SADLIER

Fundamentals of Algebra

Aligned to the

Archdiocese of Detroit

Seventh Grade Mathematics Standards

Grade 7

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Ratios & Proportional Relationships

Archdiocese of Detroit: Seventh Grade Mathematics Standards		Sadlier *Fundamentals of Algebra*, Grade 7
Analyze proportional relationships and use them to solve real-world and mathematical problems.		
7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.*	**6-2 Unit Rate and Unit Cost**—TE pp. 150–151B; SB pp. 150–151 / PB pp. 169–170 Objective(s): To write rates. To find unit rates. To use unit cost to determine the better or best buy. To compare rates. ***6-3A Use Unit Rates**—Online Objective(s): To compute unit rates associated with ratios of fractions. To compute unit rates measured in like or different units. To use models to compute unit rates. **6-10 Dimensional Analysis**—TE pp. 166–167B; SB pp. 166–167 / PB pp. 185–186 Objective(s): To apply dimensional analysis. To use unit ratios to convert currency, time, and Customary Units of length, capacity, and weight.
7.RP.A.2	Convert ratio quantities between different systems of units, such as feet per second to miles per hour.	**6-2 Unit Rate and Unit Cost**—TE pp. 150–151B; SB pp. 150–151 / PB pp. 169–170 Objective(s): To write rates. To find unit rates. To use unit cost to determine the better or best buy. To compare rates. ***6-3A Use Unit Rates**—Online Objective(s): To compute unit rates associated with ratios of fractions. To compute unit rates measured in like or different units. To use models to compute unit rates.
7.RP.A.3	Solve proportion problems using such methods as unit rate, scaling, finding equivalent fractions, cross products, and solving the proportion equation $a/b = c/d$; know how to see patterns about proportional situations in tables.	**5-2 Greatest Common Factor**—TE pp. 110–111B; SB pp. 110–111 / PB pp. 125–126 Objective(s): To form equivalent fractions. **6-2 Unit Rate and Unit Cost**—TE pp. 150–151B; SB pp. 150–151 / PB pp. 169–170 Objective(s): To write rates. To find unit rates. To use unit cost to determine the better or best buy. To compare rates. **6-3 Write and Solve Proportions**—TE pp. 152–153B; SB pp. 152–153 / PB pp. 171–172 Objective(s): To write proportions. To use the cross-products rule to determine whether ratios form a proportion. To find the missing term in a proportion. ***6-3A Use Unit Rates**—Online Objective(s): To compute unit rates associated with ratios of fractions. To compute unit rates measured in like or different units. To use models to compute unit rates. **6-5 Proportion by Parts**—TE pp. 156–157B; SB pp. 156–157 / PB pp. 175–176 Objective(s): To model solutions of proportions. To solve proportions using part-to whole ratios.

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		6-6 Scale Drawings and Models—TE pp. 158–159B; SB pp. 158–159 / PB pp. 177–178 Objective(s): To use proportions to solve scale-drawing problems. To use proportions to solve scale-model problems. To use a map scale. To use a scale factor to make a scale model. ***6-6B Proportional Relationships and Equations**—Online Objective(s): To represent proportional relationships by equations. To interpret the situational meaning of point on the graph of a proportional relationship. **6-4 Direct Proportion**—TE pp. 154–155B; SB pp. 154–155 / PB pp. 173–174 Objective(s): To apply the concept of direction proportions.
7.RP.A.4	Calculate rates of change including speed.	***6-3A Use Unit Rates**—Online Objective(s): To compute unit rates associated with ratios of fractions. To compute unit rates measured in like or different units. To use models to compute unit rates. **13-7 Slope** (rate of change)—TE pp. 364–365B; SB pp. 364–365 / PB pp. 411–412 Objective(s): To find the slope of a line. To identify the four kinds of slope.
7.RP.A.5	Recognize and represent proportional relationships between quantities.	
7.RP.A.5a	Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.	**6-3 Write and Solve Proportions**—TE pp. 152–153B; SB pp. 152–153 / PB pp. 171–172 Objective(s): To write proportions. To use the cross-products rule to determine whether ratios form a proportion. To find the missing term in a proportion. **6-4 Direct Proportion** (graph)—TE pp. 154–155B; SB pp. 154–155 / PB pp. 173–174 Objective(s): To apply the concept of direction proportions.
7.RP.A.5b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	***6-3B Use Rational Numbers to Solve Problems—Online** Objective(s): To test proportionality by using table of equivalent ratios or checking that a graph of the relationship is a straight line going through the origin. ***6-6A Identify Unit Rate—Online** Objective(s): To identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. **13-2 Algebraic Patterns and Sequences**—TE pp. 354–355B; SB pp. 354–355 / PB pp. 401–402 Objective(s): To recognize, describe, and extend patterns with more than one constant. To recognize, describe, and extend number patterns. To recognize patterns related to iterations. **13-7 Slope**—TE pp. 364–365B; SB pp. 364–365 / PB pp. 411–412 Objective(s): To find the slope of a line. To identify the four kinds of slope.

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		***13-8A Identify Constant of Proportionality**—Online Objective(s): To identify the constant of proportionality (unit rate) in real-world (quadrant I) graphs. To relate unit rate and steepness and understand what unit rate means in relation to its visual appearance in a graph.
7.RP.A.5c	Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.*	**6-4 Direct Proportion**—TE pp. 154–155B; SB pp. 154–155 / PB pp. 173–174 Objective(s): To apply the concept of direction proportions. **6-5 Proportion by Parts**—TE pp. 156–157B; SB pp. 156–157 / PB pp. 175–176 Objective(s): To model solutions of proportions. To solve proportions using part-to whole ratios. **6-6 Scale Drawings and Models**—TE pp. 158–159B; SB pp. 158–159 / PB pp. 177–178 Objective(s): To use proportions to solve scale-drawing problems. To use proportions to solve scale-model problems. To use a map scale. To use a scale factor to make a scale model. ***6-6B Proportional Relationships and Equations**—Online Objective(s): To represent proportional relationships by equations. To interpret the situational meaning of point on the graph of a proportional relationship. ***6-6C Use Proportional Relationships and Equations to Solve Problems**—Online Objective(s): To solve problems by representing proportional relationships by equations. To interpret the situational meaning of point on the graph of a proportional relationship. **7-4 Find a Percentage of a Number**—TE pp. 180–181B; SB pp. 180–181 / PB pp. 203–204 Objective(s): To use the percent formula to find a percentage of a number. To use a percent proportion to find a percentage of a number. **11-11 Changing Dimensions of Three-Dimensional Figures**—TE pp. 322–323B; SB pp. 322–323 / PB pp. 361–362 Objective(s): To explore how change of scale relates to change in dimensions. To explore how changes in scale and dimension relate to changes in volume and surface area. ***13-8B Graph Proportional Relationships**—Online Objective(s): To represent proportional relationships by equations and graphs on the coordinate plane in all four quadrants. To interpret the situational meaning of point on the graph of a proportional relationship.
7.RP.A.5d	Explain what a point (*x*, *y*) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, *r*) where *r* is the unit rate.	**6-4 Direct Proportion**—TE pp. 154–155B; SB pp. 154–155 / PB pp. 173–174 Objective(s): To apply the concept of direction proportions. ***6-6B Proportional Relationships and Equations**—Online Objective(s): To represent proportional relationships by equations. To interpret the situational meaning of point on the graph of a proportional relationship.

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		***6-6C Use Proportional Relationships and Equations to Solve Problems**—Online Objective(s): To solve problems by representing proportional relationships by equations. To interpret the situational meaning of point on the graph of a proportional relationship. ***13-8B Graph Proportional Relationships**—Online Objective(s): To represent proportional relationships by equations and graphs on the coordinate plane in all four quadrants. To interpret the situational meaning of point on the graph of a proportional relationship.
7.RP.A.6	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	**6-7 Similarity**—TE pp. 160–161B; SB pp. 160–161 / PB pp. 179–180 Objective(s): To determine similarity. To name corresponding parts of similar figures. To use proportions to find missing dimensions. **6-8 Indirect Measurement**—TE pp. 162–163B; SB pp. 162–163 / PB pp. 181–182 Objective(s): To solve problems involving indirect measurement by using similar right triangles. **7-1 Percents—**TE pp. 174–175B; SB pp. 174–175 / PB pp. 197–198 Objective(s): To model percents. To write percents as equivalent ratios. To write ratios as equivalent percents. **7-2 Fractions, Decimals, Percents**—TE pp. 176–177B; SB pp. 176–177 / PB pp. 199–200 Objective(s): To write percents as fractions. To write percents as decimals. To write fractions as percents. To write decimals as percents. To compare fractions, decimals, and percents. **7-4 Find a Percentage of a Number**—TE pp. 180–181B; SB pp. 180–181 / PB pp. 203–204 Objective(s): To use the percent formula to find a percentage of a number. To use a percent proportion to find a percentage of a number. **7-5 Find a Percent**—TE pp. 182–183B; SB pp. 182–183 / PB pp. 205–206 Objective(s): To find what percent one number is of another using the percent formula or a percent proportion. **7-8 Percent Increase**—TE pp. 188–189B; SB pp. 188–189 / PB pp. 211–212 Objective(s): To find the percent increase. To find profit. To find the selling price for an item sold at a profit. **7-9 Percent Decrease**—TE pp. 190–191B; SB pp. 190–191 / PB pp. 213–214 Objective(s): To find the percent decrease. To find the selling price for an item sold at a loss. ***7-9A Percent Error**—Online Objective(s): To use proportional relationships to solve multistep percent problems involving percent error.

