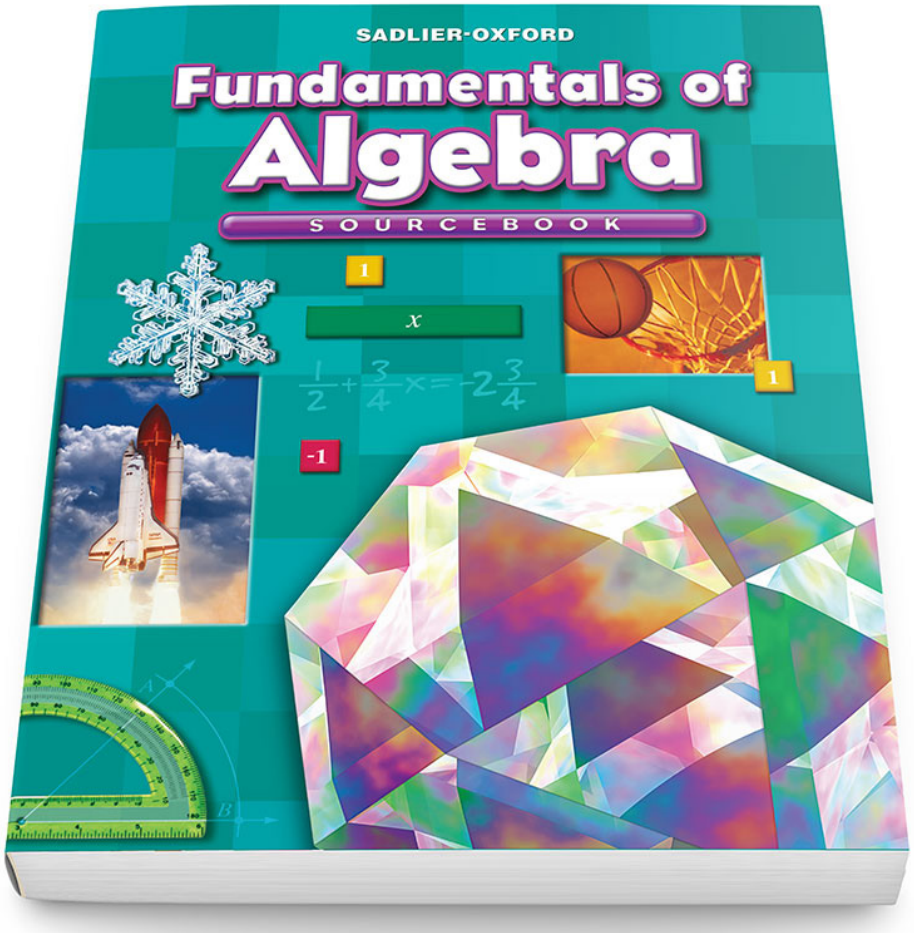
# *Fundamentals of Algebra*

Correlation to the Archdiocese of Cincinnati
2020 Graded Course of Study for Mathematics

## Grade 7

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## STANDARD 1 – RATIO AND PROPORTIONAL RELATIONSHIP (RP)

| Grade 7 Standard & Benchmark Description | *Fundamentals of Algebra*, Grade 7 |
|---|---|
| **M.RP.7.1 Analyze proportional relationships and use them to solve real-world and mathematical problems.** | |
| **M.RP.7.1.1** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in line or different units. | **Chapter 6 Ratio and Proportion**<br>6-2 Unit Rate and Unit Cost—TE pp. 150–151B; SB pp. 150–151 / PB pp. 169–170<br>6-3A Use Unit Rates—Online<br>6-3B Use Rational Numbers to Solve Problems—Online<br>6-10 Dimensional Analysis—TE pp. 166–167B; SB pp. 166–167 / PB pp. 185–186 |
| **M.RP.7.1.2** Recognize and represent proportional relationship between quantities. | **Chapter 6 Ratio and Proportion**<br>6-3 Write and Solve Proportions—TE pp. 152–153B; SB pp. 152–153 / PB pp. 171–172 |
| **M.RP.7.1.3** Decide whether two quantities are in a proportional relationship. For example, 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. | **Chapter 6 Ratio and Proportion**<br>6-3 Write and Solve Proportions—TE pp. 152–153B; SB pp. 152–153 / PB pp. 171–172 |
| **M.RP.7.1.4** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. | **Chapter 6 Ratio and Proportion**<br>6-3A Use Unit Rates—Online<br>6-3B Use Rational Numbers to Solve Problems—Online<br>6-6A Identify Unit Rate—Online<br>6-6B Proportional Relationships and Equations—Online<br>6-6C Use Proportional Relationships and Equations to Solve Problems—Online<br>**Chapter 13 Patterns, Relations, and Functions**<br>13-2 Algebraic Patterns and Sequences—TE pp. 354–355B; SB pp. 354–355 / PB pp. 401–402<br>13-7 Slope—TE pp. 364–365B; SB pp. 364–365 / PB pp. 411–412<br>13-8A Identify Constant of Proportionality—Online<br>13-8B Graph Proportional Relationships—Online |

