SADLIER

Common Core Progress Mathematics

SADLIER PROGRESS IN MATHEMATICS

Foundations of Algebra

Common Core State Standards for Mathematics

Crosswalk

Grade 8

Contents

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Unit 1: Focus on the Number System				
Lesson 1	**Understand Rational and Irrational Numbers**—pp. 10–17	**Instruction** 1-1 The Rational Numbers—TE pp. 2–3B; SB pp. 2–3 / PB pp. 1–2 1-2 The Rational Numbers on a Number Line—TE pp. 4–5B; SB pp. 4–5 / PB pp. 3–4 2-5 Irrational Numbers—TE pp. 44–45B; SB pp. 44–45 / PB pp. 47–48	**8.NS.1** **8.NS.A.1**	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
Lesson 2	**Use Rational Approximations of Irrational Numbers**—pp. 18–25	**Instruction** 2-4 Estimate Square Roots—TE pp. 42–43B; SB pp. 42–43 / PB pp. 45–46 2-5 Irrational Numbers—TE pp. 44–45B; SB pp. 44–45 / PB pp. 47–48	**8.NS.2** **8.NS.A.2**	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). *For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*
Unit 2: Focus on Expressions and Equations				
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Lesson 4	**Learn Properties of Exponents**—pp. 40–47			
Lesson 5	**Use Properties of Exponents Generate Equivalent Expressions**—pp. 48–55			

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Lesson 7	**Solve Simple Equations Involving Squares and Cubes**—pp. 64–71			
Lesson 8	**Estimate and Compare Large or Small Quantities**—pp. 72–79	**Instruction** 2-1 Scientific Notation—TE pp. 36–37B; SB pp. 36–37 / PB pp. 39–40 2-2 Multiply and Divide in Scientific Notation—TE pp. 38–39B; SB pp. 38–39 / PB pp. 41–42	**8.EE.3** **8.EE.A.3**	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as 3 times 10^8 and the population of the world as 7 times 10^9, and determine that the world population is more than 20 times larger.*
Lesson 9	**Calculate with Numbers in Scientific Notation**—pp. 80–87	**Instruction** 2-2 Multiply and Divide in Scientific Notation—TE pp. 38–39B; SB pp. 38–39 / PB pp. 41–42	**8.EE.4** **8.EE.A.4**	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.
Lesson 10	**Understand Proportional Relationships and Slope**—pp. 88–95	**Instruction** 6-9 Direct Variation—TE pp. 172–173B; SB pp. 172–173 / PB pp. 191–192 7-1 Ratios, Rates, and Unit Rates—TE pp. 188–189B; SB pp. 188–189 / PB pp. 211–212 7-3 Conversion Factors and Measurement Systems—TE pp. 192–193B; SB pp. 192–193 / PB pp. 215–216 7-5 Direct Proportions—TE pp. 196–197B; SB pp. 196–197 / PB pp. 219–220 *7-5A Proportions and Unit Rates—Online	**8.EE.5** **8.EE.B.5**	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*

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Lesson 11 **Understand Slope**—pp. 96–103 **Lesson 12** **Write Equations for Lines**—pp. 104–111	**Instruction** 6-6 Linear Functions: Standard Form and Slope-Intercept Form—TE pp. 166–167B; SB pp. 166–167 / PB pp. 185–186 6-9 Direct Variation—TE pp. 172–173B; SB pp. 172–173 / PB pp. 191–192 10-7 Coordinate Plane and Polygons—TE pp. 278–279B; SB pp. 278–279 / PB pp. 313–314	**8.EE.6** **8.EE.B.6** Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.
Lesson 13 **Solve Linear Equations**—pp. 112–119	**Instruction** 3-3 Equations—TE pp. 68–69B; SB pp. 68–69 / PB pp. 75–76 *3-5A Identify Equations with One, Many, or No Solutions—Online *3-5B Solve Equations with One, Many, or No Solutions—Online	**8.EE.7a** **8.EE.C.7a** Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).
	Instruction 1-15 Problem-Solving Strategy: Make a Drawing—TE pp. 30–31B; SB pp. 30–31 / PB pp. 29–30 3-3 Equations—TE pp. 68–69B; SB pp. 68–69 / PB pp. 75–76 3-4 One-Step Addition and Subtraction Equations—TE pp. 70–71B; SB pp. 70–71 / PB pp. 77–78 3-5 One-Step Multiplication and Division Equations—TE pp. 72–73B; SB pp. 72–73 / PB pp. 79–80 3-6 Model Two-Step Equations—TE pp. 74–75B; SB pp. 74–75 / PB pp. 81–82 3-7 Two-Step Equations—TE pp. 76–77B; SB pp. 76–77 / PB pp. 83–84 3-8 Multistep Equations with Grouping Symbols—TE pp. 78–79B; SB pp. 78–79 / PB pp. 85–86 3-9 Multistep Equations with Variables on Both Sides—TE pp. 80–81B; SB pp. 80–81 / PB pp. 87–88 3-10 Multistep Equations: Fractions and Decimals—TE pp. 82–83B; SB pp. 82–83 / PB pp. 89–90	**8.EE.7b** **8.EE.C.7b** Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