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	7-10 Sales Tax and Tips—TE pp. 192–193B; SB pp. 192–193 / PB pp. 215–216 Objective(s): To calculate sales tax and total cost. To read and use a tax table. To calculate a tip and total cost.
	7-11 Discount and Markup—TE pp. 194–195B; SB pp. 194–195 / PB pp. 217–218 Objective(s): To find the amount of discount. To find the sale price. To find the discount rate. To find the amount of markup. To find the markup rate.
	7-12 Commission—TE pp. 196–197B; SB pp. 196–197 / PB pp. 219–220 Objective(s): To find the amount of commission. To find the commission rate. To find the total sales. To compare commissions when the total sales and commission rates are given.
	7-13 Simple Interest—TE pp. 198–199B; SB pp. 198–199 / PB pp. 221–222 Objective(s): To find simple interest. To find the total amount earned or due. To find the rate of interest. To find the time that principal is left on deposit. To use spreadsheet software to compute simple interest for different principals, rates and lengths of time.
	7-14 Compound Interest—TE pp. 200–201B; SB pp. 200–201 / PB pp. 223–224 Objective(s): To compute compound interest using tables.
	11-11 Changing Dimensions of Three-Dimensional Figures—TE pp. 322–323B; SB pp. 322–323 / PB pp. 361–362 Objective(s): To explore how change of scale relates to change in dimensions. To explore how changes in scale and dimension relate to changes in volume and surface area.
	11-12 Problem Solving Strategy: Work Backward—TE pp. 324–325B; SB pp. 324–325 / PB pp. 363–364 Objective(s): To solve problems using the strategy *Work Backward.*

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The Number System

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Apply and extend previous understandings of operations with fractions.		
7.NS.A.1	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.	
7.NS.A.1a	Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.*	**1-1 Integers and Absolute Value**—TE pp. 2–3B; SB pp. 2–3 / PB pp. 1–2 Objective(s): To identify integers. To identify opposites. To find the absolute value of an integer. **1-2 Compare and Order Integers**—TE pp. 4–5B; SB pp. 4–5 / PB pp. 3–4 Objective(s): To compare integers with a number line. To compare integers without a number line. To order integers. **1-3 Add Integers**—TE pp. 6–7B; SB pp. 6–7 / PB pp. 5–6 Objective(s): To model addition of integers. To add integers with like signs. To add integers with unlike signs. To add more than two integers. **1-4 Subtract Integers**—TE pp. 8–9B; SB pp. 8–9 / PB pp. 7–8 Objective(s): To model subtraction of integers. To subtract integers with like signs. To subtract integers with unlike signs. ***1-4B Understanding Integers**—Online Objective(s): To interpret the meaning of the opposite of a real-life quantity.
7.NS.A.1b	Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 are additive inverses. Interpret sums of rational numbers by describing real-world contexts.	**1-1 Integers and Absolute Value**—TE pp. 2–3B; SB pp. 2–3 / PB pp. 1–2 Objective(s): To identify integers. To identify opposites. To find the absolute value of an integer. **1-3 Add Integers**—TE pp. 6–7B; SB pp. 6–7 / PB pp. 5–6 Objective(s): To model addition of integers. To add integers with like signs. To add integers with unlike signs. To add more than two integers. **1-4 Subtract Integers**—TE pp. 8–9B; SB pp. 8–9 / PB pp. 7–8 Objective(s): To model subtraction of integers. To subtract integers with like signs. To subtract integers with unlike signs. **1-7 Properties**—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14 Objective(s): To identify properties of addition. To identify properties of multiplication.

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7.NS.A.1c	Understand subtraction of rational numbers as adding the opposite, e.g. $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.	**1-4 Subtract Integers**—TE pp. 8–9B; SB pp. 8–9 / PB pp. 7–8 Objective(s): To model subtraction of integers. To subtract integers with like signs. To subtract integers with unlike signs. ***1-4A Distance on a Number Line**—Online Objective(s): To use absolute value to compute the distance between two rational numbers on the number line. To use absolute value to compute distances in real-world contexts. **1-7 Properties**—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14 Objective(s): To identify properties of addition. To identify properties of multiplication. **4-5 Add and Subtract Decimals**—TE pp. 80–81B; SB pp. 80–81 / PB pp. 91–92 Objective(s): To add positive and negative decimals. To subtract positive and negative decimals. To add more than two addends. **5-6 Add and Subtract Fractions**—TE pp. 118–119B; SB pp. 118–119 / PB pp. 133–134 Objective(s): To add and subtract positive and negative fractions. **5-7 Add and Subtract Mixed Numbers**—TE pp. 120–121B; SB pp. 120–121 / PB pp. 135–136 Objective(s): To add and subtract positive and negative mixed numbers. ***5-7A Rational Numbers on a Number Line**—Online Objective(s): To use absolute value to compute the distance between two rational numbers on the number line. To use absolute value to compute distances in real-world contexts.
7.NS.A.1d	Apply properties of operations as strategies to add and subtract rational numbers.	**1-7 Properties**—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14 Objective(s): To identify properties of addition. To identify properties of multiplication. **1-8 Closure Property**—TE pp. 16–17B; SB pp. 16–17 / PB pp. 15–16 Objective(s): To identify the closure properties for any defined set of numbers. **1-10 Order of Operations**—TE pp. 20–21B; SB pp. 20–21 / PB pp. 19–20 Objective(s): To use the order of operations to simplify numerical expressions with grouping symbols and exponents. To use the order of operations to simplify numerical expressions with grouping symbols. To use the order of operations to simplify numerical expressions with exponents. To use a calculator to check solutions. **2-4 Solve Addition Equations**—TE pp. 36–37B; SB pp. 36–37 / PB pp. 39–40 Objective(s): To apply the Subtraction Property of Equality to solve algebraic addition equations with integers. To combine numerical terms to simplify addition equations with integers. .

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		2-5 Solve Subtraction Equations—TE pp. 38–39B; SB pp. 38–39 / PB pp. 41–42 Objective(s): To apply the Addition Property of Equality to solve algebraic subtraction equations with integers. To write a related sentence to solve for the subtrahend. To combine numerical terms to simplify subtraction equations with integers. **4-5 Add and Subtract Decimals**—TE pp. 80–81B; SB pp. 80–81 / PB pp. 91–92 Objective(s): To add positive and negative decimals. To subtract positive and negative decimals. To add more than two addends. **5-6 Add and Subtract Fractions**—TE pp. 118–119B; SB pp. 118–119 / PB pp. 133–134 Objective(s): To add and subtract positive and negative fractions. **5-7 Add and Subtract Mixed Numbers**—TE pp. 120–121B; SB pp. 120–121 / PB pp. 135–136 Objective(s): To add and subtract positive and negative mixed numbers. **5-12 Properties of Rational Numbers**—TE pp. 130–131B; SB pp. 130–131 / PB pp. 145–146 Objective(s): To identify properties of addition and multiplication of rational numbers. To use the properties to compute mentally with rational numbers. **5-14 Addition and Subtraction Equations with Fractional Numbers**—TE pp. 134–135B; SB pp. 134–135 / PB pp. 149–150 Objective(s): To apply the Subtraction Property of Equality to solve addition equations with fractions. To apply the Addition Property of Equality to solve subtraction equations with fractions.
7.NS.A.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.	
7.NS.A.2a	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.	**1-5 Multiply Integers**—TE pp. 9–10B; SB pp. 10–11 / PB pp. 9–10 Objective(s): To multiply integers with models. To multiply integers without models. **1-6 Divide Integers**—TE pp. 12–13B; SB pp. 12–13 / PB pp. 11–12 Objective(s): To divide integers with models. To divide integers without models. **1-7 Properties**—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14 Objective(s): To identify properties of addition. To identify properties of multiplication. **4-5 Add and Subtract Decimals**—TE pp. 80–81B; SB pp. 80–81 / PB pp. 91–92 Objective(s): To add positive and negative decimals. To subtract positive and negative decimals. To add more than two addends. **5-8 Multiply Fractions**—TE pp. 122–123B; SB pp. 122–123 / PB pp. 137–138 Objective(s): To multiply positive and negative fractions. To multiply positive and negative fractions and integers. To evaluate algebraic expressions involving multiplication of fractions and mixed numbers.