## STANDARD 1 – RATIO AND PROPORTIONAL RELATIONSHIP (RP)

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|---|---|
| **M.RP.7.1 Analyze proportional relationships and use them to solve real-world and mathematical problems.** | |
| **M.RP.7.1.5** 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*. | **Chapter 6 Ratio and Proportion**<br>6-4 Direct Proportion—TE pp. 154–155B; SB pp. 154–155 / PB pp. 173–174<br>6-5 Proportion by Parts—TE pp. 156–157B; SB pp. 156–157 / PB pp. 175–176<br>6-6 Scale Drawings and Models—TE pp. 158–159B; SB pp. 158–159 / PB pp. 177–178<br>6-6B Proportional Relationships and Equations—Online<br>6-6C Use Proportional Relationships and Equations to Solve Problems—Online<br>**Chapter 7 Percent and Consumer Applications**<br>7-4 Find a Percentage of a Number—TE pp. 180–181B; SB pp. 180–181 / PB pp. 203–204<br>**Chapter 11 Three-Dimensional Geometry**<br>11-11 Changing Dimensions of Three-Dimensional Figures—TE pp. 322–323B; SB pp. 322–323 / PB pp. 361–362 |
| **M.RP.7.1.6** Explain what a point (*x, y*) on a 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. | **Chapter 6 Ratio and Proportion**<br>6-4 Direct Proportion—TE pp. 154–155B; SB pp. 154–155 / PB pp. 173–174<br>6-6B Proportional Relationships and Equations—Online<br>6-6C Use Proportional Relationships and Equations to Solve Problems—Online<br>**Chapter 13 Patterns, Relations, and Functions**<br>13-8B Graph Proportional Relationships—Online |
| **M.RP.7.1.7** 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. | **Chapter 6 Ratio and Proportion**<br>6-7 Similarity—TE pp. 160–161B; SB pp. 160–161 / PB pp. 179–180<br>6-8 Indirect Measurement—TE pp. 162–163B; SB pp. 162–163 / PB pp. 181–182<br>**Chapter 7 Percent and Consumer Applications**<br>7-1 Percents—TE pp. 174–175B; SB pp. 174–175 / PB pp. 197–198<br>7-2 Fractions, Decimals, Percents—TE pp. 176–177B; SB pp. 176–177 / PB pp. 199–200<br>*continued* |

## STANDARD 1 – RATIO AND PROPORTIONAL RELATIONSHIP (RP)

| Grade 7 Standard & Benchmark Description | *Fundamentals of Algebra*, Grade 7 |
|---|---|
| **M.RP.7.1 Analyze proportional relationships and use them to solve real-world and mathematical problems.** | |
| | 7-4 Find a Percentage of a Number—TE pp. 180–181B; SB pp. 180–181 / PB pp. 203–204<br>7-5 Find a Percent—TE pp. 182–183B; SB pp. 182–183 / PB pp. 205–206<br>7-8 Percent Increase—TE pp. 188–189B; SB pp. 188–189 / PB pp. 211–212<br>7-9 Percent Decrease—TE pp. 190–191B; SB pp. 190–191 / PB pp. 213–214<br>7-9A Percent Error—Online<br>7-10 Sales Tax and Tips—TE pp. 192–193B; SB pp. 192–193 / PB pp. 215–216<br>7-11 Discount and Markup—TE pp. 194–195B; SB pp. 194–195 / PB pp. 217–218<br>7-12 Commission—TE pp. 196–197B; SB pp. 196–197 / PB pp. 219–220<br>7-13 Simple Interest—TE pp. 198–199B; SB pp. 198–199 / PB pp. 221–222<br>7-14 Compound Interest—TE pp. 200–201B; SB pp. 200–201 / PB pp. 223–224<br>**Chapter 11 Three-Dimensional Geometry**<br>11-11 Changing Dimensions of Three-Dimensional Figures—TE pp. 322–323B; SB pp. 322–323 / PB pp. 361–362 |