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		3-14 Problem-Solving Strategy: Guess and Test—TE pp. 90–91B; SB pp. 90–91 / PB pp. 97–98 6-14 Problem-Solving Strategy: Reason Logically—TE pp. 182–183B; SB pp. 182–183 / PB pp. 201–202 7-2 Proportions—TE pp. 190–191B; SB pp. 190–191 / PB pp. 213–214 7-12 Problem-Solving Strategy: Solve a Simpler Problem—TE pp. 210–211B; SB pp. 210–211 / PB pp. 233–234 9-13 Problem-Solving Strategy: Adopt a Different Point of View—TE pp. 260–261B; SB pp. 260–261 / PB pp. 291–292 10-12 Problem-Solving Strategy: Work Backward—TE pp. 288–289B; SB pp. 288–289 / PB pp. 323–324 **Application** 12-11 Problem-Solving Strategy: Review of Strategies (Find a Pattern/Adopt a Different Point of View)—TE pp. 338–339B; SB pp. 338–339 / PB pp. 381–382	
Lesson 14	**Solve Systems of Equations**—pp. 120–127	**Instruction** 6-1 Relations and Functions—TE pp. 156–157B; SB pp. 156–157 / PB pp. 175–176 6-2 Graphs of Functions—TE pp. 158–159B; SB pp. 158–159 / PB pp. 177–178	**8.EE.8a** **8.EE.C.8a**	Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
		Instruction 3-14 Problem-Solving Strategy: Guess and Test—TE pp. 90–91B; SB pp. 90–91 / PB pp. 97–98 6-10 Solve Systems of Equations by Graphing—TE pp. 174–175B; SB pp. 174–175 / PB pp. 193–194 6-11 Solve Systems of Equations by Substitution and Elimination—TE pp. 176–177B; SB pp. 176–177 / PB pp. 195–196 6-14 Problem-Solving Strategy: Reason Logically—TE pp. 182–183B; SB pp. 182–183 / PB pp. 201–202	**8.EE.8b** **8.EE.C.8b**	Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.*

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Lesson 15 **Problem-Solving: Systems of Equations**—pp. 128–135	**Instruction** 3-14 Problem-Solving Strategy: Guess and Test—TE pp. 90–91B; SB pp. 90–91 / PB pp. 97–98 6-10 Solve Systems of Equations by Graphing—TE pp. 174–175B; SB pp. 174–175 / PB pp. 193–194 6-11 Solve Systems of Equations by Substitution and Elimination—TE pp. 176–177B; SB pp. 176–177 / PB pp. 195–196 *6-11A Use Systems to Solve Problems—Online 11-10 Problem-Solving Strategy: Account for All Possibilities—TE pp. 312–313B; SB pp. 312–313 / PB pp. 351–352	**8.EE.8c** **8.EE.C.8c** Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*
Unit 3: Focus on Functions		
Lesson 16 **Understand Functions**—pp. 142–149	**Instruction** 6-1 Relations and Functions—TE pp. 156–157B; SB pp. 156–157 / PB pp. 175–176 6-2 Graphs of Functions—TE pp. 158–159B; SB pp. 158–159 / PB pp. 177–178	**8.F.1** **8.F.A.1** Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
Lesson 17 **Represent Functions**—pp. 150–157	**Instruction** 6-1 Relations and Functions—TE pp. 156–157B; SB pp. 156–157 / PB pp. 175–176 6-2 Graphs of Functions—TE pp. 158–159B; SB pp. 158–159 / PB pp. 177–178 *6-2A Compare Functions—Online	**8.F.1** **8.F.A.1** Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. **8.F.2** **8.F.A.2** Compare properties of two functions each represented in a different way (algebraically,