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		5-9 Multiply Mixed Numbers—TE pp. 124–125B; SB pp. 124–125 / PB pp. 139–140 Objective(s): To estimate the product of mixed numbers. To multiply positive and negative mixed numbers. To evaluate algebraic expressions involving multiplication of fractions and mixed numbers. **5-12 Properties of Rational Numbers**—TE pp. 130–131B; SB pp. 130–131 / PB pp. 145–146 Objective(s): To identify properties of addition and multiplication of rational numbers. To use the properties to compute mentally with rational numbers. **5-13 Order of Operations with Rational Numbers**—TE pp. 132–133B; SB pp. 132–133 / PB pp. 147–148 Objective(s): To use the order of operations to simplify numerical expressions containing rational numbers. To use a calculator to check solutions. ***5-13A Use Rational Numbers to Solve Problems**—Online Objective(s): To interpret products of rational numbers by describing real-life contexts. To interpret quotients of rational numbers by describing real-life contexts.
7.NS.A.2b	Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.	**1-6 Divide Integers**—TE pp. 12–13B; SB pp. 12–13 / PB pp. 11–12 Objective(s): To divide integers with models. To divide integers without models. **1-7 Properties**—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14 Objective(s): To identify properties of addition. To identify properties of multiplication. **1-8 Closure Property**—TE pp. 16–17B; SB pp. 16–17 / PB pp. 15–16 Objective(s): To identify the closure properties for any defined set of numbers. **4-1 Rational Numbers**—TE pp. 72–73B; SB pp. 72–73 / PB pp. 83–84 Objective(s): To identify rational numbers. To identify rational numbers as terminating or nonterminating repeating decimals. To locate rational numbers on a number line. **4-2 Equivalent Rational Numbers**—TE pp. 74–75B; SB pp. 74–75 / PB pp. 85–86 Objective(s): To write rational numbers in equivalent forms. ***5-13A Use Rational Numbers to Solve Problems**—Online Objective(s): To interpret products of rational numbers by describing real-life contexts. To interpret quotients of rational numbers by describing real-life contexts.
7.NS.A.2c	Apply properties of operations as strategies to multiply and divide rational numbers.	**1-7 Properties**—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14 Objective(s): To identify properties of addition. To identify properties of multiplication.

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1-9 Powers and Laws of Exponents—TE pp. 18–19B; SB pp. 18–19 / PB pp. 17–18
- Objective(s): To write the standard form for numbers that are given in exponential form.
- To write the exponential form for numbers that are given in standard form.
- To apply the multiplication laws of exponents.
- To apply the division laws of exponents.
- To identify the value of a number to the zero power.
- To simplify expressions with exponents.

1-10 Order of Operations—TE pp. 20–21B; SB pp. 20–21 / PB pp. 19–20
- Objective(s): To use the order of operations to simplify numerical expressions with grouping symbols and exponents.
- To use the order of operations to simplify numerical expressions with grouping symbols.
- To use the order of operations to simplify numerical expressions with exponents.
- To use a calculator to check solutions.

4-7 Estimate Decimal Products and Quotients—TE pp. 84–85B; SB pp. 84–85 / PB pp. 95–96
- Objective(s): To estimate decimal products by using rounding estimation.
- To estimate quotients by using rounding estimation.
- To estimate decimal products by using compatible numbers.
- To estimate quotients by using compatible numbers.
- To estimate decimal products by using powers of 10.
- To estimate quotients by using powers of 10.

4-8 Divide Decimals—TE pp. 86–87B; SB pp. 86–87 / PB pp. 97–98
- Objective(s): To divide positive and negative decimals.
- To evaluate division expressions containing decimals.

5-8 Multiply Fractions—TE pp. 122–123B; SB pp. 122–123 / PB pp. 137–138
- Objective(s): To multiply positive and negative fractions.
- To multiply positive and negative fractions and integers.
- To evaluate algebraic expressions involving multiplication of fractions and mixed numbers.

5-10 Divide Fractions—TE pp. 126–127B; SB pp. 126–127 / PB pp. 141–142
- Objective(s): To divide positive and negative fractions.
- To divide positive and negative fractions in complex fraction form.

5-11 Divide Mixed Numbers—TE pp. 128–129B; SB pp. 128–129 / PB pp. 143–144
- Objective(s): To divide positive and negative mixed numbers.
- To evaluate algebraic expressions involving division of fractions and mixed numbers.
- To simplify complex fractions containing mixed numbers.

5-15 Multiplication and Division Equations with Fractional Numbers—TE pp. 136–137B; SB pp. 136–137 / PB pp. 151–152
- Objective(s): To apply the Division Property of Equality to solve multiplication equations with fractions.
- To apply the Multiplication Property of Equality to solve division equations with fractions.

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		7-2 Fractions, Decimals, Percents—TE pp. 176–177B; SB pp. 176–177 / PB pp. 199–200 Objective(s): To write percents as fractions. To write percents as decimals. To write fractions as percents. To write decimals as percents. To compare fractions, decimals, and percents. **7-3 Percents Greater Than 100% / Less Than 1%**—TE pp. 178–179B; SB pp. 178–179 / PB pp. 201–202 Objective(s): To write decimals greater than 1 and less than 1 hundredth as percents. To write fractions greater than 1 and less than 1 hundredth as percents. To write percents greater than 100% as decimals. To write percents less than 1% as decimals. To write percents greater than 100% as fractions. To write percents less than 1% as fractions.
7.NS.A.2d	Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	**4-2 Equivalent Rational Numbers**—TE pp. 74–75B; SB pp. 74–75 / PB pp. 85–86 Objective(s): To write rational numbers in equivalent forms.
7.NS.A.2e	Recognize the difference between rational or irrational numbers.	**4-1 Rational Numbers**—TE pp. 72–73B; SB pp. 72–73 / PB pp. 83–84 Objective(s): To identify rational numbers. To identify rational numbers as terminating or nonterminating repeating decimals To locate rational numbers on a number line. **10-4 Irrational Numbers**—TE pp. 278–279B; SB pp. 278–279 / PB pp. 313–314 Objective(s): To distinguish rational and irrational numbers. To approximate the square root of a number that is not a perfect square. To locate irrational numbers on a number line.
7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers fluently.	**1-3 Add Integers**—TE pp. 6–7B; SB pp. 6–7 / PB pp. 5–6 Objective(s): To model addition of integers. To add integers with like signs. To add integers with unlike signs. To add more than two integers. **1-4 Subtract Integers**—TE pp. 8–9B; SB pp. 8–9 / PB pp. 7–8 Objective(s): To model subtraction of integers. To subtract integers with like signs. To subtract integers with unlike signs. **1-5 Multiply Integers**—TE pp. 9–10B; SB pp. 10–11 / PB pp. 9–10 Objective(s): To multiply integers with models. To multiply integers without models. **1-6 Divide Integers**—TE pp. 12–13B; SB pp. 12–13 / PB pp. 11–12 Objective(s): To divide integers with models. To divide integers without models. **1-7 Properties**—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14 Objective(s): To identify properties of addition. To identify properties of multiplication. **1-8 Closure Property**—TE pp. 16–17B; SB pp. 16–17 / PB pp. 15–16 Objective(s): To identify the closure properties for any defined set of numbers.

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***1-10A Solve Real-World Problems with Operations and Properties**—Online
Objective(s): To use all four operations, properties, and order of operations with integers to solve real-life problems.

1-12 Problem Solving Strategy: Guess and Test—TE pp. 24–25B; SB pp. 24–25 / PB pp. 23–24
Objective(s): To solve problems using the strategy *Guess and Test*.

3-7 Problem Solving Strategy: Find a Pattern—TE pp. pp. 66–67B; SB pp. 66–67 / PB pp. 73–74
Objective(s): To solve problems using the strategy *Find a Pattern*.

4-5 Add and Subtract Decimals—TE pp. 80–81B; SB pp. 80–81 / PB pp. 91–92
Objective(s): To add positive and negative decimals.
To subtract positive and negative decimals.
To add more than two addends.

4-6 Multiply Decimals—TE pp. 82–83B; SB pp. 82–83 / PB pp. 93–94
Objective(s): To multiply positive and negative decimals.
To multiply more than two decimal factors.

4-8 Divide Decimals—TE pp. 86–87B; SB pp. 86–87 / PB pp. 97–98
Objective(s): To divide positive and negative decimals.
To evaluate division expressions containing decimals.

4-12 Addition and Subtraction Equations with Decimals—TE pp. 94–95B; SB pp. 94–95 / PB pp. 105–106
Objective(s): To apply the Subtraction Property of Equality to solve addition equations with decimals.
To apply the Addition Property of Equality to solve subtraction equations with decimals.

4-13 Multiplication and Division Equations with Decimals—TE pp. 96–97B; SB pp. 96–97 / PB pp. 107–108
Objective(s): To apply the Division Property of Equality to solve multiplication equations with decimals.
To apply the Multiplication Property of Equality to solve division equations with decimals.

4-14 Solve Two-Step Equations with Decimals—TE pp. 98–99B; SB pp. 98–99 / PB pp. 109–110
Objective(s): To solve two-step algebraic equations containing decimals by applying the appropriate properties of equality.