## STANDARD 2 – THE NUMBER SYSTEM (NS)

| Grade 7 Standard & Benchmark Description | *Fundamentals of Algebra*, Grade 7 |
|---|---|
| **M.NS.7.1 Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.** | |
| **M.NS.7.1.1** Represent addition and subtraction on a horizontal or vertical number line diagram. | **Chapter 1 Integers**<br>1-3 Add Integers—TE pp. 6–7B; SB pp. 6–7 / PB pp. 5–6<br>1-4 Subtract Integers—TE pp. 8–9B; SB pp. 8–9 / PB pp. 7–8 |

## STANDARD 2 – THE NUMBER SYSTEM (NS)

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|---|---|
| **M.NS.7.1 Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.** | |
| **M.NS.7.1.2** 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. | **Chapter 1 Integers**<br>1-1 Integers and Absolute Value—TE pp. 2–3B; SB pp. 2–3 / PB pp. 1–2<br>1-3 Add Integers—TE pp. 6–7B; SB pp. 6–7 / PB pp. 5–6<br>1-4 Subtract Integers—TE pp. 8–9B; SB pp. 8–9 / PB pp. 7–8<br>1-4B Understanding Integers—Online |
| **M.NS.7.1.3** 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 apposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. | **Chapter 1 Integers**<br>1-1 Integers and Absolute Value—TE pp. 2–3B; SB pp. 2–3 / PB pp. 1–2<br>1-3 Add Integers—TE pp. 6–7B; SB pp. 6–7 / PB pp. 5–6<br>1-4 Subtract Integers—TE pp. 8–9B; SB pp. 8–9 / PB pp. 7–8<br>1-7 Properties—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14 |
| **M.NS.7.1.4** Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. 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. | **Chapter 1 Integers**<br>1-4 Subtract Integers—TE pp. 8–9B; SB pp. 8–9 / PB pp. 7–8<br>1-4A Distance on a Number Line—Online<br>1-7 Properties—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14<br>**Chapter 4 Rational Numbers: Decimals**<br>4-5 Add and Subtract Decimals—TE pp. 80–81B; SB pp. 80–81 / PB pp. 91–92<br>**Chapter 5 Rational Numbers: Fractions**<br>5-6 Add and Subtract Fractions—TE pp. 118–119B; SB pp. 118–119 / PB pp. 133–134<br>5-7 Add and Subtract Mixed Numbers—TE pp. 120–121B; SB pp. 120–121 / PB pp. 135–136<br>5-7A Rational Numbers on a Number Line—Online |
| **M.NS.7.1.5** Apply properties of operations as strategies to add and subtract rational numbers. | **Chapter 1 Integers**<br>1-7 Properties—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14<br>1-8 Closure Property—TE pp. 16–17B; SB pp. 16–17 / PB pp. 15–16 |

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|---|---|
| **M.NS.7.1 Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.** | |
| | 1-10 Order of Operations—TE pp. 20–21B; SB pp. 20–21 / PB pp. 19–20<br>**Chapter 4 Rational Numbers: Decimals**<br>4-5 Add and Subtract Decimals—TE pp. 80–81B; SB pp. 80–81 / PB pp. 91–92<br>**Chapter 5 Rational Numbers: Fractions**<br>5-6 Add and Subtract Fractions—TE pp. 118–119B; SB pp. 118–119 / PB pp. 133–134<br>5-7 Add and Subtract Mixed Numbers—TE pp. 120–121B; SB pp. 120–121 / PB pp. 135–136<br>5-14 Addition and Subtraction Equations with Fractional Numbers—TE pp. 134–135B; SB pp. 134–135 / PB pp. 149–150 |
| **M.NS.7.1.6** 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. | **Chapter 1 Integers**<br>1-5 Multiply Integers—TE pp. 9–10B; SB pp. 10–11 / PB pp. 9–10<br>1-7 Properties—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14<br>**Chapter 4 Rational Numbers: Decimals**<br>4-6 Multiply Decimals—TE pp. 82–83B; SB pp. 82–83 / PB pp. 93–94<br>**Chapter 5 Rational Numbers: Fractions**<br>5-8 Multiply Fractions—TE pp. 122–123B; SB pp. 122–123 / PB pp. 137–138<br>5-9 Multiply Mixed Numbers—TE pp. 124–125B; SB pp. 124–125 / PB pp. 139–140<br>5-12 Properties of Rational Numbers—TE pp. 130–131B; SB pp. 130–131 / PB pp. 145–146<br>5-13 Order of Operations with Rational Numbers—TE pp. 132–133B; SB pp. 132–133 / PB pp. 147–148<br>5-13A Use Rational Numbers to Solve Problems—Online |
| **M.NS.7.1.7** Apply properties of operations as strategies to multiply and divide rational numbers. | **Chapter 1 Integers**<br>1-7 Properties—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14<br>1-9 Powers and Laws of Exponents—TE pp. 18–19B; SB pp. 18–19 / PB pp. 17–18 |

