SADLIER PROGRESS IN MATHEMATICS

Foundations of Algebra

SADLIER

Common Core Progress Mathematics

Common Core State Standards for Mathematics

Grade 8 Crosswalk

Sadlier
William H. Sadlier, Inc.
www.sadlierschool.com
800-221-5175

Chapter 1 Rational Numbers

Foundations of Algebra, Grade 8		Common Core Progress Mathematics, Grade 8		Common Core State Standards for Mathematics, Grade 8	
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				
1-3	**Greatest Common Factor (GCF)**—TE pp. 6–7B; SB pp. 6–7 / PB pp. 5–6				
1-4	**Multiples: LCM and LCD**—TE pp. 8–9B; SB pp. 8–9 / PB pp. 7–8				
1-5	**Compare and Order Rational Numbers**—TE pp. 10–11 B; SB pp. 10–11 / PB pp. 9–10				
1-6	**Estimate with Rational Numbers**—TE pp. 12–13 B; SB pp. 12–13 / PB pp. 11–12				
1-7	**Add Rational Numbers**—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14				
1-8	**Subtract Rational Numbers**—TE pp. 16–17B; SB pp. 16–17 / PB pp. 15–16				
1-9	**Multiply Rational Numbers**—TE pp. 18–19B; SB pp. 18–19 / PB pp. 17–18				
1-10	**Divide Rational Numbers**—TE pp. 20–21B; SB pp. 20–21 / PB pp. 19–20				
1-11	**Properties of Rational Numbers**—TE pp. 22–23B; SB pp. 22–23 / PB pp. 21–22				
1-12	**Integral Exponents**—TE pp. 24–25B; SB pp. 24–25 / PB pp. 23–24	**Lesson 3**	**Understand Zero and Negative Exponent**—pp. 32–39	8.EE.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.*
1-13	**Powers and Exponents**—TE pp. 26–27B; SB pp. 26–27 / PB pp. 25–26	**Lesson 4**	**Learn Properties of Exponents**—pp. 40–47		
		Lesson 5	**Use Properties of Exponents Generate Equivalent Expressions**—pp. 48–55		
1-14	**Order of Operations with Rational Numbers**—TE pp. 28–29B; SB pp. 28–29 / PB pp. 27–28				

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 1 Rational Numbers

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
1-15 **Problem-Solving Strategy: Make a Drawing**—TE pp. 30–31B; SB pp. 30–31 / PB pp. 29–30	**Lesson 13** **Solve Linear Equations**—pp. 112–119	8.EE.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Chapter 2 Real Numbers

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
2-1 **Scientific Notation**—TE pp. 36–37B; SB pp. 36–37 / PB pp. 39–40	**Lesson 8** **Estimate and Compare Large or Small Quantities**—pp. 72–79	8.EE.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.*
2-2 **Multiply and Divide in Scientific Notation**—TE pp. 38–39B; SB pp. 38–39 / PB pp. 41–42	**Lesson 8** **Estimate and Compare Large or Small Quantities**—pp. 72–79	8.EE.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	8.EE.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

– continued on next page –

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 2 Real Numbers

Foundations of Algebra, Grade 8		Common Core Progress Mathematics, Grade 8		Common Core State Standards for Mathematics, Grade 8	
					– continued from previous page –
					millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology
2-3	**Perfect Squares and Square Roots**—TE pp. 40–41B; SB pp. 40–41 / PB pp. 43–44	**Lesson 6**	**Evaluate Square Roots and Cube Roots**—pp. 56–63	8.EE.2	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
		Lesson 7	**Solve Simple Equations Involving Squares and Cubes**—pp. 64–71		
2-4	**Estimate Square Roots**—TE pp. 42–43B; SB pp. 42–43 / PB pp. 45–46	**Lesson 2**	**Use Rational Approximations of Irrational Numbers**—pp. 18–25	8.NS.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.*
2-5	**Irrational Numbers**—TE pp. 44–45B; SB pp. 44–45 / PB pp. 47–48	**Lesson 2**	**Use Rational Approximations of Irrational Numbers**—pp. 18–25	8.NS.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.*
		Lesson 6	**Evaluate Square Roots and Cube Roots**—pp. 56–63	8.EE.2	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
		Lesson 7	**Solve Simple Equations Involving Squares and Cubes**—pp. 64–71		