5-6 Add and Subtract Fractions—TE pp. 118–119B; SB pp. 118–119 / PB pp. 133–134
Objective(s): To add and subtract positive and negative fractions.

5-7 Add and Subtract Mixed Numbers—TE pp. 120–121B; SB pp. 120–121 / PB pp. 135–136
Objective(s): To add and subtract positive and negative mixed numbers.

5-8 Multiply Fractions—TE pp. 122–123B; SB pp. 122–123 / PB pp. 137–138
Objective(s): To multiply positive and negative fractions.
To multiply positive and negative fractions and integers.
To evaluate algebraic expressions involving multiplication of fractions and mixed numbers.

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Archdiocese of Detroit: Seventh Grade Mathematics Standards		Sadlier *Fundamentals of Algebra*, Grade 7
		5-9 Multiply Mixed Numbers—TE pp. 124–125B; SB pp. 124–125 / PB pp. 139–140 Objective(s): To estimate the product of mixed numbers. To multiply positive and negative mixed numbers. To evaluate algebraic expressions involving multiplication of fractions and mixed numbers. **5-10 Divide Fractions**—TE pp. 126–127B; SB pp. 126–127 / PB pp. 141–142 Objective(s): To divide positive and negative fractions. To divide positive and negative fractions in complex fraction form. **5-11 Divide Mixed Numbers**—TE pp. 128–129B; SB pp. 128–129 / PB pp. 143–144 Objective(s): To divide positive and negative mixed numbers. To evaluate algebraic expressions involving division of fractions and mixed numbers. To simplify complex fractions containing mixed numbers. ***5-11A Different Ways to Solve Problems with Rational Numbers**—Online Objective(s): To solve a problem requiring the use of rational numbers by both an arithmetic and an algebraic method. To compare the sequence of operations in an arithmetic solution to the sequence of steps in an algebraic solution. **5-12 Properties of Rational Numbers**—TE pp. 130–131B; SB pp. 130–131 / PB pp. 145–146 Objective(s): To identify properties of addition and multiplication of rational numbers. To use the properties to compute mentally with rational numbers. **5-16 Solve Two-Step Equations with Fractions**—TE pp. 138–139B; SB pp. 138–139 / PB pp. 153–154 Objective(s): To solve two-step algebraic equations with fractions and mixed numbers by applying the appropriate properties of equality and the Inverse Properties of Addition and Multiplication.
7.NS.A.4	Estimate results of computations with rational numbers.	**2-4 Solve Addition Equations** (estimate)—TE pp. 36–37B; SB pp. 36–37 / PB pp. 39–40 Objective(s): To apply the Subtraction Property of Equality to solve algebraic addition equations with integers. To combine numerical terms to simplify addition equations with integers. **2-5 Solve Subtraction Equations** (estimate)—TE pp. 38–39B; SB pp. 38–39 / PB pp. 41–42 Objective(s): To apply the Addition Property of Equality to solve algebraic subtraction equations with integers. To write a related sentence to solve for the subtrahend. To combine numerical terms to simplify subtraction equations with integers.

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4-4 Estimate Decimal Sums and Differences—TE pp. 78–79B; SB pp. 78–79 / PB pp. 89–90
- Objective(s): To estimate differences using rounding estimation.
- To estimate decimal sums using rounding estimation.
- To estimate decimal sums using front-end estimation.
- To estimate differences using front-end estimation.
- To estimate decimal sums using clustering estimation.
- To estimate differences using clustering estimation.

4-5 Add and Subtract Decimals (estimate)—TE pp. 80–81B; SB pp. 80–81 / PB pp. 91–92
- Objective(s): To add positive and negative decimals.
- To subtract positive and negative decimals.
- To add more than two addends.

4-6 Multiply Decimals (estimate)—TE pp. 82–83B; SB pp. 82–83 / PB pp. 93–94
- Objective(s): To multiply positive and negative decimals.
- To multiply more than two decimal factors.

4-7 Estimate Decimal Products and Quotients—TE pp. 84–85B; SB pp. 84–85 / PB pp. 95–96
- Objective(s): To estimate decimal products by using rounding estimation.
- To estimate quotients by using rounding estimation.
- To estimate decimal products by using compatible numbers.
- To estimate quotients by using compatible numbers.
- To estimate decimal products by using powers of 10.
- To estimate quotients by using powers of 10.

4-8 Divide Decimals—TE pp. 86–87B; SB pp. 86–87 / PB pp. 97–98
- Objective(s): To divide positive and negative decimals.
- To evaluate division expressions containing decimals.

4-13 Multiplication and Division Equations with Decimals (estimate)—TE pp. 96–97B; SB pp. 96–97 / PB pp. 107–108
- Objective(s): To apply the Division Property of Equality to solve multiplication equations with decimals.
- To apply the Multiplication Property of Equality to solve division equations with decimals.

5-7 Add and Subtract Mixed Numbers (estimate)c—TE pp. 120–121B; SB pp. 120–121 / PB pp. 135–136
- Objective(s): To add and subtract positive and negative mixed numbers.

5-9 Multiply Mixed Numbers (estimate)—TE pp. 124–125B; SB pp. 124–125 / PB pp. 139–140
- Objective(s): To estimate the product of mixed numbers.
- To multiply positive and negative mixed numbers.
- To evaluate algebraic expressions involving multiplication of fractions and mixed numbers.

5-11 Divide Mixed Numbers (estimate)—TE pp. 128–129B; SB pp. 128–129 / PB pp. 143–144
- Objective(s): To divide positive and negative mixed numbers.
- To evaluate algebraic expressions involving division of fractions and mixed numbers.
- To simplify complex fractions containing mixed numbers.

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		7-7 Estimate with Percents—TE pp. 186–187B; SB pp. 186–187 / PB pp. 209–210 Objective(s): To estimate to find percent. To estimate a percent from a model that is not 100 units. To estimate a percent from a three-dimensional model. **7-10 Sales Tax and Tips** (estimate)—TE pp. 192–193B; SB pp. 192–193 / PB pp. 215–216 Objective(s): To calculate sales tax and total cost. To read and use a tax table. To calculate a tip and total cost. **Skills Update: V. Estimate Sums and Differences**—SB p. 409 **Skills Update: IX. Estimate Products**—SB p. 411 **Skills Update: X. Estimate Quotients**—SB p. 411
7.NS.A.5	Estimate values of square root and cube root.	**10-3 Squares and Square Roots**—TE pp. 276–277B; SB pp. 276–277 / PB pp. 311–312 Objective(s): To find the square root of a perfect square. To identify negative square roots of perfect squares. To simplify expressions involving perfect squares. To simplify expression involving square roots. To use a calculator to find square roots. Related content— **1-9 Powers and Laws of Exponents**—TE pp. 18–19B; SB pp. 18–19 / PB pp. 17–18 Objective(s): To write the standard form for numbers that are given in exponential form. To write the exponential form for numbers that are given in standard form. To apply the multiplication laws of exponents. To apply the division laws of exponents. To identify the value of a number to the zero power. To simplify expressions with exponents. **2-1 Mathematical Expressions**—TE pp. 30–31B; SB pp. 30–31 / PB pp. 33–34 Objective(s): To translate word phrases into numerical expressions. To translate word phrases into algebraic expressions. To translate numerical expressions into word phrases. To translate algebraic expressions into word phrases. *For instruction on cube roots, see Grade 8, Lesson 12-5A Perfect Cubes and Cube Roots—Online.

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Archdiocese of Detroit: Seventh Grade Mathematics Standards	Sadlier *Fundamentals of Algebra*, Grade 7
Use properties of operations to generate equivalent expressions.	
7.EE.A.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	**2-2 Simplify and Evaluate Algebraic Expressions**—TE pp. 32–33B; SB pp. 32–33 / PB pp. 35–36 Objective(s): To translate one-step verbal expressions into algebraic expressions. To translate two-step verbal expressions into algebraic expressions. To evaluate algebraic expressions. To simplify algebraic expressions by combining like terms. To simplify algebraic expressions by using properties. ***5-13B Combining Like Terms**—Online Objective(s): To apply properties of operations as strategies to add and subtract linear expressions with rational coefficients. ***5-13C Factoring and Expanding Linear Expressions**—Online Objective(s): To apply properties of operations as strategies to factor and expand linear expressions with rational coefficients. **14-3 Add Polynomials**—TE pp. 386–387B; SB pp. 386–387 / PB pp. 437–438 Objective(s): To model addition of polynomials with algebra tiles. To add polynomials algebraically. **14-4 Subtract Polynomials**—TE pp. 388–389B; SB pp. 388–389 / PB pp. 439–440 Objective(s): To model subtraction of polynomials with algebra tiles. To subtract polynomials algebraically. **14-5 Multiply and Divide Monomials**—TE pp. 390–391B; SB pp. 390–391 / PB pp. 441–442 Objective(s): To model multiplication and division of monomials with algebra tiles. To apply the Laws of Exponents to multiply monomials algebraically. To apply the Laws of Exponents to divide monomials algebraically. **14-6 Multiply Polynomials by Monomials**—TE pp. 392–393B; SB pp. 392–393 / PB pp. 443–444 Objective(s): To model the product of polynomials and monomials with algebra tiles. To apply the Distributive Property to multiply a polynomial by a monomial. **14-7 Divide Polynomials by Monomials**—TE pp. 394–395B; SB pp. 394–395 / PB pp. 445–446 Objective(s): To model division by a monomial with algebra tiles. To apply the Law of Exponents to divide a polynomial by a monomial. **14-8 Solve Multistep Equations**—TE pp. 396–397B; SB pp. 396–397 / PB pp. 447–448 Objective(s): To solve multistep linear equations. To solve multistep equations with one variable on both sides of the equation.