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|---|---|
| **M.NS.7.1 Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.** | |
| | 1-10 Order of Operations—TE pp. 20–21B; SB pp. 20–21 / PB pp. 19–20<br>**Chapter 4 Rational Numbers: Decimals**<br>4-7 Estimate Decimal Products and Quotients—TE pp. 84–85B; SB pp. 84–85 / PB pp. 95–96<br>4-8 Divide Decimals—TE pp. 86–87B; SB pp. 86–87 / PB pp. 97–98<br>**Chapter 5 Rational Numbers: Fractions**<br>5-8 Multiply Fractions—TE pp. 122–123B; SB pp. 122–123 / PB pp. 137–13<br>5-9 Multiply Mixed Numbers—TE pp. 124–125B; SB pp. 124–125 / PB pp. 139–140<br>5-10 Divide Fractions—TE pp. 126–127B; SB pp. 126–127 / PB pp. 141–142<br>5-11 Divide Mixed Numbers—TE pp. 128–129B; SB pp. 128–129 / PB pp. 143–144<br>5-15 Multiplication and Division Equations with Fractional Numbers—TE pp. 136–137B; SB pp. 136–137 / PB pp. 151–152<br>**Chapter 7 Percent and Consumer Applications**<br>7-2 Fractions, Decimals, Percents—TE pp. 176–177B; SB pp. 176–177 / PB pp. 199–200<br>7-3 Percents Greater Than 100% / Less Than 1%—TE pp. 178–179B; SB pp. 178–179 / PB pp. 201–202 |
| **M.NS.7.1.8** 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. | **Chapter 4 Rational Numbers: Decimals**<br>4-2 Equivalent Rational Numbers—TE pp. 74–75B; SB pp. 74–75 / PB pp. 85–86 |
| **M.NS.7.1.9** Solve real-world and mathematical problems involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions. | **Chapter 1 Integers**<br>1-3 Add Integers—TE pp. 6–7B; SB pp. 6–7 / PB pp. 5–6<br>1-4 Subtract Integers—TE pp. 8–9B; SB pp. 8–9 / PB pp. 7–8<br>1-5 Multiply Integers—TE pp. 9–10B; SB pp. 10–11 / PB pp. 9–10<br>1-6 Divide Integers—TE pp. 12–13B; SB pp. 12–13 / PB pp. 11–12<br>*continued* |

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|---|---|
| **M.NS.7.1 Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.** | |
| | 1-7 Properties—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14<br>1-8 Closure Property—TE pp. 16–17B; SB pp. 16–17 / PB pp. 15–16<br>1-10A Solve Real-World Problems with Operations and Properties—Online<br>1-12 Problem Solving Strategy: Guess and Test—TE pp. 24–25B; SB pp. 24–25 / PB pp. 23–24<br>**Chapter 4 Rational Numbers: Decimals**<br>4-5 Add and Subtract Decimals—TE pp. 80–81B; SB pp. 80–81 / PB pp. 91–92<br>4-6 Multiply Decimals—TE pp. 82–83B; SB pp. 82–83 / PB pp. 93–94<br>4-8 Divide Decimals—TE pp. 86–87B; SB pp. 86–87 / PB pp. 97–98<br>4-12 Addition and Subtraction Equations with Decimals—TE pp. 94–95B; SB pp. 94–95 / PB pp. 105–106<br>4-13 Multiplication and Division Equations with Decimals—TE pp. 96–97B; SB pp. 96–97 / PB pp. 107–108<br>4-14 Solve Two-Step Equations with Decimals—TE pp. 98–99B; SB pp. 98–99 / PB pp. 109–110<br>**Chapter 5 Rational Numbers: Fractions**<br>5-6 Add and Subtract Fractions—TE pp. 118–119B; SB pp. 118–119 / PB pp. 133–134<br>5-7 Add and Subtract Mixed Numbers—TE pp. 120–121B; SB pp. 120–121 / PB pp. 135–136<br>5-8 Multiply Fractions—TE pp. 122–123B; SB pp. 122–123 / PB pp. 137–13<br>5-9 Multiply Mixed Numbers—TE pp. 124–125B; SB pp. 124–125 / PB pp. 139–140<br>5-10 Divide Fractions—TE pp. 126–127B; SB pp. 126–127 / PB pp. 141–142<br>5-11 Divide Mixed Numbers—TE pp. 128–129B; SB pp. 128–129 / PB pp. 143–144<br>5-12 Properties of Rational Numbers—TE pp. 130–131B; SB pp. 130–131 / PB pp. 145–146<br>5-14 Addition and Subtraction Equations with Fractional Numbers—TE pp. 134–135B; SB pp. 134–135 / PB pp. 149–150<br>*continued* |