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				– continued from previous page – graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*
Lesson 18	**Compare Functions**—pp. 158–165	**Instruction** 6-2 Graphs of Functions—TE pp. 158–159B; SB pp. 158–159 / PB pp. 177–178 *6-2A Compare Functions—Online	**8.F.2** **8.F.A.2**	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*
Lesson 19	**Investigate Linear and Non-Linear Functions**—pp. 166–173	**Instruction** 6-6 Linear Functions: Standard Form and Slope-Intercept Form—TE pp. 166–167B; SB pp. 166–167 / PB pp. 185–186 11-6 Nonlinear Functions: Quadratic—TE pp. 304–305B; SB pp. 304–305 / PB pp. 343–344 11-7 Other Nonlinear Functions—TE pp. 306–307B; SB pp. 306–307 / PB pp. 345–346 11-9 Technology: Graphs of Nonlinear Functions—TE pp. 310–311B; SB pp. 310–311 / PB pp. 349–350	**8.F.3** **8.F.A.3**	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.*
Lesson 20	**Use Functions to Model Relationships**—pp. 174–181	**Instruction** 6-1 Relations and Functions—TE pp. 156–157B; SB pp. 156–157 / PB pp. 175–176 6-2 Graphs of Functions—TE pp. 158–159B; SB pp. 158–159 / PB pp. 177–178	**8.F.4** **8.F.B.4**	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and
Lesson 21	**Problem Solving: Use Linear Models**—pp. 182–189			

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		– continued from previous page – initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
Lesson 22 **Analyze Graphs of Functions**—pp. 190–197	**Instruction** 6-4 Slope of a Line—TE pp. 162–163B; SB pp. 162–163 / PB pp. 181–182 6-5 The *x*- and *y*-Intercepts of a Line—TE pp. 164–165B; SB pp. 164–165 / PB pp. 183–184 6-6 Linear Functions: Standard Form and Slope-Intercept Form—TE pp. 166–167B; SB pp. 166–167 / PB pp. 185–186 6-7 Linear Functions: Point-Slope Form—TE pp. 168–169B; SB pp. 168–169 / PB pp. 187–188 11-5 Find Function Values—TE pp. 302–303B; SB pp. 302–303 / PB pp. 341–342 12-11 Problem-Solving Strategy: Review of Strategies (Find a Pattern/Adopt a Different Point of View)—TE pp. 338–339B; SB pp. 338–339 / PB pp. 381–382	**8.F.5** **8.F.B.5** Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
Unit 4: Focus on Geometry		
		8.G.1 **8.G.A.1** Verify experimentally the properties of rotations, reflections, and translations:
Lesson 23 **Verify Properties of Reflections and Translations**—pp. 204–211	**Instruction** *10-9A Properties of Rigid Transformations—Online	**8.G.1a** **8.G.A.1a** Lines are taken to lines, and line segments to line segments of the same length.
Lesson 24 **Verify Properties of Rotations**—pp. 212–219		**8.G.1b** **8.G.A.1b** Angles are taken to angles of the same measure.
		8.G.1c **8.G.A.1c** Parallel lines are taken to parallel lines.

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		9-1 Angle Pairs—TE pp. 236–237B; SB pp. 236–237 / PB pp. 267–268 9-2 Angles of Parallel Lines—TE pp. 238–239B; SB pp. 238–239 / PB pp. 269–270 9-4 Angles of Polygons—TE pp. 242–243B; SB pp. 242–243 / PB pp. 273–274 *9-4A Angle-Angle Criterion for Similar Triangles—Online		*For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*
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Unit 5: Focus on Statistics and Probability		
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Lesson 38 **Fit Linear Models to Data**—pp. 330–337	**Instruction** 6-3 Scatter Plots—TE pp. 160–161B; SB pp. 160–161 / PB pp. 179–180	**8.SP.2** **8.SP.A.2** Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.
Lesson 39 **Problem Solving: Use Linear Models**—pp. 338–345	**Instruction** *6-7A Analyzing Trend Lines—Online *6-7B Use Linear Models to Solve Problems—Online	**8.SP.3** **8.SP.B.3** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.*
Lesson 40 **Analyze Data in Two-Way Tables**—pp. 346–353	**Instruction** 2-12 Problem-Solving Strategy: Organize Data—TE pp. 58–59B; SB 58–59 / PB pp. 61–62 11-10 Problem-Solving Strategy: Account for All Possibilities—TE pp. 312–313B; SB pp. 312–313 / PB pp. 351–352 *13-5A Patterns of Association in Categorical Data—Online *13-5B Examine Patterns of Association—Online	**8.SP.4** **8.SP.B.4** Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.

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		– continued from previous page – *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*