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 2 Real Numbers

Foundations of Algebra, Grade 8		Common Core Progress Mathematics, Grade 8		Common Core State Standards for Mathematics, Grade 8	
2-6	**Square Roots as Irrational Numbers**—TE pp. 46–47B; SB 46–47 / PB pp. 49–50				
2-7	**The Real Number System**—TE pp. 48–49B; pp. SB 48–49 / PB pp. 51–52				
2-8	**Properties of Real Numbers**—TE pp. 50–51B; pp. SB 50–51 / PB pp. 53–54				
2-9	**Pythagorean Theorem**—TE pp. 52–53B; SB pp. 52–53 / PB pp. 55–56	**Lesson 32**	**Understand the Pythagorean Theorem**—pp. 276–283	8.G.6	Explain a proof of the Pythagorean Theorem and its converse.
		Lesson 33	**Understand the Converse of the Pythagorean Theorem**—pp. 284–291		
		Lesson 34	**Problem Solving: The Pythagorean Theorem**—pp. 292–299	8.G.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
***2-9A**	**Proof of the Pythagorean Theorem**—Online	**Lesson 32**	**Understand the Pythagorean Theorem**—pp. 276–283	8.G.6	Explain a proof of the Pythagorean Theorem and its converse.
		Lesson 33	**Understand the Converse of the Pythagorean Theorem**—pp. 284–291		
2-10	**Special Right Triangles**—TE pp. 54–55B; SB pp. 54–55 / PB pp. 57–58				
2-11	**Technology: Evaluate Powers and Roots**—TE pp. 56–57B; SB pp. 56–57 / PB pp. 59–60				
2-12	**Problem-Solving Strategy: Organize Data**—TE pp. 58–59B; SB 58–59 / PB pp. 61–62	**Lesson 40**	**Analyze Data in Two-Way Tables**—pp. 346–353	8.SP.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.

– continued on next page –

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 2 Real Numbers

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
		– 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?*

Chapter 3 Expressions and Equations

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
3-1 **Mathematical Expressions**—TE pp. 64–65B; SB pp. 64–65 / PB pp. 71–72		
3-2 **Simplify and Evaluate Algebraic Expressions**—TE pp. 66–67B; SB pp. 66–67 / PB pp. 73–74		
3-3 **Equations**—TE pp. 68–69B; SB pp. 68–69 / PB pp. 75–76	**Lesson 13** **Solve Linear Equations**—pp. 112–119	8.EE.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).
3-4 **One-Step Addition and Subtraction Equations**—TE pp. 70–71B; SB pp. 70–71 / PB pp. 77–78		8.EE.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
3-5 **One-Step Multiplication and Division Equations**—TE pp. 72–73B; SB pp. 72–73 / PB pp. 79–80		
***3-5A** **Identify Equations with One, Many, or No Solutions**—Online	**Lesson 13** **Solve Linear Equations**—pp. 112–119	8.EE.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

– continued on next page –

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 3 Expressions and Equations

Foundations of Algebra, Grade 8		Common Core Progress Mathematics, Grade 8		Common Core State Standards for Mathematics, Grade 8	
					– continued from previous page –
					forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).
				8.EE.7b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
***3-5B**	**Solve Equations with One, Many, or No Solutions**—Online	**Lesson 13**	**Solve Linear Equations**—pp. 112–119	8.EE.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).
3-6	**Model Two-Step Equations**—TE pp. 74–75B; SB pp. 74–75 / PB pp. 81–82	**Lesson 13**	**Solve Linear Equations**—pp. 112–119	8.EE.7b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
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				

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 3 Expressions and Equations

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
3-11 **Equations: Repeating Decimals as Rational Numbers**—TE pp. 84–85B; SB pp. 84–85 / PB pp. 91–92		
3-12 **Absolute-Value Equations**—TE pp. 86–87B; SB pp. 86–87 / PB pp. 93–94		
3-13 **Literal Equations**—TE pp. 88–89B; SB pp. 88–89 / PB pp. 95–96		
3-14 **Problem-Solving Strategy: Guess and Test**—TE pp. 90–91B; SB pp. 90–91 / PB pp. 97–98	**Lesson 13** **Solve Linear Equations**—pp. 112–119	8.EE.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
	Lesson 14 **Solve Systems of Equations**—pp. 120–127	8.EE.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.*
	Lesson 15 **Problem-Solving: Systems of Equations**—pp. 128–135	8.EE.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.*

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 4 Inequalities

Foundations of Algebra, Grade 8		Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
4-1	**Inequalities**—TE pp. 96–97B; SB pp. 96–97 / PB pp. 107–108		
4-2	**Inequalities: Solution Set**—TE pp. 98–99B; SB pp. 98–99 / PB pp. 109–110		
4-3	**One-Step Addition Inequalities**—TE pp. 100–101B; SB pp. 100–101 / PB pp. 111–112		
4-4	**One-Step Subtraction Inequalities**—TE pp. 102–103B; SB pp. 102–103 / PB pp. 113–114		
4-5	**One-Step Multiplication Inequalities**—TE pp. 104–105B; SB pp. 104–105 / PB pp. 115–116		
4-6	**One-Step Division Inequalities**—TE pp. 106–107B; SB pp. 106–107 / PB pp. 117–118		
4-7	**Two-Step Inequalities**—TE pp. 108–109B; SB pp. 108–109 / PB pp. 119–120		
4-8	**Multistep Inequalities with Grouping Symbols**—TE pp. 110–111B; SB pp. 110–111 / PB pp. 121–122		
4-9	**Multistep Inequalities with Variables on Both Sides**—TE pp. 112–113B; SB pp. 112–113 / PB pp. 123–124		
4-10	**Multistep Inequalities: Fractions and Decimals**—TE pp. 114–115B; SB pp. 114–115 / PB pp. 125–126		
4-11	**Compound Inequalities**—TE pp. 116–117B; SB pp. 116–117 / PB pp. 127–128		
4-12	**Problem Solving: Review of Strategies**—TE pp. 118–119B; SB pp. 118–119 / PB pp. 129–130		

