Proficiently identify and name angles on a straight line and vertical angles.	**See Grade 4** **Chapter 16: 16-2**
5.G.C.8 Proficiently find unknown angles in problems involving angles on a straight line, angles surrounding a point, and vertical angles.	**See Grade 4** **Chapter 16: 16-4**
5.G.C.9 Know that angles on a straight line add up to 180° and angles surrounding a point add up to 360°; justify informally by "surrounding" a point with angles.	**n/a**
5.G.C.10 Understand why the sum of the interior angles of a triangle is 180° and the sum of the interior angles of a quadrilateral is 360°, and use these properties to solve problems.	**n/a**
5.G.C.11 Find unknown angles and sides using the properties of: triangles, including right, isosceles, and equilateral triangles; parallelograms, including rectangles and rhombuses; and trapezoids.	**n/a**

DATA AND PROBABILITY

Grade 5 Content Standards	*Sadlier Math*, Grade 5
Construct and interpret line graphs.	
5.DP.A.1 Read and interpret line graphs, bar graphs, pie charts and pictograms. Solve problems based on graph information.	**See Grade 4** **Chapter 15: 15-5 & 15-8**

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DATA AND PROBABILITY

Grade 5 Content Standards	*Sadlier Math*, Grade 5
5.DP.A.2 Construct graphs from tables of data; include axis labels and scale.	**See Grade 3** **Chapter 12: 12-2 & 12-4**

Find and interpret mean and mode for a given set of data.	
5.DP.B.3 Given a set of data, find and interpret the mean, median, mode, and range.	**See Grade 6** **Chapter 17: 17-4**
5.DP.B.4 Solve word problems involving mean, median, mode, and range.	**See Grade 6** **Chapter 17: 17-6**
5.DP.B.5 Understand the concept of an outlier and explain how that may affect a given set of data.	**See Grade 6** **Chapter 17: 17-1, 17-4 & 17-6**