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7.EE.A.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."*	**2-1 Mathematical Expressions**—TE pp. 30–31B; SB pp. 30–31 / PB pp. 33–34 Objective(s): To translate word phrases into numerical expressions. To translate word phrases into algebraic expressions. To translate numerical expressions into word phrases. To translate algebraic expressions into word phrases. ***7-11A Equivalent Expressions for Percents**—Online Objective(s): To write an expression involving percent in an equivalent form. To interpret the meanings of equivalent forms of expressions involving percents. ***11-10A Write Expressions in Different Ways**—Online Objective(s): To use properties and order of operations to rewrite expressions in different forms.
Solve real-life and mathematical problems using numerical and algebraic expressions and equations.		
7.EE.B.3	Solve multi-step real-life mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically.	
7.EE.B.3a	Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*	**1-3 Add Integers**—TE pp. 6–7B; SB pp. 6–7 / PB pp. 5–6 Objective(s): To model addition of integers. To add integers with like signs. To add integers with unlike signs. To add more than two integers. **1-4 Subtract Integers**—TE pp. 8–9B; SB pp. 8–9 / PB pp. 7–8 Objective(s): To model subtraction of integers. To subtract integers with like signs. To subtract integers with unlike signs. **1-5 Multiply Integers**—TE pp. 9–10B; SB pp. 10–11 / PB pp. 9–10 Objective(s): To multiply integers with models. To multiply integers without models. **1-6 Divide Integers**—TE pp. 12–13B; SB pp. 12–13 / PB pp. 11–12 Objective(s): To divide integers with models. To divide integers without models. **1-7 Properties**—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14 Objective(s): To identify properties of addition. To identify properties of multiplication. **1-8 Closure Property**—TE pp. 16–17B; SB pp. 16–17 / PB pp. 15–16 Objective(s): To identify the closure properties for any defined set of numbers. ***1-10A Solve Real-World Problems with Operations and Properties**—Online Objective(s): To use all four operations, properties, and order of operations with integers to solve real-life problems. **1-12 Problem Solving Strategy: Guess and Test**—TE pp. 24–25B; SB pp. 24–25 / PB pp. 23–24 Objective(s): To solve problems using the strategy *Guess and Test*. **3-7 Problem Solving Strategy: Find a Pattern**—TE pp. pp. 66–67B; SB pp. 66–67 / PB pp. 73–74 Objective(s): To solve problems using the strategy *Find a Pattern*.

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4-5 Add and Subtract Decimals—TE pp. 80–81B; SB pp. 80–81 / PB pp. 91–92
Objective(s): To add positive and negative decimals.
To subtract positive and negative decimals.
To add more than two addends.

4-6 Multiply Decimals—TE pp. 82–83B; SB pp. 82–83 / PB pp. 93–94
Objective(s): To multiply positive and negative decimals.
To multiply more than two decimal factors.

4-8 Divide Decimals—TE pp. 86–87B; SB pp. 86–87 / PB pp. 97–98
Objective(s): To divide positive and negative decimals.
To evaluate division expressions containing decimals.

4-12 Addition and Subtraction Equations with Decimals—TE pp. 94–95B; SB pp. 94–95 / PB pp. 105–106
Objective(s): To apply the Subtraction Property of Equality to solve addition equations with decimals.
To apply the Addition Property of Equality to solve subtraction equations with decimals.

4-13 Multiplication and Division Equations with Decimals—TE pp. 96–97B; SB pp. 96–97 / PB pp. 107–108
Objective(s): To apply the Division Property of Equality to solve multiplication equations with decimals.
To apply the Multiplication Property of Equality to solve division equations with decimals.

4-14 Solve Two-Step Equations with Decimals—TE pp. 98–99B; SB pp. 98–99 / PB pp. 109–110
Objective(s): To solve two-step algebraic equations containing decimals by applying the appropriate properties of equality.

5-6 Add and Subtract Fractions—TE pp. 118–119B; SB pp. 118–119 / PB pp. 133–134
Objective(s): To add and subtract positive and negative fractions.

5-7 Add and Subtract Mixed Numbers—TE pp. 120–121B; SB pp. 120–121 / PB pp. 135–136
Objective(s): To add and subtract positive and negative mixed numbers.

5-8 Multiply Fractions—TE pp. 122–123B; SB pp. 122–123 / PB pp. 137–138
Objective(s): To multiply positive and negative fractions.
To multiply positive and negative fractions and integers.
To evaluate algebraic expressions involving multiplication of fractions and mixed numbers.

5-9 Multiply Mixed Numbers—TE pp. 124–125B; SB pp. 124–125 / PB pp. 139–140
Objective(s): To estimate the product of mixed numbers.
To multiply positive and negative mixed numbers.
To evaluate algebraic expressions involving multiplication of fractions and mixed numbers.

5-10 Divide Fractions—TE pp. 126–127B; SB pp. 126–127 / PB pp. 141–142
Objective(s): To divide positive and negative fractions.
To divide positive and negative fractions in complex fraction form.

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Archdiocese of Detroit: Seventh Grade Mathematics Standards		Sadlier *Fundamentals of Algebra*, Grade 7
		5-11 Divide Mixed Numbers—TE pp. 128–129B; SB pp. 128–129 / PB pp. 143–144 Objective(s): To divide positive and negative mixed numbers. To evaluate algebraic expressions involving division of fractions and mixed numbers. To simplify complex fractions containing mixed numbers. **5-12 Properties of Rational Numbers**—TE pp. 130–131B; SB pp. 130–131 / PB pp. 145–146 Objective(s): To identify properties of addition and multiplication of rational numbers. To use the properties to compute mentally with rational numbers. **5-16 Solve Two-Step Equations with Fractions**—TE pp. 138–139B; SB pp. 138–139 / PB pp. 153–154 Objective(s): To solve two-step algebraic equations with fractions and mixed numbers by applying the appropriate properties of equality and the Inverse Properties of Addition and Multiplication.
7.EE.B.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.	
7.EE.B.4a	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently.	**2-4 Solve Addition Equations**—TE pp. 36–37B; SB pp. 36–37 / PB pp. 39–40 Objective(s): To apply the Subtraction Property of Equality to solve algebraic addition equations with integers. To combine numerical terms to simplify addition equations with integers. **2-5 Solve Subtraction Equations**—TE pp. 38–39B; SB pp. 38–39 / PB pp. 41–42 Objective(s): To apply the Addition Property of Equality to solve algebraic subtraction equations with integers. To write a related sentence to solve for the subtrahend. To combine numerical terms to simplify subtraction equations with integers. **2-6 Solve Multiplication Equations—TE pp. 40–41B; SB pp. 40–41 / PB pp. 43–44** Objective(s): To apply the Division Property of Equality to solve algebraic multiplication equations with integers. To combine numerical terms to simplify multiplication equations. **2-7 Solve Division Equations—TE pp. 42–43B; SB pp. 42–43 / PB pp. 45–46** Objective(s): To apply the Multiplication Property of Equality to solve algebraic division equations with integers. ***2-8A Solving Equations of the Form a(x + b) = c Using Integers**—Online Objective(s): To solve word problems leading to equations of the form $ax + b = c$ and $a(x + b) = c$, when a, b, and c are integers.

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		***2-9A Compare Arithmetic and Algebraic Problem-Solving Methods**—Online Objective(s): To solve a problem by both an arithmetic and an algebraic method. To compare the sequence of operations in an arithmetic solution to the sequence of steps in an algebraic solution. **4-14 Solve Two-Step Equations with Decimals**—TE pp. 98–99B; SB pp. 98–99 / PB pp. 109–110 Objective(s): To solve two-step algebraic equations containing decimals by applying the appropriate properties of equality. ***4-14A Solving Equations of the Form a(x + b) = Using Decimals**—Online Objective(s): To solve word problems leading to equations of the form $ax + b = c$ and $a(x + b) = c$, when a, b, and c are decimals. ***5-11A Different Ways to Solve Problems with Rational Numbers**—Online Objective(s): To solve a problem requiring the use of rational numbers by both an arithmetic and an algebraic method. To compare the sequence of operations in an arithmetic solution to the sequence of steps in an algebraic solution. **5-16 Solve Two-Step Equations with Fractions**—TE pp. 138–139B; SB pp. 138–139 / PB pp. 153–154 Objective(s): To solve two-step algebraic equations with fractions and mixed numbers by applying the appropriate properties of equality and the Inverse Properties of Addition and Multiplication. ***5-16A Solving Equations of the Form a(x + b) = c Using Fractions**—Online Objective(s): To solve word problems leading to equations of the form $ax + b = c$ and $a(x + b) = c$, when a, b, and c are fractions or mixed numbers.
7.EE.B.4b	Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.*	**3-1 Inequalities**—TE pp. 54–55B; SB pp. 54–55 / PB pp. 61–62 Objective(s): To identify and use inequality symbols. To express inequalities as word sentences. To express word sentences as inequalities. To determine if a value makes an inequality true or false. **3-4 Solve Inequalities Using Addition and Subtraction**—TE pp. 60–61B; SB pp. 60–61 / PB pp. 67–68 Objective(s): To solve one-step inequalities by applying the Addition Property of Inequality. To solve one-step inequalities by applying the Subtraction Property of Inequality. To graph the solution set of an inequality. ***3-6A Solve Two-Step Inequalities**—Online Objective(s): To solve word problems involving inequalities by graphing the solution set of the inequality and interpreting it in the context of the problem.