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 5 Polynomials and Factoring

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
5-1 **Polynomials**—TE pp. 124–125B; SB pp. 124–125 / PB pp. 139–140		
5-2 **Degree of a Polynomial**—TE pp. 126–127B; SB pp. 126–127 / PB pp. 141–142		
5-3 **Modeling Polynomials**—TE pp. 128–129B; SB pp. 128–129 / PB pp. 143–144		
5-4 **Add Polynomials**—TE pp. 130–131B; SB pp. 130–131 / PB pp. 145–146		
5-5 **Subtract Polynomials**—TE pp. 132–133B; SB pp. 132–133 / PB pp. 147–148		
5-6 **Multiply by Monomials**—TE pp. 134–135B; SB pp. 134–135 / PB pp. 149–150		
5-7 **Multiply Binomials**—TE pp. 136–137B; SB pp. 136–137 / PB pp. 151–152		
5-8 **More Binomials Special Cases**—TE pp. 138–139B; SB pp. 138–139 / PB pp. 153–154		
5-9 **Divide by Monomials**—TE pp. 140–141B; SB pp. 140–141 / PB pp. 155–156		
5-10 **Factoring Using the GCF**—TE pp. 142–143B; SB pp. 142–143 / PB pp. 157–158		
5-11 **Factoring Trinomials: $x^2 + bx + c$**—TE pp. 144–145B; SB pp. 144–145 / PB pp. 159–160		
5-12 **Factoring Special Products**—TE pp. 146–147B; SB pp. 146–147 / PB pp. 161–162		
5-13 **Factoring Trinomials: $ax^2 + bx + c$**—TE pp. 148–149B; SB pp. 148–149 / PB pp. 163–164		
5-14 **Problem-Solving Strategy: Find a Pattern**—TE pp. 150–151B; SB pp. 150–151 / PB pp. 165–166		

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 6 Linear Functions and Inequalities

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8	
6-1 **Relations and Functions**—TE pp. 156–157B; SB pp. 156–157 / PB pp. 175–176	**Lesson 14** **Solve Systems of Equations**—pp. 120–127	8.EE.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.
	Lesson 16 **Understand Functions**—pp. 142–149	8.F.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		
	Lesson 20 **Use Functions to Model Relationships**—pp. 174–181	8.F.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 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 21 **Problem Solving: Use Linear Models**—pp. 182–189		
6-2 **Graphs of Functions**—TE pp. 158–159B; SB pp. 158–159 / PB pp. 177–178	**Lesson 14** **Solve Systems of Equations**—pp. 120–127	8.EE.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.
	Lesson 16 **Understand Functions**—pp. 142–149	8.F.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		
	Lesson 17 **Represent Functions**—pp. 150–157	8.F.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
	Lesson 18 **Compare Functions**—pp. 158–165		

– continued on next page –

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 6 Linear Functions and Inequalities

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
		– continued from previous page – *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 20 **Use Functions to Model Relationships**—pp. 174–181 **Lesson 21** **Problem Solving: Use Linear Models**—pp. 182–189	8.F.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 initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
***6-2A** **Compare Functions**—Online	**Lesson 17** **Represent Functions**—pp. 150–157 **Lesson 18** **Compare Functions**—pp. 158–165	8.F.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 37 **Construct and Interpret Scatter Plots**—pp. 322–329	8.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 6 Linear Functions and Inequalities

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
6-3 **Scatter Plots**—TE pp. 160–161B; SB pp. 160–161 / PB pp. 179–180	**Lesson 37** **Construct and Interpret Scatter Plots**—pp. 322–329	8.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
	Lesson 38 **Fit Linear Models to Data**—pp. 330–337	8.SP.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.
***6-3A** **Analyze Outliers**—Online ***6-3B** **Clustering**—Online	**Lesson 37** **Construct and Interpret Scatter Plots**—pp. 322–329	8.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
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	**Lesson 22** **Analyze Graphs of Functions**—pp. 190–197	8.F.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.
6-6 **Linear Functions: Standard Form and Slope-Intercept Form**—TE pp. 166–167B; SB pp. 166–167 / PB pp. 185–186	**Lesson 11** **Understand Slope**—pp. 96–103 **Lesson 12** **Write Equations for Lines**—pp. 104–111	8.EE.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 19 **Investigate Linear and Non-Linear Functions**—pp. 166–173	8.F.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.