## STANDARD 2 – THE NUMBER SYSTEM (NS)

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|---|---|
| **M.NS.7.1 Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.** | |
| | 5-15 Multiplication and Division Equations with Fractional Numbers—TE pp. 136–137B; SB pp. 136–137 / PB pp. 151–152<br>5-16 Solve Two-Step Equations with Fractions—TE pp. 138–139B; SB pp. 138–139 / PB pp. 153–154 |

## STANDARD 3 – EXPRESSIONS AND EQUATIONS (EE)

| Grade 7 Standard & Benchmark Description | *Fundamentals of Algebra*, Grade 7 |
|---|---|
| **M.EE.7.1 Use properties of operations to generate equivalent expressions.** | |
| **M.EE.7.1.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. | **Chapter 2 Expressions and Equations**<br>2-2 Simplify and Evaluate Algebraic Expressions—TE pp. 32–33B; SB pp. 32–33 / PB pp. 35–36<br>**Chapter 5 Rational Numbers: Fractions**<br>5-13B Combining Like Terms—Online<br>5-13C Factoring and Expanding Linear Expressions—Online<br>**Chapter 14 Polynomials, Equations, and Inequalities**<br>14-3 Add Polynomials—TE pp. 386–387B; SB pp. 386–387 / PB pp. 437–438<br>14-4 Subtract Polynomials—TE pp. 388–389B; SB pp. 388–389 / PB pp. 439–440<br>14-5 Multiply and Divide Monomials—TE pp. 390–391B; SB pp. 390–391 / PB pp. 441–442<br>14-6 Multiply Polynomials by Monomials—TE pp. 392–393B; SB pp. 392–393 / PB pp. 443–444<br>14-7 Divide Polynomials by Monomials—TE pp. 394–395B; SB pp. 394–395 / PB pp. 445–446<br>14-8 Solve Multistep Equations—TE pp. 396–397B; SB pp. 396–397 / PB pp. 447–448 |

## STANDARD 3 – EXPRESSIONS AND EQUATIONS (EE)

| Grade 7 Standard & Benchmark Description | *Fundamentals of Algebra*, Grade 7 |
|---|---|
| **M.EE.7.1 Use properties of operations to generate equivalent expressions.** | |
| **M.EE.7.1.2** In a problem context, understand that rewriting an expression in an equivalent form can reveal and explain properties of the quantities represented by the expression and can reveal how those quantities are related. For example, a discount of 15% (represented by $p$ – 0.15)$p$, which is equivalent to 0.85$p$ or finding 85% of the original price. | **Chapter 2 Expressions and Equations**<br>2-1 Mathematical Expressions—TE pp. 30–31B; SB pp. 30–31 / PB pp. 33–34<br>**Chapter 7 Percent and Consumer Application**<br>7-11A Equivalent Expressions for Percents—Online<br>**Chapter 11 Three-Dimensional Geometry**<br>11-10A Write Expressions in Different Ways—Online |
| **M.EE.7.2 Solve real-life and mathematical problems using numerical and algebraic expressions and equations.** | |
| **M.EE.7.2.1** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers if any form (whole numbers, fractions, and decimals), using tools strategically.<br>**M.EE.7.2.2** Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computations 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 a raise of $2.50, for a new salary of $27.50 an hour. | **Chapter 1 Integers**<br>1-3 Add Integers—TE pp. 6–7B; SB pp. 6–7 / PB pp. 5–6<br>1-4 Subtract Integers—TE pp. 8–9B; SB pp. 8–9 / PB pp. 7–8<br>1-5 Multiply Integers—TE pp. 9–10B; SB pp. 10–11 / PB pp. 9–10<br>1-6 Divide Integers—TE pp. 12–13B; SB pp. 12–13 / PB pp. 11–12<br>1-7 Properties—TE pp. 14–15B; SB pp. 14–15 / PB pp. 13–14<br>1-8 Closure Property—TE pp. 16–17B; SB pp. 16–17 / PB pp. 15–16<br>1-10A Solve Real-World Problems with Operations and Properties—Online<br>1-12 Problem Solving Strategy: Guess and Test—TE pp. 24–25B; SB pp. 24–25 / PB pp. 23–24<br>**Chapter 3 Inequalities**<br>3-7 Problem Solving Strategy: Find a Pattern—TE pp. pp. 66–67B; SB pp. 66–67 / PB pp. 73–74<br>**Chapter 4 Rational Numbers: Decimals**<br>4-5 Add and Subtract Decimals—TE pp. 80–81B; SB pp. 80–81 / PB pp. 91–92<br>4-6 Multiply Decimals—TE pp. 82–83B; SB pp. 82–83 / PB pp. 93–94<br>4-8 Divide Decimals—TE pp. 86–87B; SB pp. 86–87 / PB pp. 97–98<br>*continued* |

