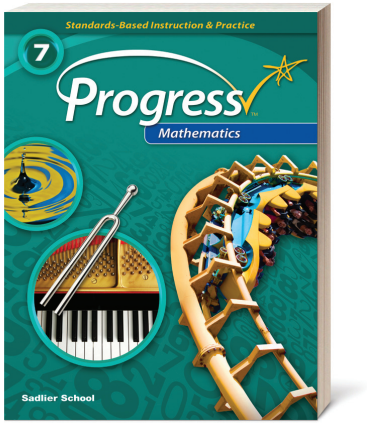
SADLIER

Progress Mathematics

Standards-Based Instruction & Practice



Aligned to the

South Carolina College- and Career-Ready Standards for Mathematics

Grade 7

Contents

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The Number System

Standards		Sadlier *Progress Mathematics*, Grade 7	
The student will:			
7.NS.1	Extend prior knowledge of operations with positive rational numbers to add and to subtract all rational numbers and represent the sum or difference on a number line.		
	a. Understand that the additive inverse of a number is its opposite and their sum is equal to zero.	**Lesson 8**	**Understand Addition of Integers**—pp. 72–79
	b. Understand that the sum of two rational numbers (p + q) represents a distance from p on the number line equal to |q| where the direction is indicated by the sign of q.	**Lesson 8**	**Understand Addition of Integers**—pp. 72–79
	c. Translate between the subtraction of rational numbers and addition using the additive inverse, p – q = p + (-q).	**Lesson 9**	**Understand Subtraction of Integers**—pp. 80–87
	d. Demonstrate that the distance between two rational numbers on the number line is the absolute value of their difference.	**Lesson 9**	**Understand Subtraction of Integers**—pp. 80–87
	e. Apply mathematical properties (e.g., commutative, associative, distributive, or the properties of identity and inverse elements) to add and subtract rational numbers.	**Lesson 10**	**Add and Subtract Rational Numbers**—pp. 88–95
7.NS.2	Extend prior knowledge of operations with positive rational numbers to multiply and to divide all rational numbers.		
	a. Understand that the multiplicative inverse of a number is its reciprocal and their product is equal to one.	**Lesson 11**	**Understand Multiplication of Integers**—pp. 96–103
	b. Understand sign rules for multiplying rational numbers.	**Lesson 11**	**Understand Multiplication of Integers**—pp. 96–103
	c. Understand sign rules for dividing rational numbers and that a quotient of integers (with a non-zero divisor) is a rational number.	**Lesson 12**	**Understand Division of Integers**—pp. 104–111
	d. Apply mathematical properties (e.g., commutative, associative, distributive, or the properties of identity and inverse elements) to multiply and divide rational numbers.	**Lesson 13**	**Multiply and Divide Rational Numbers**—pp. 112–119
	e. Understand that some rational numbers can be written as integers and all rational numbers can be written as fractions or decimal numbers that terminate or repeat.	**Lesson 14**	**Convert Rational Numbers to Decimal Form**—pp. 120–127

The Number System

Standards		Sadlier *Progress Mathematics*, Grade 7	
7.NS.3	Apply the concepts of all four operations with rational numbers to solve real-world and mathematical problems.	**Lesson 15**	**Apply Rational-Number Operations**—pp. 128–135
7.NS.4	Understand and apply the concepts of comparing and ordering to rational numbers.		
	a. Interpret statements using less than (<), greater than (>), less than or equal to (≤), greater than or equal to (≥), and equal to (=) as relative locations on the number line.		**See* Grade 6: Lesson 17, Compare and Order Rational Numbers—pp. 144–151
	b. Use concepts of equality and inequality to write and explain real-world and mathematical situations.		**See* Grade 6: Lesson 25, Identify Solutions to Equations and Inequalities—pp. 214–221
7.NS.5	Extend prior knowledge to translate among multiple representations of rational numbers (fractions, decimal numbers, percentages). Exclude the conversion of repeating decimal numbers to fractions.	**Lesson 10**	**Add and Subtract Rational Numbers** (convert fractions to decimals)—pp. 88–95
		Lesson 14	**Convert Rational Numbers to Decimal Form**—pp. 120–127
			Related content— **See* Grade 6: Lesson 15, Understand Positive and Negative Numbers and Opposites—pp. 128–135; Lesson 16, Locate Points with Rational Coordinates—pp. 136–143