– continued on next page –

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 6 Linear Functions and Inequalities

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
		– continued from previous page – *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.*
6-7 **Linear Functions: Point-Slope Form**—TE pp. 168–169B; SB pp. 168–169 / PB pp. 187–188	**Lesson 22** **Analyze Graphs of Functions**—pp. 190–197	8.F.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.
***6-7A** **Analyzing Trend Lines**—Online	**Lesson 37** **Construct and Interpret Scatter Plots**—pp. 322–329	8.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
	Lesson 39 **Problem Solving: Use Linear Models**—pp. 338–345	8.SP.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.*
***6-7B** **Use Linear Models to Solve Problems**—Online	**Lesson 39** **Problem Solving: Use Linear Models**—pp. 338–345	8.SP.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* – continued on next page –

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 6 Linear Functions and Inequalities

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
		– continued from previous page – *meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.*
6-8 **Parallel Lines and Perpendicular Lines**—TE pp. 170–171B; SB pp. 170–171 / PB pp. 189–190		
6-9 **Direct Variation**—TE pp. 172–173B; SB pp. 172–173 / PB pp. 191–192	**Lesson 10** **Understand Proportional Relationships and Slope**—pp. 88–95	8.EE.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.*
	Lesson 11 **Understand Slope**—pp. 96–103 **Lesson 12** **Write Equations for Lines**—pp. 104–111	8.EE.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.
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	**Lesson 14** **Solve Systems of Equations**—pp. 120–127	8.EE.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.*
	Lesson 15 **Problem-Solving: Systems of Equations**—pp. 128–135	8.EE.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.*

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 6 Linear Functions and Inequalities

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
***6-11A** **Use Systems to Solve Problems**—Online	**Lesson 15** **Problem-Solving: Systems of Equations**—pp. 128–135	8.EE.8.c 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.*
6-12 **Linear Inequalities in Two Variables**—TE pp. 178–179B; SB pp. 178–179 / PB pp. 197–198		
6-13 **Systems of Linear Inequalities**—TE pp. 180–181B; SB pp. 180–181 / PB pp. 199–200		
6-14 **Problem-Solving Strategy: Reason Logically**—TE pp. 182–183B; SB pp. 182–183 / PB pp. 201–202	**Lesson 13** **Solve Linear Equations**—pp. 112–119	8.EE.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
	Lesson 14 **Solve Systems of Equations**—pp. 120–127	8.EE.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.*

Chapter 7 Ratio and Proportion

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
7-1 **Ratios, Rates, and Unit Rates**—TE pp. 188–189B; SB pp. 188–189 / PB pp. 211–212	**Lesson 10** **Understand Proportional Relationships and Slope**—pp. 88–95	8.EE.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.*

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 7 Ratio and Proportion

Foundations of Algebra, Grade 8		Common Core Progress Mathematics, Grade 8		Common Core State Standards for Mathematics, Grade 8	
7-2	**Proportions**—TE pp. 190–191B; SB pp. 190–191 / PB pp. 213–214	**Lesson 13**	**Solve Linear Equations**—pp. 112–119	8.EE.7b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
7-3	**Conversion Factors and Measurement Systems**—TE pp. 192–193B; SB pp. 192–193 / PB pp. 215–216	**Lesson 10**	**Understand Proportional Relationships and Slope**—pp. 88–95	8.EE.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.*
7-4	**Dimensional Analysis**—TE pp. 194–195B; SB pp. 194–195 / PB pp. 217–218				
7-5	**Direct Proportions**—TE pp. 196–197B; SB pp. 196–197 / PB pp. 219–220	**Lesson 10**	**Understand Proportional Relationships and Slope**—pp. 88–95	8.EE.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.*
***7-5A**	**Proportions and Unit Rates**—Online				
***7-5B**	**Graph Proportional Relationships**—Online				
***7-5C**	**Compare Proportional Relationships**—Online				
7-6	**Partitive Proportions**—TE pp. 198–199B; SB pp. 198–199 / PB pp. 221–222				
7-7	**Inverse Proportions**—TE pp. 200–201B; SB pp. 200–201 / PB pp. 223–224				
7-8	**Scale Drawings and Scale Models**—TE pp. 202–203B; SB pp. 202–203 / PB pp. 225–226				
7-9	**Similarity**—TE pp. 204–205B; SB pp. 204–205 / PB pp. 227–228	**Lesson 31**	**Establish Facts about Triangles and Angles**—pp. 266–275	8.G.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.
		Lesson 30	**Establish Facts about Parallel Lines and Angles**—pp. 260–265		

– continued on next page –

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 7 Ratio and Proportion

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
		– continued from previous page – *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.*
7-10 **Trigonometric Ratios**—TE pp. 206–207B; SB pp. 206–207 / PB pp. 229–230		
7-11 **Indirect Measurement**—TE pp. 208–209B; SB pp. 208–209 / PB pp. 231–232		
7-12 **Problem-Solving Strategy: Solve a Simpler Problem**—TE pp. 210–211B; SB pp. 210–211 / PB pp. 233–234	**Lesson 13** **Solve Linear Equations**—pp. 112–119	8.EE.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
	Lesson 30 **Establish Facts about Parallel Lines and Angles**—pp. 260–265	8.G.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *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.*
	Lesson 31 **Establish Facts about Triangles and Angles**—pp. 266–275	