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		14-9 Addition and Subtraction: Inequalities with Rational Numbers—TE pp. 398–399B; SB pp. 398–399 / PB pp. 449–450 Objective(s): To solve one-step inequalities using the Addition or Subtraction Properties of Inequality. To graph the solution sets of inequalities involving rational numbers. **14-10 Multiplication and Division: Inequalities with Rational Numbers**—TE pp. 400–401B; SB pp. 400–401 / PB pp. 451–452 Objective(s): To solve one-and two-step inequalities involving rational numbers using the Multiplication and Division Properties of Inequality. To graph the solution sets of inequalities involving rational numbers.
7.EE.B.5	Add, subtract, and multiply simple algebraic expressions e.g., (92*x* + 8*y*) – 5*x* + *y*, or *x*(*x* + 2) and justify using properties of real numbers.	**1-7 Properties**—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14 Objective(s): To identify properties of addition. To identify properties of multiplication. **1-8 Closure Property**—TE pp. 16–17B; SB pp. 16–17 / PB pp. 15–16 Objective(s): To identify the closure properties for any defined set of numbers. **1-9 Powers and Laws of Exponents**—TE pp. 18–19B; SB pp. 18–19 / PB pp. 17–18 Objective(s): To write the standard form for numbers that are given in exponential form. To write the exponential form for numbers that are given in standard form. To apply the multiplication laws of exponents. To apply the division laws of exponents. To identify the value of a number to the zero power. To simplify expressions with exponents. **1-10 Order of Operations**—TE pp. 20–21B; SB pp. 20–21 / PB pp. 19–20 Objective(s): To use the order of operations to simplify numerical expressions with grouping symbols and exponents. To use the order of operations to simplify numerical expressions with grouping symbols. To use the order of operations to simplify numerical expressions with exponents. To use a calculator to check solutions. ***1-10A Solve Real-World Problems with Operations and Properties**—Online Objective(s): To use all four operations, properties, and order of operations with integers to solve real-life problems. **2-1 Mathematical Expressions**—TE pp. 30–31B; SB pp. 30–31 / PB pp. 33–34 Objective(s): To translate word phrases into numerical expressions. To translate word phrases into algebraic expressions. To translate numerical expressions into word phrases. To translate algebraic expressions into word phrases.

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		2-2 Simplify and Evaluate Algebraic Expressions—TE pp. 32–33B; SB pp. 32–33 / PB pp. 35–36 Objective(s): To translate one-step verbal expressions into algebraic expressions. To translate two-step verbal expressions into algebraic expressions. To evaluate algebraic expressions. To simplify algebraic expressions by combining like terms. To simplify algebraic expressions by using properties.
7.EE.B.6	Identify and combine like terms in polynomials.	**14-2 Model Polynomials**—TE pp. 384–385B; SB pp. 384–385 / PB pp. 435–436 Objective(s): To model polynomials using algebra tiles. To simplify polynomials.
Understand and Apply Directly Proportional Relationships and Relate to Linear Relationships		
7.EE.C.7	Given a directly proportional or other linear situation, graph and interpret the slope and intercept(s) in terms of the original situation; evaluate $y = mx + b$ for specific x values (weight vs. volume of water, base cost plus cost per unit).	**6-4 Direct Proportion**—TE pp. 154–155B; SB pp. 154–155 / PB pp. 173–174 Objective(s): To apply the concept of direction proportions. **13-7 Slope**—TE pp. 364–365B; SB pp. 364–365 / PB pp. 411–412 Objective(s): To find the slope of a line. To identify the four kinds of slope.
7.EE.C.8	For directly proportional or linear situations, solve applied problems using graphs and equations (e.g., the heights and volume of a container with uniform cross-section; height of water in a tank being filled at a constant rate; degrees; degrees Celsius and degrees Fahrenheit; distance and time under constant speed).	**6-4 Direct Proportion**—TE pp. 154–155B; SB pp. 154–155 / PB pp. 173–174 Objective(s): To apply the concept of direction proportions. ***6-6A Identify Unit Rate**—Online Objective(s): To identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. ***6-6B Proportional Relationships and Equations**—Online Objective(s): To represent proportional relationships by equations. To interpret the situational meaning of point on the graph of a proportional relationship. ***6-6C Use Proportional Relationships and Equations to Solve Problems**—Online Objective(s): To solve problems by representing proportional relationships by equations. To interpret the situational meaning of point on the graph of a proportional relationship.
7.EE.C.9	Recognize and use directly proportional relationships of the form $y = mx$, and distinguish from linear relationships of the form $y = mx + b$, b non-zero; understand that in a directly proportional relationship between two quantities, one quantity is a constant multiple of the other quantity.	**13-7 Slope**—TE pp. 364–365B; SB pp. 364–365 / PB pp. 411–412 Objective(s): To find the slope of a line. To identify the four kinds of slope. ***13-8A Identify Constant of Proportionality**—Online Objective(s): To identify the constant of proportionality (unit rate) in real-world (quadrant I) graphs. To relate unit rate and steepness and understand what unit rate means in relation to its visual appearance in a graph.

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Expressions & Equations

Archdiocese of Detroit: Seventh Grade Mathematics Standards		Sadlier *Fundamentals of Algebra*, Grade 7
		***13-8B Graph Proportional Relationships**—Online Objective(s): To represent proportional relationships by equations and graphs on the coordinate plane in all four quadrants. To interpret the situational meaning of point on the graph of a proportional relationship.
Understand and Represent Linear Functions		
7.EE.D.10	Find and interpret the *x* and/or *y* intercepts of a linear equation or function. Know that the solution to a linear equation of the form $ax + b = 0$ corresponds to the point at which the graph of $y = ax + b$ crosses the *x*-axis.	**13-5 Functions**—TE pp. 360–361B; SB pp. 360–361 / PB pp. 407–408 Objective(s): To write a function to represent a situation. To evaluate a function given a specific domain. To find solutions of a function by making a function table. **13-6 Graph Linear Functions**—TE pp. 362–363B; SB pp. 362–363 / PB pp. 409–410 Objective(s): To graph the solutions of a linear function. To identify a solution to a linear function from its graph. To use a graphing calculator to graph linear functions.
7.EE.D.11	Represent linear functions in the form $y = x + b$, $y = mx$, $y = mx + b$, and graph, interpreting slope and *y* intercept.	**13-5 Functions**—TE pp. 360–361B; SB pp. 360–361 / PB pp. 407–408 Objective(s): To write a function to represent a situation. To evaluate a function given a specific domain. To find solutions of a function by making a function table. **13-6 Graph Linear Functions**—TE pp. 362–363B; SB pp. 362–363 / PB pp. 409–410 Objective(s): To graph the solutions of a linear function. To identify a solution to a linear function from its graph. To use a graphing calculator to graph linear functions. **13-7 Slope**—TE pp. 364–365B; SB pp. 364–365 / PB pp. 411–412 Objective(s): To find the slope of a line. To identify the four kinds of slope.
7.EE.D.12	Calculate the slope from the graph of a linear function as the ratio of "rise/run" for a pair of points on the graph, and express the answer as a fraction and a decimal; understand that the linear functions have slope that is a constant rate of change.	**13-7 Slope**—TE pp. 364–365B; SB pp. 364–365 / PB pp. 411–412 Objective(s): To find the slope of a line. To identify the four kinds of slope.
7.EE.D.13	From applied situations, generate and solve linear equations of the form $ax + b = c$ and $ax + b = cx + d$, and interpret solutions.	**13-7 Slope**—TE pp. 364–365B; SB pp. 364–365 / PB pp. 411–412 Objective(s): To find the slope of a line. To identify the four kinds of slope.
Understand and Solve Problems About Inversely Proportional Relationships		
7.EE.E.14	Recognize inversely proportional relationships in contextual situations; know that quantities are inversely proportional if their product is constant, (e.g., the length and width of a rectangle with fixed area, and the inversely proportional relationship is of the form $y = k/x$ where *x* is some non-zero number).	**6-9 Inverse Proportion**—TE pp. 164–165B; SB pp. 164–165 / PB pp. 183–184 Objective(s): To solve inverse proportions.