## STANDARD 3 – EXPRESSIONS AND EQUATIONS (EE)

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|---|---|
| **M.EE.7.2 Solve real-life and mathematical problems using numerical and algebraic expressions and equations.** | |
| | 4-12 Addition and Subtraction Equations with Decimals—TE pp. 94–95B; SB pp. 94–95 / PB pp. 105–106<br>4-13 Multiplication and Division Equations with Decimals—TE pp. 96–97B; SB pp. 96–97 / PB pp. 107–108<br>4-14 Solve Two-Step Equations with Decimals—TE pp. 98–99B; SB pp. 98–99 / PB pp. 109–110<br>**Chapter 5 Rational Numbers: Fractions**<br>5-6 Add and Subtract Fractions—TE pp. 118–119B; SB pp. 118–119 / PB pp. 133–134<br>5-7 Add and Subtract Mixed Numbers—TE pp. 120–121B; SB pp. 120–121 / PB pp. 135–136<br>5-8 Multiply Fractions—TE pp. 122–123B; SB pp. 122–123 / PB pp. 137–13<br>5-9 Multiply Mixed Numbers—TE pp. 124–125B; SB pp. 124–125 / PB pp. 139–140<br>5-10 Divide Fractions—TE pp. 126–127B; SB pp. 126–127 / PB pp. 141–142<br>5-11 Divide Mixed Numbers—TE pp. 128–129B; SB pp. 128–129 / PB pp. 143–144<br>5-12 Properties of Rational Numbers—TE pp. 130–131B; SB pp. 130–131 / PB pp. 145–146<br>5-14 Addition and Subtraction Equations with Fractional Numbers—TE pp. 134–135B; SB pp. 134–135 / PB pp. 149–150<br>5-15 Multiplication and Division Equations with Fractional Numbers—TE pp. 136–137B; SB pp. 136–137 / PB pp. 151–152<br>5-16 Solve Two-Step Equations with Fractions—TE pp. 138–139B; SB pp. 138–139 / PB pp. 153–154 |
| **M.EE.7.2.3** Use variable to represent quantities in a real-world or mathematical problem and construct simple equations and inequalities to solve problems by reasoning about the quantities. | **Chapter 2 Expressions and Equations**<br>2-3 Equations—TE pp. 34–35B; SB pp. 34–35 / PB pp. 37–38<br>2-4 Solve Addition Equations—TE pp. 36–37B; SB pp. 36–37 / PB pp. 39–40<br>2-5 Solve Subtraction Equations—TE pp. 38–39B; SB pp. 38–39 / PB pp. 41–42<br>2-6 Solve Multiplication Equations—TE pp. 40–41B; SB pp. 40–41 / PB pp. 43–44<br>*continued* |

## STANDARD 3 – EXPRESSIONS AND EQUATIONS (EE)

| Grade 7 Standard & Benchmark Description | *Fundamentals of Algebra*, Grade 7 |
|---|---|
| **M.EE.7.2 Solve real-life and mathematical problems using numerical and algebraic expressions and equations.** | |
| | 2-7 Solve Division Equations—TE pp. 42–43B; SB pp. 42–43 / PB pp. 45–46<br>2-8 Solve Two-Step Equations—TE pp. 44–45B; SB pp. 44–45 / PB pp. 47–48<br>2-8A Solving Equations of the Form a(x + b) = c Using Integers—Online<br>**Chapter 4 Rational Numbers: Decimals**<br>4-14 Solve Two-Step Equations with Decimals—TE pp. 98–99B; SB pp. 98–99 / PB pp. 109–110<br>4-14A Solving Equations of the Form a(x + b) = c Using Decimals—Online<br>**Chapter 5 Rational Numbers: Fractions**<br>5-11A Different Ways to Solve Problems with Rational Numbers—Online<br>5-16 Solve Two-Step Equations with Fractions—TE pp. 138–139B; SB pp. 138–139 / PB pp. 153–154<br>5-16A Solving Equations of the Form a(x + b) = c Using Fractions—Online |
| **M.EE.7.2.4** 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. | **Chapter 2 Expressions and Equations**<br>2-3 Equations—TE pp. 34–35B; SB pp. 34–35 / PB pp. 37–38<br>2-4 Solve Addition Equations—TE pp. 36–37B; SB pp. 36–37 / PB pp. 39–40<br>2-5 Solve Subtraction Equations—TE pp. 38–39B; SB pp. 38–39 / PB pp. 41–42<br>2-6 Solve Multiplication Equations—TE pp. 40–41B; SB pp. 40–41 / PB pp. 43–44<br>2-7 Solve Division Equations—TE pp. 42–43B; SB pp. 42–43 / PB pp. 45–46<br>2-8 Solve Two-Step Equations—TE pp. 44–45B; SB pp. 44–45 / PB pp. 47–48<br>2-8A Solving Equations of the Form a(x + b) = c Using Integers—Online<br>**Chapter 4 Rational Numbers: Decimals**<br>4-14 Solve Two-Step Equations with Decimals—TE pp. 98–99B; SB pp. 98–99 / PB pp. 109–110<br>4-14A Solving Equations of the Form a(x + b) = c Using Decimals—Online<br>*continued* |