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 8 Percent Applications

Foundations of Algebra, Grade 8		Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
8-1	**Fractions, Decimals, and Percents**—TE pp. 216–217B; SB pp. 216–217 / PB pp. 243–244		
8-2	**Estimate Percents**—TE pp. 218–219B; SB pp. 218–219 / PB pp. 245–246		
8-3	**Percentage and Applications**—TE pp. 220–221B; SB pp. 220–221 / PB pp. 247–248		
8-4	**Rate and Applications**—TE pp. 222–223B; SB pp. 222–223 / PB pp. 249–250		
8-5	**Base and Applications**—TE pp. 224–225B; SB pp. 224–225 / PB pp. 251–252		
8-6	**Percent of Change**—TE pp. 226–227B; SB pp. 226–227 / PB pp. 253–254		
8-7	**Simple and Compound Interest**—TE pp. 228–229B; SB pp. 228–229 / PB pp. 255–256		
8-8	**Problem Solving: Review of Strategies**—TE pp. 230–231B; SB pp. 230–231 / PB pp. 257–258		

Chapter 9 Two-Dimensional Geometry

Progress in Mathematics, Grade 8		Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8	
9-1	**Angle Pairs**—TE pp. 236–237B; SB pp. 236–237 / PB pp. 267–268	**Lesson 30**	**Establish Facts about Parallel Lines and Angles**—pp. 260–265	8.G.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *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.*
9-2	**Angles of Parallel Lines**—TE pp. 238–239B; SB pp. 238–239 / PB pp. 269–270	**Lesson 31**	**Establish Facts about Triangles and Angles**—pp. 266–275	
9-3	**Classifying Polygons**—TE pp. 240–241B; SB pp. 240–241 / PB pp. 271–272			

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 9 Two-Dimensional Geometry

Progress in Mathematics, Grade 8		Common Core Progress Mathematics, Grade 8		Common Core State Standards for Mathematics, Grade 8	
9-4	**Angles of Polygons**—TE pp. 242–243B; SB pp. 242–243 / PB pp. 273–274	**Lesson 30**	**Establish Facts about Parallel Lines and Angles**—pp. 260–265	8.G.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *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.*
***9-4 A**	**Angle-Angle Criterion for Similar Triangles**—Online	**Lesson 31**	**Establish Facts about Triangles and Angles**—pp. 266–275		
9-5	**Congruent Polygons**—TE pp. 244–245B; SB pp. 244–245 / PB pp. 275–276	**Lesson 25**	**Understand and Identify Congruent Figures**—pp. 220–227	8.G.2	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
9-6	**Circles**—TE pp. 246–247B; SB pp. 246–247 / PB pp. 277–278				
9-7	**Make Circle Graphs**—TE pp. 248–249B; SB pp. 248–249 / PB pp. 279–280				
9-8	**Angle Constructions**—TE pp. 250–251B; SB pp. 250–251 / PB pp. 281–282				
9-9	**Line Constructions**—TE pp. 252–253B; SB pp. 252–253 / PB pp. 283–284				
9-10	**Triangle Constructions**—TE pp. 254–255B; SB pp. 254–255 / PB pp. 285–286				
9-11	**Angles of Elevation and Depression**—TE pp. 256–257B; SB pp. 256–257 / PB pp. 287–288				
9-12	**Tessellations**—TE pp. 258–259B; SB pp. 258–259 / PB pp. 289–290				
9-13	**Problem-Solving Strategy: Adopt a Different Point of View**—TE pp. 260–261B; SB pp. 260–261 / PB pp. 291–292	**Lesson 13**	**Solve Linear Equations**—pp. 112–119	8.EE.7.b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 9 Two-Dimensional Geometry

Progress in Mathematics, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8	
	Lesson 14 **Solve Systems of Equations**—pp. 120–127	8.EE.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.*
	Lesson 26 **Reflect and Translate Figures on the Coordinate Plane**—pp. 228–235 **Lesson 27** **Rotate Figures on the Coordinate Plane**—pp. 236–243 **Lesson 28** **Dilate Figures on the Coordinate Plane**—pp. 244–251	8.G.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

Chapter 10 Geometric Measures and Coordinate Geometry

Foundations of Algebra, Grade 8		Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
10-1	**Precision and Significant Digits**—TE pp. 266–267B; SB pp. 266–267 / PB pp. 301–302		
10-2	**Perimeter and Missing Dimensions**—TE pp. 268–269B; SB pp. 268–269 / PB pp. 303–304		
10-3	**Area of Polygons**—TE pp. 270–271B; SB pp. 270–271 / PB pp. 305–306		
10-4	**Circumference and Area of Circles**—TE pp. 272–273B; SB pp. 272–273 / PB pp. 307–308		
10-5	**Area of Complex Figures**—TE pp. 274–275B; SB pp. 274–275 / PB pp. 309–310		
10-6	**Area and Missing Dimensions**—TE pp. 276–277B; SB pp. 276–277 / PB pp. 311–312		

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 10 Geometric Measures and Coordinate Geometry