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Expressions & Equations

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7.EE.E.15	Know that the graph of $y = k/x$ is not a line, know its shape, and know that it crosses neither the x nor the y axis.	Related content— **6-9 Inverse Proportion**—TE pp. 164–165B; SB pp. 164–165 / PB pp. 183–184 Objective(s): To solve inverse proportions.

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Geometry

Archdiocese of Detroit: Seventh Grade Mathematics Standards		Sadlier *Fundamentals of Algebra*, Grade 7
Draw construct, and describe geometrical figures and describe the relationships between them.		
7.G.A.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. Recognize that they are similar figures.	**6-6 Scale Drawings and Models**—TE pp. 158–159B; SB pp. 158–159 / PB pp. 177–178 Objective(s): To use proportions to solve scale-drawing problems. To use proportions to solve scale-model problems. To use a map scale. To use a scale factor to make a scale model. **10-5 Pythagorean Theorem**—TE pp. 280–281B; SB pp. 280–281 / PB pp. 315–316 Objective(s): To use the Pythagorean Theorem to find a missing side of a right triangle. To determine whether a given triangle is a right triangle.
7.G.A.2	Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	**9-7 Polygons**—TE pp. 252–253B; SB pp. 252–253 / PB pp. 283–284 Objective(s): To find the exterior angles of polygons. To find the interior angles of polygons. To identify regular polygons. To identify convex polygons. To identify concave polygons. To find the sum of angle measures of polygons. To find the missing measure of angles of a polygon. **9-9 Congruent Triangles**—TE pp. 256–257B; SB pp. 256–257 / PB pp. 287–288 Objective(s): To identify congruent triangles. To explore angle-side relations in triangles. To use congruent parts of congruent triangles to find missing angle. To use congruent parts of congruent triangles to find side measures. **9-10 Triangle Constructions**—TE pp. 258–259B; SB pp. 258–259 / PB pp. 289–290 Objective(s): To construct a triangle congruent to a given triangle. To construct a triangle given three line segments.
7.G.A.3	Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	**11-1 Three-Dimensional Figures**—TE pp. 302–303B; SB pp. 302–303 / PB pp. 341–342 Objective(s): To define, identify, and classify polyhedrons by their characteristics. To distinguish between regular and not regular polyhedrons. To define, identity, and classify solid figures that have curved surfaces. **11-2 Draw Three-Dimensional Figures**—TE pp. 304–305B; SB pp. 304–305 / PB pp. 343–344 Objective(s): To interpret and create isometric drawings. To interpret and to create orthographic drawings. ***11-2A Draw Three-Dimensional Figures**—Online Objective(s): To describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

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Geometry

Archdiocese of Detroit: Seventh Grade Mathematics Standards		Sadlier *Fundamentals of Algebra*, Grade 7
		11-5 Surface Area of Cylinders and Cones—TE pp. 310–311B; SB pp. 310–311 / PB pp. 349–350 Objective(s): To draw nets to find the surface area of cylinders and cones. To use nets to find the surface area of cylinders and cones. To use formulas to find the surface area of cylinders. To use formulas to find the surface area of cones.
Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.		
7.G.B.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	**10-8 Circumference and Area of a Circle**—TE pp. 286–287B; SB pp. 286–287 / PB pp. 321–322 Objective(s): To use a formula to find the circumference of a circle. To use a formula to find the area of a circle. To find the radius of a circle given its circumference. To find the radius of a circle given its area. To find the diameter of a circle given its circumference. To find the diameter of a circle given its area.
7.G.B.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	**9-3 Angle Pairs**—TE pp. 244–245B; SB pp. 244–245 / PB pp. 275–276 Objective(s): To identify complementary angles. To identify supplementary angles. To identify adjacent angles. To identify vertical angles. To find missing angle measures by solving equations. **9-4 Parallel Lines and Transversals**—TE pp. 246–247B; SB pp. 246–247 / PB pp. 277–278 Objective(s): To identify the kinds of angles formed when a pair of parallel lines is intersected by a transversal. To use the properties of angle pairs and parallel lines to find missing angle measures. **9-9 Congruent Triangles**—TE pp. 256–257B; SB pp. 256–257 / PB pp. 287–288 Objective(s): To identify congruent triangles. To explore angle-side relations in triangles. To use congruent parts of congruent triangles to find missing angle. To use congruent parts of congruent triangles to find side measures.
7.G.B.6	Explore trigonometric ratios of right triangles (sine, cosine, and tangent).	**Formula Chart**—TE p. 440; SB p. 440 Trigonometric Ratios *See instruction in Grade 8, *Foundations of Algebra*, Lesson 7-10 Trigonometric Ratios—pp. 206–207
7.G.B.7	Understand that in similar polygons, corresponding angles are congruent and the ratios of corresponding sides are equal; understand the concepts of similar figures and scale factor.	**6-6 Scale Drawings and Models**—TE pp. 158–159B; SB pp. 158–159 / PB pp. 177–178 Objective(s): To use proportions to solve scale-drawing problems. To use proportions to solve scale-model problems. To use a map scale. To use a scale factor to make a scale model.

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Geometry

Archdiocese of Detroit: Seventh Grade Mathematics Standards		Sadlier *Fundamentals of Algebra*, Grade 7
		6-7 Similarity—TE pp. 160–161B; SB pp. 160–161 / PB pp. 179–180 Objective(s): To determine similarity. To name corresponding parts of similar figures. To use proportions to find missing dimensions. **9-5 Congruent Angles and Line Segments**—TE pp. 248–249B; SB pp. 248–249 / PB pp. 279–280 Objective(s): To recognize congruent angles. To recognize line segments. To identify line segment bisectors. To identify midpoints. To identify perpendicular bisectors. To identify angle bisectors. To construct the bisector of a given angle. To construct the perpendicular bisector of a given line segment.
7.G.B.8	Show that two triangles are similar using the criteria: corresponding angles are congruent (AAA similarity); the ratios of two pairs of corresponding sides are equal and the included angles are congruent (SAS similarity); ratios of all pairs of corresponding sides are equal (SSS similarity); use this criteria to solve problems and to justify arguments.	**9-9 Congruent Triangles**—TE pp. 256–257B; SB pp. 256–257 / PB pp. 287–288 Objective(s): To identify congruent triangles. To explore angle-side relations in triangles. To use congruent parts of congruent triangles to find missing angle. To use congruent parts of congruent triangles to find side measures.
7.G.B.9	Understand and use the fact that when two triangles are similar with scale factor of r, their areas are related by a factor of r^2.	Related content— **6-6 Scale Drawings and Models**—TE pp. 158–159B; SB pp. 158–159 / PB pp. 177–178 Objective(s): To use proportions to solve scale-drawing problems. To use proportions to solve scale-model problems. To use a map scale. To use a scale factor to make a scale model. **6-7 Similarity**—TE pp. 160–161B; SB pp. 160–161 / PB pp. 179–180 Objective(s): To determine similarity; to name corresponding parts of similar figures. To use proportions to find missing dimensions. **6-8 Indirect Measurement**—TE pp. 162–163B; SB pp. 162–163 / PB pp. 181–182 Objective(s): To solve problems involving indirect measurement by using similar right triangles.
7.G.B.10	Solve real-world story and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, circles, cones, pyramids, and right prisms.	**2-9 Formulas**—TE pp. 46–47B; SB pp. 46–47 / PB pp. 49–50 Objective(s): To find missing values in problems involving formulas. **10-6 Area of Parallelograms**—TE pp. 282–283B; SB pp. 282–283 / PB pp. 317–318 Objective(s): To use a formula to find the area of a parallelogram. To rename area units in equivalent forms. To explore the effect of a change in the base on a parallelogram's area. To explore the effect of change in the height on a parallelogram's area. To find an unknown base given a parallelogram's area. To find an unknown height given a parallelogram's area.

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10-7 Area of Triangles and Trapezoids—TE pp. 284–285B; SB pp. 284–285 / PB pp. 319–320
- Objective(s): To use a formula to find the area of a triangle.
- To use a formula to find the area of a trapezoid.
- To rename area units in equivalent forms.
- To find an unknown base given the area of a triangle.
- To find an unknown base given the area of a trapezoid.
- To find an unknown height given the area of a triangle.
- To find an unknown height given the area of a trapezoid.

10-8 Circumference and Area of a Circle—TE pp. 286–287B; SB pp. 286–287 / PB pp. 321–322
- Objective(s): To use a formula to find the circumference of a circle.
- To use a formula to find the area of a circle.
- To find the radius of a circle given its circumference.
- To find the radius of a circle given its area.
- To find the diameter of a circle given its circumference.

To find the diameter of a circle given its area.

10-9 Area of Complex Figures—TE pp. 288–289B; SB pp. 288–289 / PB pp. 323–324
- Objective(s): To identify polygons within a complex figure.
- To identify circles within a complex figure.
- To find or estimate the area of complex figures involving polygons and circles.
- To find missing dimensions in a complex figure given its area.