Ratios and Proportional Relationships

Standards		Sadlier *Progress Mathematics*, Grade 7	
The student will:			
7.RP.1	Compute unit rates, including those involving complex fractions, with like or different units.	**Lesson 1**	**Compute Unit Rates**—pp. 10–17
7.RP.2	Identify and model proportional relationships given multiple representations, including tables, graphs, equations, diagrams, verbal descriptions, and real-world situations.		
	a. Determine when two quantities are in a proportional relationship.	**Lesson 2**	**Identify Proportional Relationships**—pp. 18–25
	b. Recognize or compute the constant of proportionality.	**Lesson 3**	**Identify the Constant of Proportionality**—pp. 26–33
	c. Understand that the constant of proportionality is the unit rate.	**Lesson 3**	**Identify the Constant of Proportionality**—pp. 26–33

Ratios and Proportional Relationships

Standards		Sadlier *Progress Mathematics*, Grade 7	
	d. Use equations to model proportional relationships.	**Lesson 4**	**Represent Proportional Relationships with Equations** —pp. 34–41
	e. Investigate the graph of a proportional relationship and explain the meaning of specific points (e.g., origin, unit rate) in the context of the situation.	**Lesson 5**	**Interpret Graphs of Proportional Relationships**—pp. 42–49
7.RP.3	Solve real-world and mathematical problems involving ratios and percentages using proportional reasoning (e.g., multi-step dimensional analysis, percent increase/decrease, tax).	**Lesson 6**	**Problem Solving: Multi-step Ratio Problems**—pp. 50–57
		Lesson 7	**Problem Solving: Multi-step Percent Problems**—pp. 58–65

Expressions, Equations, and Inequalities

Standards		Sadlier *Progress Mathematics*, Grade 7	
The student will:			
7.EEI.1	Apply mathematical properties (e.g., commutative, associative, distributive) to simplify and to factor linear algebraic expressions with rational coefficients.	**Lesson 16**	**Combine Like Terms to Simplify Linear Expressions** —pp. 142–149
		Lesson 17	**Expand and Factor Linear Expressions**—pp. 150–157
7.EEI.2	Recognize that algebraic expressions may have a variety of equivalent forms and determine an appropriate form for a given real-world situation.	**Lesson 16**	**Combine Like Terms to Simplify Linear Expressions** —pp. 142–149
		Lesson 17	**Expand and Factor Linear Expressions**—pp. 150–157
7.EEI.3	Extend previous understanding of Order of Operations to solve multi-step real-world and mathematical problems involving rational numbers. Include fraction bars as a grouping symbol.	**Lesson 18**	**Problem Solving: Multi-step Problems with Rational Numbers**—pp. 158–165
7.EEI.4	Apply the concepts of linear equations and inequalities in one variable to real-world and mathematical situations.		
	a. Write and fluently solve linear equations of the form $ax + b = c$ and $a(x + b) = c$ where a, b, and c are rational numbers.	**Lesson 19**	**Solve Linear Equations**—pp. 166–173
		Lesson 20	**Problem Solving: Linear Equations**—pp. 174–181
	b. Write and solve multi-step linear equations that include the use of the distributive property and combining like terms. Exclude equations that contain variables on both sides.	**Lesson 16**	**Combine Like Terms to Simplify Linear Expressions** —pp. 142–149
		Lesson 20	**Problem Solving: Linear Equations**—pp. 174–181

Expressions, Equations, and Inequalities

Standards		Sadlier *Progress Mathematics*, Grade 7	
	c. Write and solve two-step linear inequalities. Graph the solution set on a number line and interpret its meaning.	**Lesson 21**	**Solve Linear Inequalities**—pp. 182–189
		Lesson 22	**Problem Solving: Linear Inequalities**—pp. 190–197
	d. Identify and justify the steps for solving multi-step linear equations and two-step linear inequalities.	**Lesson 19**	**Solve Linear Equations**—pp. 166–173
		Lesson 20	**Problem Solving: Linear Equations**—pp. 174–181
		Lesson 21	**Solve Linear Inequalities**—pp. 182–189
		Lesson 22	**Problem Solving: Linear Inequalities**—pp. 190–197
7.EEI.5	Understand and apply the laws of exponents (i.e., product rule, quotient rule, power to a power, product to a power, quotient to a power, zero power property) to simplify numerical expressions that include whole-number exponents.	**Lesson 21**	**Solve Linear Inequalities**—pp. 182–189
		Lesson 22	**Problem Solving: Linear Inequalities**—pp. 190–197