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
10-7 **Coordinate Plane and Polygons**—TE pp. 278–279B; SB pp. 278–279 / PB pp. 313–314	**Lesson 11** **Understand Slope**—pp. 96–103	8.EE.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 12 **Write Equations for Lines**—pp. 104–111	
	Lesson 26 **Reflect and Translate Figures on the Coordinate Plane**—pp. 228–235	8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
	Lesson 27 **Rotate Figures on the Coordinate Plane**—pp. 236–243	
	Lesson 28 **Dilate Figures on the Coordinate Plane**—pp. 244–251	
	Lesson 35 **Calculate Distances in the Coordinate Plane**—pp. 300–307	8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
***10-7A** **Apply Pythagorean Theorem**—Online	**Lesson 35** **Calculate Distances in the Coordinate Plane**—pp. 300–307	8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
10-8 **Coordinate Plane: Reflections and Translations**—TE pp. 280–281B; SB pp. 280–281 / PB pp. 315–316	**Lesson 25** **Understand and Identify Congruent Figures**—pp. 220–227	8.G.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
	Lesson 26 **Reflect and Translate Figures on the Coordinate Plane**—pp. 228–235	8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
	Lesson 27 **Rotate Figures on the Coordinate Plane**—pp. 236–243	
	Lesson 28 **Dilate Figures on the Coordinate Plane**—pp. 244–251	

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 10 Geometric Measures and Coordinate Geometry

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
10-9 **Coordinate Plane: Rotations**—TE pp. 282–283B; SB pp. 282–283 / PB pp. 317–318	**Lesson 25** **Understand and Identify Congruent Figures**—pp. 220–227	8.G.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
	Lesson 26 **Reflect and Translate Figures on the Coordinate Plane**—pp. 228–235	8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
	Lesson 27 **Rotate Figures on the Coordinate Plane**—pp. 236–243	
	Lesson 28 **Dilate Figures on the Coordinate Plane**—pp. 244–251	
***10-9 A** **Properties of Rigid Transformations**—Online	**Lesson 23** **Verify Properties of Reflections and Translations**—pp. 204–211	8.G.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 Angles are taken to angles of the same measure.
		8.G.1c Parallel lines are taken to parallel lines.
10-10 **Coordinate Plane: Dilations**—TE pp. 284–285B; SB pp. 284–285 / PB pp. 319–320	**Lesson 26** **Reflect and Translate Figures on the Coordinate Plane**—pp. 228–235	8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
	Lesson 27 **Rotate Figures on the Coordinate Plane**—pp. 236–243	
	Lesson 28 **Dilate Figures on the Coordinate Plane**—pp. 244–251	
	Lesson 29 **Identify Similar Figures**—pp. 252–259	8.G.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 10 Geometric Measures and Coordinate Geometry

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
10-11 **Combine Transformations**—TE pp. 286–287B; SB pp. 286–287 / PB pp. 321–322	**Lesson 25** **Understand and Identify Congruent Figures**—pp. 220–227	8.G.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
	Lesson 29 **Identify Similar Figures**—pp. 252–259	8.G.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
***10-11 A** **Transformations and Congruence**—Online	**Lesson 25** **Understand and Identify Congruent Figures**—pp. 220–227	8.G.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
***10-11 B** **Transformations and Similarity**—Online	**Lesson 29** **Identify Similar Figures**—pp. 252–259	8.G.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
10-12 **Problem-Solving Strategy: Work Backward**—TE pp. 288–289B; SB pp. 288–289 / PB pp. 323–324	**Lesson 13** **Solve Linear Equations**—pp. 112–119	8.EE.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 11 Patterns and Nonlinear Functions

Foundations of Algebra, Grade 8		Common Core Progress Mathematics, Grade 8		Common Core State Standards for Mathematics, Grade 8	
11-1	**Extend and Create Patterns**—TE pp. 294–295B; SB pp. 294–295 / PB pp. 333–334				
11-2	**Arithmetic Patterns and Tables**—TE pp. 296–297B; SB pp. 296–297 / PB pp. 335–336				
11-3	**Geometric Patterns and Tables**—TE pp. 298–299B; SB pp. 298–299 / PB pp. 337–338				
11-4	**Relationships and Graphs**—TE pp. 300–301B; SB pp. 300–301 / PB pp. 339–340				
***11-4A**	**Sketch Graphs**—Online	**Lesson 22**	**Analyze Graphs of Functions**—pp. 190–197	8.F.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.
11-5	**Find Function Values**—TE pp. 302–303B; SB pp. 302–303 / PB pp. 341–342				
11-6	**Nonlinear Functions: Quadratic**—TE pp. 304–305B; SB pp. 304–305 / PB pp. 343–344	**Lesson 19**	**Investigate Linear and Non-Linear Functions**—pp. 166–173	8.F.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 $A = s2$ 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.*
11-7	**Other Nonlinear Functions**—TE pp. 306–307B; SB pp. 306–307 / PB pp. 345–346				
11-8	**Inverse Variation**—TE pp. 308–309B; SB pp. 308–309 / PB pp. 347–348				
11-9	**Technology: Graphs of Nonlinear Functions**—TE pp. 310–311B; SB pp. 310–311 / PB pp. 349–350	**Lesson 19**	**Investigate Linear and Non-Linear Functions**—pp. 166–173	8.F.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.*