11-3 Surface Area of Prisms—TE pp. 306–307B; SB pp. 306–307 / PB pp. 345–346
- Objective(s): To draw nets to find the surface area of prisms.
- To use nets to find the surface area of prisms.
- To use formulas to find the surface area of prisms.

11-4 Surface Area of Pyramids—TE pp. 308–309B; SB pp. 308–309 / PB pp. 347–348
- Objective(s): To draw nets to find the surface area of a rectangular pyramid or a triangular pyramid.
- To use nets to find the surface area of a rectangular pyramid or a triangular pyramid.
- To use formulas to find the surface area of a rectangular pyramid.
- To use formulas to find the surface area of a triangular pyramid.
- To rename surface area units in equivalent forms.

11-5 Surface Area of Cylinders and Cones—TE pp. 310–311B; SB pp. 310–311 / PB pp. 349–350
- Objective(s): To draw nets to find the surface area of cylinders and cones.
- To use nets to find the surface area of cylinders and cones.
- To use formulas to find the surface area of cylinders.
- To use formulas to find the surface area of cones.

11-6 Estimate Surface Area—TE pp. 312–313B; SB pp. 312–313 / PB pp. 351–352
- Objective(s): To estimate the surface area of prisms.
- To estimate the surface area of cylinders.

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	11-7 Volume of Prisms—TE pp. 314–315B; SB pp. 314–315 / PB pp. 353–354 Objective(s): To use a formula to find the volume of a rectangular prism. To use a formula to find the volume of a triangular prism. To find an unknown dimension given the volume of a rectangular prism. To find an unknown dimension given the volume of a triangular prism. To rename volume units in equivalent forms. **11-8 Volume of Pyramids**—TE pp. 316–317B; SB pp. 316–317 / PB pp. 355–356 Objective(s): To use formulas to find the volumes of pyramids. To find unknown dimensions given the volumes of rectangular pyramids. To find unknown dimensions given the volumes of triangular pyramids. **11-9 Volume of Cylinders and Cones**—TE pp. 318–319B; SB pp. 318–319 / PB pp. 357–358 Objective(s): To use formulas to find the volumes of cylinders. To use formulas to find the volumes of cones. To find unknown dimensions given the volumes of cylinders. To find unknown dimensions given the volumes of cones. **11-10 Surface Area and Volume of Complex Three-Dimensional Figures**—TE pp. 320–321B; SB pp. 320–321 / PB pp. 359–360 Objective(s): To draw complex three-dimensional figures. To use nets to find the surface area of complex three-dimensional figures. To use nets to find the volume of complex three-dimensional figures. To use formulas to find the surface area of complex three-dimensional figures. To use formulas to find the volume of complex three-dimensional figures.

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Statistics & Probability

Archdiocese of Detroit: Seventh Grade Mathematics Standards		Sadlier *Fundamentals of Algebra*, Grade 7
Use random sampling to draw inferences about a population.		
7.SP.A.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	**8-1 Samples and Surveys**—TE pp. 208–209B; SB pp. 208–209 / PB pp. 235–236 Objective(s): To use sampling to conduct a survey. To make and use cumulative frequency tables to organize data. To use a sample to predict data for an entire population.
7.SP.A.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*	**8-1 Samples and Surveys**—TE pp. 208–209B; SB pp. 208–209 / PB pp. 235–236 Objective(s): To use sampling to conduct a survey. To make and use cumulative frequency tables to organize data. To use a sample to predict data for an entire population. ***8-1A Compare Experimental and Theoretical Probabilities**—Online Objective(s): To generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. To compare predictions with observed results.
7.SP.A.3	Represent and interpret data using circle graphs, stem and leaf plots, histograms, and box and whisker plots, and select appropriate representation to address specific questions.	**8-6 Histograms**—TE pp. 218–219B; SB pp. 218–219 / PB pp. 245–246 Objective(s): To make a frequency table using time intervals. To make a histogram from a frequency table. To read a histogram. **8-7 Stem-and-Leaf Plots**—TE pp. 220–221B; SB pp. 220–221 / PB pp. 247–248 Objective(s): To make stem-and-leaf plots. To read stem-and-leaf plots. **8-8 Box-and-Whisker Plots**—TE pp. 222–223B; SB pp. 222–223 / PB pp. 249–250 Objective(s): To make box-and-whisker plots. To read box-and-whisker plots. To determine and interpret clusters. To determine and interpret quartiles. To determine and interpret gaps. To determine and interpret outliers. To compare two box-and-whisker plots using the same number line. **9-13 Make a Circle Graph**—TE pp. 264–265B; SB pp. 264–265 / PB pp. 295–296 Objective(s): To make a circle graph to display a set of data.
7.SP.A.4	Create and interpret scatter plots and find line of best fit; use an estimated line of best fit to answer questions about the data.	**8-11 Scatter Plots**—TE pp. 228–229B; SB pp. 228–229 / PB pp. 255–256 Objective(s): To use a coordinate plane to make a scatter plot. To read scatter plots. To determine the line of best fit. To identify the type of correlation found in the data.

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Statistics & Probability

Archdiocese of Detroit: Seventh Grade Mathematics Standards		Sadlier *Fundamentals of Algebra*, Grade 7
Draw informal comparative inferences about two populations.		
7.SP.B.5	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.*	***8-8A Variability**—Online Objective(s): To compare the variability of two sets of data visually. ***8-8B Mean Absolute Deviation**—Online Objective(s): To compare the variability of two sets of data by comparing their Mean Absolute Deviations.
7.SP.B.6	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*	***8-8C Comparing Data Sets**—Online Objective(s): To informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.
Investigate chance processes and develop, use, and evaluate probability models.		
7.SP.C.7	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	**12-1 Sample Space**—TE pp. 330–331B; SB pp. 330–331 / PB pp. 373–374 Objective(s): To determine the sample space of an experiment. To determine the likelihood of an event. To use a tree diagram to find the sample space for two events. To use a tree diagram to determine the likelihood of an event. **12-3 Theoretical Probability**—TE pp. 334–335B; SB pp. 334–335 / PB pp. 377–378 Objective(s): To write probabilities as fractions. To write probabilities as decimals. To write probabilities as percents. To represent probabilities as fractions on a number line from 0 to 1. To represent probabilities as decimals on a number line from 0 to 1. To represent probabilites as percents on a number line from 0 to 1. To define the theoretical probability of an event and use a formula to find theoretical probability. To find the theoretical probability of complementary events.

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Statistics & Probability

Archdiocese of Detroit: Seventh Grade Mathematics Standards		Sadlier *Fundamentals of Algebra*, Grade 7
7.SP.C.8	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*	***8-1A Compare Experimental and Theoretical Probabilities**—Online Objective(s): To generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. To compare predictions with observed results. **12-4 Experimental Probability**—TE pp. 336–337B; SB pp. 336–337 / PB pp. 379–380 Objective(s): To find the experimental probability of an event. To find, record, and predict outcomes of probability experiments. To simulate events to predict probability. To simulate events to predict probability.
7.SP.C.9	Develop a probability model and use it to find probabilities of events e.g., flipping a coin. Understand the difference between theoretical probability (what should happen) and experimental probability (what does happen) and explain possible sources of the discrepancy.	
7.SP.C.9a	Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.*	**12-4 Experimental Probability**—TE pp. 336–337B; SB pp. 336–337 / PB pp. 379–380 Objective(s): To find the experimental probability of an event. To find, record, and predict outcomes of probability experiments. To simulate events to predict probability. To simulate events to predict probability.
7.SP.C.9b	Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*	***8-1A Compare Experimental and Theoretical Probabilities**—Online Objective(s): To generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. To compare predictions with observed results.
7.SP.C.10	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.	
7.SP.C.10a	Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.	**12-6 Compound Events**—TE pp. 340–341B; SB pp. 340–341 / PB pp. 383–384 Objective(s): To find the probability of independent events. To find the probability of dependent events.
7.SP.C.10b	Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.	**10-13 Problem Solving Strategy: Account for All Possibilities**—TE pp. 296–297B; SB pp. 296–297 / PB pp. 331–332 Objective(s): To solve problems using the strategy *Account for All Possibilities.* **12-2 Fundamental Counting Principle and Factorials**—TE pp. 332–333B; SB pp. 332–333 / PB pp. 375–376 Objective(s): To use the Fundamental Counting Principal to find the size of a sample space. To use factorials to find the size of a sample space.

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		12-4 Experimental Probability—TE pp. 336–337B; SB pp. 336–337 / PB pp. 379–380 Objective(s): To find the experimental probability of an event. To find, record, and predict outcomes of probability experiments. To simulate events to predict probability. To simulate events to predict probability. **12-6 Compound Events**—TE pp. 340–341B; SB pp. 340–341 / PB pp. 383–384 Objective(s): To find the probability of independent events. To find the probability of dependent events.
7.SP.C.10c	Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*	***12-6A Design a Simulation**—Online Objective(s): To design and use a simulation to generate frequencies for compound events.

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