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| Grade 7 Standard & Benchmark Description | *Fundamentals of Algebra*, Grade 7 |
|---|---|
| **M.EE.7.2 Solve real-life and mathematical problems using numerical and algebraic expressions and equations.** | |
| | **Chapter 5 Rational Numbers: Fractions**<br>5-11A Different Ways to Solve Problems with Rational Numbers—Online<br>5-16 Solve Two-Step Equations with Fractions—TE pp. 138–139B; SB pp. 138–139 / PB pp. 153–154<br>5-16A Solving Equations of the Form a(x + b) = c Using Fractions—Online |
| **M.EE.7.2.5** Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width? | **Chapter 2 Expressions and Equations**<br>2-9A Compare Arithmetic and Algebraic Problem-Solving Methods—Online |
| **M.EE.7.2.6** Solve world problems leading to inequalities of the form $px + q \geq r$ or $px + q \leq r$, 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 solution. | **Chapter 3 Inequalities**<br>3-1 Inequalities—TE pp. 54–55B; SB pp. 54–55 / PB pp. 61–62<br>3-4 Solve Inequalities Using Addition and Subtraction—TE pp. 60–61B; SB pp. 60–61 / PB pp. 67–68<br>3-5 Solve Inequalities Using Multiplication—TE pp. 62–63B; SB pp. 62–63 / PB pp. 69–70<br>3-6 Solve Inequalities Using Division—TE pp. 64–65B;SB pp. 64–65 / PB pp. 71–72<br>3-6A Solve Two-Step Inequalities—Online<br>**Chapter 14 Polynomials, Equations, and Inequalities**<br>14-9 Addition and Subtraction: Inequalities with Rational Numbers—TE pp. 398–399B; SB pp. 398–399 / PB pp. 449–450<br>14-10 Multiplication and Division: Inequalities with Rational Numbers—TE pp. 400–401B; SB pp. 400–401 / PB pp. 451–452 |

## STANDARD 4 – GEOMETRY (G)

| Grade 7 Standard & Benchmark Description | *Fundamentals of Algebra*, Grade 7 |
|---|---|
| **M.G.7.1 Draw, construct, and describe geometrical figures and describe the relationship between them.** | |
| **M.G.7.1.1** Solve problems involving similar figures with right triangles, other triangles, and special quadrilaterals. | **Chapter 6 Ratio and Proportion**<br>6-6 Scale Drawings and Models—TE pp. 158–159B; SB pp. 158–159 / PB pp. 177–178<br>**Chapter 10 Two-Dimensional Geometry and Measurement Applications**<br>10-5 Pythagorean Theorem—TE pp. 280–281B; SB pp. 280–281 / PB pp. 315–316 |
| **M.G.7.1.2** Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. | **Chapter 11 Three-Dimensional Geometry**<br>11-7 Volume of Prisms—TE pp. 314–315B; SB pp. 314–315 / PB pp. 353–354 |
| **M.G.7.1.3** Compute actual lengths and areas from a scale drawing and reproduce a scale drawing at a different scale. | **Chapter 6 Ratio and Proportion**<br>6-6 Scale Drawings and Models—TE pp. 158–159B; SB pp. 158–159 / PB pp. 177–178 |
| **M.G.7.1.4** Draw (freehand with ruler and protractor, and with technology) geometric figures with given conditions. | **Chapter 9 Two-Dimensional Geometry**<br>9-7 Polygons—TE pp. 252–253B; SB pp. 252–253 / PB pp. 283–284<br>9-9 Congruent Triangles—TE pp. 256–257B; SB pp. 256–257 / PB pp. 287–288<br>9-10 Triangle Constructions—TE pp. 258–259B; SB pp. 258–259 / PB pp. 289–290 |
| **M.G.7.1.5** 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. | **Chapter 9 Two-Dimensional Geometry**<br>9-9 Congruent Triangles—TE pp. 256–257B; SB pp. 256–257 / PB pp. 287–288<br>9-10 Triangle Constructions—TE pp. 258–259B; SB pp. 258–259 / PB pp. 289–290 |
| **M.G.7.1.6** Focus on constructing quadrilaterals with given conditions noticing types and properties of resulting quadrilaterals and whether it is possible to construct different quadrilaterals using the same conditions. | **Chapter 9 Two-Dimensional Geometry**<br>9-11 Quadrilaterals—TE pp. 260–261B; SB pp. 260–261 / PB pp. 291–292 |