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 11 Patterns and Nonlinear Functions

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8	
11-10 **Problem-Solving Strategy: Account for All Possibilities**—TE pp. 312–313B; SB pp. 312–313 / PB pp. 351–352	**Lesson 14** **Solve Systems of Equations**—pp. 120–127	8.EE.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.*
	Lesson 15 **Problem-Solving: Systems of Equations**—pp. 128–135	8.EE.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.*
	Lesson 40 **Analyze Data in Two-Way Tables**—pp. 346–353	8.SP.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. *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?*

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 12 Three-Dimensional Geometry

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
12-1 **Polyhedrons and Other Three-Dimensional Figures**—TE pp. 318–319B; SB pp. 318–319 / PB pp. 361–362		
12-2 **Draw Views of Three-Dimensional Figures**—TE pp. 320–321B; SB pp. 320–321 / PB pp. 363–364		
12-3 **Surface Area of Prisms and Cylinders**—TE pp. 322–323B; SB pp. 322–323 / PB pp. 365–366		
12-4 **Surface Area of Pyramids and Cones**—TE pp. 324–325B; SB pp. 324–325 / PB pp. 367–368		
12-5 **Volume of Prisms and Cylinders**—TE pp. 326–327B; SB pp. 326–327 / PB pp. 369–370	**Lesson 36** **Learn and Apply Volume Formulas**—pp. 308–315	8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
***12-5A** **Perfect Cubes and Cube Roots**—Online ***12-5B** **Use Cube Root Symbols**—Online	**Lesson 6** **Evaluate Square Roots and Cube Roots**—pp. 56–63 **Lesson 7** **Solve Simple Equations Involving Squares and Cubes**—pp. 64–71	8.EE.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
12-6 **Volume of Pyramids and Cones**—TE pp. 328–329B; SB pp. 328–329 / PB pp. 371–372	**Lesson 36** **Learn and Apply Volume Formulas**—pp. 308–315	8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
***12-6A** **Compute Missing Dimensions of Three-Dimensional Figures**—Online	**Lesson 34** **Problem Solving: The Pythagorean Theorem**—pp. 292–299	8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
12-7 **Volume of Spheres**—TE pp. 330–331B; SB pp. 330–331 / PB pp. 373–374	**Lesson 36** **Learn and Apply Volume Formulas**—pp. 308–315	8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 12 Three-Dimensional Geometry

Foundations of Algebra, Grade 8		Common Core Progress Mathematics, Grade 8		Common Core State Standards for Mathematics, Grade 8	
12-8	**Similar Three-Dimensional Figures**—TE pp. 332–333B; SB pp. 332–333 / PB pp. 375–376				
12-9	**Effect of Changing Dimensions**—TE pp. 334–335B; SB pp. 334–335 / PB pp. 377–378				
12-10	**Explore Properties of Three-Dimensional Figures**—TE pp. 336–337B; SB pp. 336–337 / PB pp. 379–380				
12-11	**Problem-Solving Strategy: Review of Strategies**—TE pp. 338–339B; SB pp. 338–339 / PB pp. 381–382	**Lesson 13**	**Solve Linear Equations**—pp. 112–119	8.EE.7b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
		Lesson 22	**Analyze Graphs of Functions**—pp. 190–197	8.F.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.

Chapter 13 Data Analysis and Statistics

Foundations of Algebra, Grade 8		Common Core Progress Mathematics, Grade 8		Common Core State Standards for Mathematics, Grade 8	
13-1	**Collect and Organize Data**—TE pp. 344–345B; SB pp. 344–345 / PB pp. 391–392				
13-2	**Surveys and Samples**—TE pp. 346–347B; SB pp. 346–347 / PB pp. 393–394				
13-3	**Stem-and-Leaf Plots**—TE pp. 348–349B; SB pp. 348–349 / PB pp. 395–396				
13-4	**Box-and-Whisker Plots**—TE pp. 350–351B; SB pp. 350–351 / PB pp. 397–398				
13-5	**Multiple Bar Graphs**—TE pp. 352–353B; SB pp. 352–353 / PB pp. 399–400				

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 13 Data Analysis and Statistics

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
***13-5A** **Patterns of Association in Categorical Data**—Online	**Lesson 40** **Analyze Data in Two-Way Tables**—pp. 346–353	8.SP.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. *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?*
***13-5B** **Examine Patterns of Association**—Online		
13-6 **Bar Graph Applications**—TE pp. 354–355B; SB pp. 354–355 / PB pp. 401–402		
13-7 **Histograms**—TE pp. 356–357B; SB pp. 356–357 / PB pp. 403–404		
13-8 **Multiple Line Graphs**—TE pp. 358–359B; SB pp. 358–359 / PB pp. 405–406		
13-9 **Choose Appropriate Graphs**—TE pp. 360–361B; SB pp. 360–361 / PB pp. 407–408		
13-10 **Misleading Graphs and Statistics**—TE pp. 362–363B; SB pp. 362–363 / PB pp. 409–410		
13-11 **Technology: Box-and-Whisker Plots and Histograms**—TE pp. 364–365B; SB pp. 364–365 / PB pp. 411–412		