Geometry and Measurement

Standards		Sadlier *Progress Mathematics*, Grade 7	
The student will:			
7.GM.1	Determine the scale factor and translate between scale models and actual measurements (e.g., lengths, area) of real-world objects and geometric figures using proportional reasoning.	**Lesson 23**	**Use Scale Drawings to Solve Problems**—pp. 204–211
7.GM.2	Construct triangles and special quadrilaterals using a variety of tools (e.g., freehand, ruler and protractor, technology).		
	a. Construct triangles given all measurements of either angles or sides.	**Lesson 24**	**Draw Shapes that Meet Given Conditions**—pp. 212–219
		Lesson 25	**Construct Triangles Using Both Side Lengths and Angle Measures**—pp. 220–227
	b. Decide if the measurements determine a unique triangle, more than one triangle, or no triangle.	**Lesson 24**	**Draw Shapes that Meet Given Conditions**—pp. 212–219
		Lesson 25	**Construct Triangles Using Both Side Lengths and Angle Measures**—pp. 220–227

Geometry and Measurement

Standards		Sadlier *Progress Mathematics*, Grade 7	
	c. Construct special quadrilaterals (i.e., kite, trapezoid, isosceles trapezoid, rhombus, parallelogram, rectangle) given specific parameters about angles or sides.	**Lesson 24**	**Draw Shapes that Meet Given Conditions**—pp. 212–219
7.GM.3	Describe two-dimensional cross-sections of three-dimensional figures, specifically right rectangular prisms and right rectangular pyramids.	**Lesson 26**	**Slice Three-Dimensional Figures**—pp. 228–235
7.GM.4	Investigate the concept of circles.		
	a. Demonstrate an understanding of the proportional relationships between diameter, radius, and circumference of a circle.	**Lesson 27**	**Use Formulas for Area and Circumference of Circles**—pp. 236–243
	b. Understand that the constant of proportionality between the circumference and diameter is equivalent to π.	**Lesson 27**	**Use Formulas for Area and Circumference of Circles**—pp. 236–243
	c. Explore the relationship between circumference and area using a visual model.	**Lesson 27**	**Use Formulas for Area and Circumference of Circles**—pp. 236–243
	d. Use the formulas for circumference and area of circles appropriately to solve real-world and mathematical problems.	**Lesson 27**	**Use Formulas for Area and Circumference of Circles**—pp. 236–243
7.GM.5	Write equations to solve problems involving the relationships between angles formed by two intersecting lines, including supplementary, complementary, vertical, and adjacent.	**Lesson 28**	**Use Equations to Find Unknown Angle Measures**—pp. 244–251
7.GM.6	Apply the concepts of two- and three-dimensional figures to real-world and mathematical situations.		
	a. Understand that the concept of area is applied to two-dimensional figures such as triangles, quadrilaterals, and polygons.	**Lesson 29**	**Problem Solving: Area, Volume, and Surface Area**—pp. 252–259
	b. Understand that the concepts of volume and surface area are applied to three-dimensional figures such as cubes, right rectangular prisms, and right triangular prisms.	**Lesson 29**	**Problem Solving: Area, Volume, and Surface Area**—pp. 252–259
	c. Decompose cubes, right rectangular prisms, and right triangular prisms into rectangles and triangles to derive the formulas for volume and surface area.	**Lesson 29**	**Problem Solving: Area, Volume, and Surface Area**—pp. 252–259
			Foundational Skills Handbook **K. Understand:** Finding volumes of rectangular prisms—p. 374
	d. Use the formulas for area, volume, and surface area appropriately.	**Lesson 29**	**Problem Solving: Area, Volume, and Surface Area**—pp. 252–259

Data Analysis, Statistics, and Probability

Standards		Sadlier *Progress Mathematics*, Grade 7
The student will:		
7.DSP.1	Investigate concepts of random sampling.	
	a. Understand that a sample is a subset of a population and both possess the same characteristics.	**Lesson 30** **Understand Sampling**—pp. 266–273
	b. Differentiate between random and non-random sampling.	**Lesson 30** **Understand Sampling**—pp. 266–273
	c. Understand that generalizations from a sample are valid only if the sample is representative of the population.	**Lesson 30** **Understand Sampling**—pp. 266–273
	d. Understand that random sampling is used to gather a representative sample and supports valid inferences about the population.	**Lesson 30** **Understand Sampling**—pp. 266–273
7.DSP.2	Draw inferences about a population by collecting multiple random samples of the same size to investigate variability in estimates of the characteristic of interest.	**Lesson 31** **Use Sampling to Draw Inferences**—pp. 274–281
7.DSP.3	Visually compare the centers, spreads, and overlap of two displays of data (i.e., dot plots, histograms, box plots) that are graphed on the same scale and draw inferences about this data.	**Lesson 32** **Use Visual Overlap to Compare Distributions**—pp. 282–289
7.DSP.4	Compare the numerical measures of center (mean, median, mode) and variability (range, interquartile range, mean absolute deviation) from two random samples to draw inferences about the populations.	**Lesson 33** **Use Sample Statistics to Compare Populations**—pp. 290–297
7.DSP.5	Investigate the concept of probability of chance events.	
	a. Determine probabilities of simple events.	**Lesson 34** **Understand Probability of a Chance Event**—pp. 298–305
	b. Understand that probability measures likelihood of a chance event occurring.	**Lesson 34** **Understand Probability of a Chance Event**—pp. 298–305
	c. Understand that the probability of a chance event is a number between 0 and 1.	**Lesson 34** **Understand Probability of a Chance Event**—pp. 298–305
	d. Understand that a probability closer to 1 indicates a likely chance event.	**Lesson 34** **Understand Probability of a Chance Event**—pp. 298–305
	e. Understand that a probability close to 1 / 2 indicates that a chance event is neither likely nor unlikely.	**Lesson 34** **Understand Probability of a Chance Event**—pp. 298–305

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Standards		Sadlier *Progress Mathematics*, Grade 7	
	f. Understand that a probability closer to 0 indicates an unlikely chance event.	**Lesson 34**	**Understand Probability of a Chance Event**—pp. 298–305
7.DSP.6	Investigate the relationship between theoretical and experimental probabilities for simple events.		
	a. Determine approximate outcomes using theoretical probability.	**Lesson 35**	**Relate Relative Frequency and Probability**—pp. 306–313
	b. Perform experiments that model theoretical probability.	**Lesson 35**	**Relate Relative Frequency and Probability**—pp. 306–313
	c. Compare theoretical and experimental probabilities.	**Lesson 35**	**Relate Relative Frequency and Probability**—pp. 306–313
7.DSP.7	Apply the concepts of theoretical and experimental probabilities for simple events.		
	a. Differentiate between uniform and non-uniform probability models (distributions).	**Lesson 36**	**Finding Theoretical Probability**—pp. 314–321
		Lesson 37	**Finding Experimental Probability**—pp. 322–329
	b. Develop both uniform and non-uniform probability models.	**Lesson 36**	**Finding Theoretical Probability**—pp. 314–321
		Lesson 37	**Finding Experimental Probability**—pp. 322–329
	c. Perform experiments to test the validity of probability models.	**Lesson 37**	**Use a Chance Process to Develop a Probability Model**—pp. 322–329
4.MDA.8	Extend the concepts of simple events to investigate compound events.		
	a. Understand that the probability of a compound event is between 0 and 1.	**Lesson 38**	**Find Probabilities of Compound Events**—pp. 330–337
	b. Identify the outcomes in a sample space using organized lists, tables, and tree diagrams.	**Lesson 39**	**Represent Sample Spaces for Compound Events**—pp. 338–345
	c. Determine probabilities of compound events using organized lists, tables, and tree diagrams.	**Lesson 39**	**Represent Sample Spaces for Compound Events**—pp. 338–345
	d. Design and use simulations to collect data and determine probabilities.	**Lesson 40**	**Simulate Compound Events**—pp. 346–353
	e. f.		

Data Analysis, Statistics, and Probability

Standards	Sadlier *Progress Mathematics*, Grade 7	
g. Compare theoretical and experimental probabilities for compound events.	**Lesson 36**	**Finding Theoretical Probability**—pp. 314–321
	Lesson 37	**Finding Experimental Probability**—pp. 322–329
	Lesson 40	**Simulate Compound Events**—pp. 346–353