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 13 Data Analysis and Statistics

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
13-12 **Problem-Solving Strategy: Consider Extreme Cases**—TE pp. 366–367B; SB pp. 366–367 / PB pp. 413–414	**Lesson 30** **Establish Facts about Parallel Lines and Angles**—pp. 260–265	8.G.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *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.*
	Lesson 31 **Establish Facts about Triangles and Angles**—pp. 266–275	
	Lesson 36 **Learn and Apply Volume Formulas**—pp. 308–315	8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Chapter 14 Probability and Logic

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
14-1 **Counting Principle and Tree Diagrams**—TE pp. 372–373B; SB pp. 372–373 / PB pp. 423–424		
14-2 **Theoretical Probability**—TE pp. 374–375B; SB pp. 374–375 / PB pp. 425–426		
14-3 **Experimental Probability**—TE pp. 376–377B; SB pp. 376–377 / PB pp. 427–428		
14-4 **Probability and Odds**—TE pp. 378–379B; SB pp. 378–379 / PB pp. 429–430		
14-5 **Mutually Exclusive Events**—TE pp. 380–381B; SB pp. 380–381 / PB pp. 431–432		
14-6 **Compound Events**—TE pp. 382–383B; SB pp. 382–383 / PB pp. 433–434		
14-7 **Pascal's Triangle and Probability**—TE pp. 384–385B; SB pp. 384–385 / PB pp. 435–436		
14-8 **Permutations**—TE pp. 386–387B; SB pp. 386–387 / PB pp. 437–438		

Copyright © William H. Sadlier, Inc. All rights reserved.

Chapter 14 Probability and Logic

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
14-9 **Combinations**—TE pp. 388–389B; SB pp. 388–389 / PB pp. 439–440		
14-10 **Connectives**—TE pp. 390–391B; SB pp. 390–391 / PB pp. 441–442		
14-11 **Converse, Inverse, and Contrapositive**—TE pp. 392–393B; SB pp. 392–393 / PB pp. 443–444		
14-12 **Inductive and Deductive Reasoning**—TE pp. 394–395B; SB pp. 394–395 / PB pp. 445–446		
14-13 **Conjectures and Counterexamples**—TE pp. 396–397B; SB pp. 396–397 / PB pp. 447–448		
14-14 **Problem Solving: Review of Strategies**—TE pp. 398–399B; SB pp. 398–399 / PB pp. 449–450		

Skills Update

Foundations of Algebra, Grade 8	Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
SU **I. Place Value (with Powers of 10)**—p. SB p. 403		
SU **II. Compare and Order Numbers (Decimals)**—p. SB p. 403		
SU **III. Estimation: Rounding and Compatible Numbers**—p. SB p. 404		
SU **IV. Properties of Addition and Multiplication: Commutative Property**—p. SB p. 404		
SU **V. Properties of Addition and Multiplication: Associate Property**—p. SB p. 404		
SU **IV. Properties of Addition and Multiplication: Identity Property**—p. SB p. 404		
SU **IV. Properties of Addition and Multiplication: Zero Property of Multiplication**—p. SB p. 405		

Copyright © William H. Sadlier, Inc. All rights reserved.

Skills Update

Foundations of Algebra, Grade 8		Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
SU	**IV. Properties of Addition and Multiplication: Distributive Property of Multiplication Over Addition**—p. SB p. 405		
SU	**V. Order of Operations with Integers**—p. SB p. 405		
SU	**VI. Divisibility Rules**—p. SB p. 406		
SU	**VII. Prime and Composite Numbers**—p. SB p. 406		
SU	**VIII. Multiply Decimals**—p. SB p. 407		
SU	**IX. Divide Decimals**—p. SB p. 407		
SU	**X. Zeros in a Product or Quotient**—p. SB p. 408		
SU	**XI. Mixed Numbers and Fractions**—p. SB p. 408		
SU	**XII. Add and Subtract Fractions**—p. SB p. 409		
SU	**XIII. Multiply and Divide Fractions**—p. SB p. 409–410		
SU	**XIV. Metric System of Measurements**—p. SB p. 410–411		
SU	**XV. Customary System of Measurements**—p. SB p. 411		
SU	**XVI. Basic Geometric Terms**—p. SB p. 411–412		
SU	**XVII. Classify and Measure Angles**—p. SB p. 412		
SU	**XVIII. Classify Triangles and Quadrilaterals**—p. SB p. 413		
SU	**XIX. Perimeter and Area of Rectangles**—p. SB p. 413–414		
SU	**XX. The Coordinate Plane**—p. SB p. 414		

Copyright © William H. Sadlier, Inc. All rights reserved.

Skills Update

Foundations of Algebra, Grade 8		Common Core Progress Mathematics, Grade 8	Common Core State Standards for Mathematics, Grade 8
SU	**XXI. Double Line and Double Bar Graphs**—p. SB p. 415		
SU	**XXII. Probability of an Event**—p. SB p. 416		

Copyright © William H. Sadlier, Inc. All rights reserved.