## STANDARD 4 – GEOMETRY (G)

| Grade 7 Standard & Benchmark Description | *Fundamentals of Algebra*, Grade 7 |
|---|---|
| **M.G.7.1 Draw, construct, and describe geometrical figures and describe the relationship between them.** | |
| **M.G.7.1.7** Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular. | **Chapter 11 Three-Dimensional Geometry**<br>11-1 Three-Dimensional Figures—TE pp. 302–303B; SB pp. 302–303 / PB pp. 341–342<br>11-2 Draw Three-Dimensional Figures—TE pp. 304–305B; SB pp. 304–305 / PB pp. 343–344<br>11-2A Draw Three-Dimensional Figures—Online<br>11-5 Surface Area of Cylinders and Cones—TE pp. 310–311B; SB pp. 310–311 / PB pp. 349–350 |
| **M.G.7.2 Solve real-life and mathematical problems involving angle measure, area, circles, surface area, and volume.** | |
| **M.G.7.2.1** Work with circles. Explore and understand the relationships among the circumference, diameter, area, and radius of a circle. | **Chapter 9 Two-Dimensional Geometry**<br>9-12 Circles—TE pp. 262–263B; SB pp. 262–263 / PB pp. 293–294<br>9-14 Problem Solving Strategy: Adopt a Different Point of View—TE pp. 266–267B; SB pp. 266–267 / PB pp. 297–298 |
| **M.G.7.2.2** Know and use the formulas for the area and circumference of a circle and use them to solve real-world and mathematical problems. | **Chapter 10 Two-Dimensional Geometry and Measurement Applications**<br>10-8 Circumference and Area of a Circle—TE pp. 286–287B; SB pp. 286–287 / PB pp. 321–322 |
| **M.G.7.2.3** 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. | **Chapter 9 Two-Dimensional Geometry**<br>9-3 Angle Pairs—TE pp. 244–245B; SB pp. 244–245 / PB pp. 275–276 |
| **M.G.7.2.4** Solve real-world and mathematical problems involving area, volume, and surface area of two-and-three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. | **Chapter 2 Expressions and Equations**<br>2-3 Equations—TE pp. 34–35B; SB pp. 34–35 / PB pp. 37–38<br>**Chapter 9 Two-Dimensional Geometry**<br>9-14 Problem Solving Strategy: Adopt a Different Point of View—TE pp. 266–267B; SB pp. 266–267 / PB pp. 297–298<br>*continued* |

## STANDARD 4 – GEOMETRY (G)

| Grade 7 Standard & Benchmark Description | *Fundamentals of Algebra*, Grade 7 |
|---|---|
| **M.G.7.2 Solve real-life and mathematical problems involving angle measure, area, circles, surface area, and volume.** | |
| | **Chapter 10 Two-Dimensional Geometry and Measurement Applications**<br>10-6 Area of Parallelograms—TE pp. 282–283B; SB pp. 282–283 / PB pp. 317–318<br>10-7 Area of Triangles and Trapezoids—TE pp. 284–285B; SB pp. 284–285 / PB pp. 319–320<br>10-9 Area of Complex Figures—TE pp. 288–289B; SB pp. 288–289 / PB pp. 323–324<br>**Chapter 11 Three-Dimensional Geometry**<br>11-3 Surface Area of Prisms—TE pp. 306–307B; SB pp. 306–307 / PB pp. 345–346<br>11-4 Surface Area of Pyramids—TE pp. 308–309B; SB pp. 308–309 / PB pp. 347–348<br>11-6 Estimate Surface Area—TE pp. 312–313B; SB pp. 312–313 / PB pp. 351–352<br>11-7 Volume of Prisms—TE pp. 314–315B; SB pp. 314–315 / PB pp. 353–354 |

## STANDARD 5 – STATISTICS AND PROBABILITY (SP)

| Grade 7 Standard & Benchmark Description | *Fundamentals of Algebra*, Grade 7 |
|---|---|
| **M.SP.7.1 Use sampling to draw conclusions about a population.** | |
| **M.SP.7.1.1** Understand that statistics can be used to gain information about population by examining a sample of the population. | **Chapter 8 Data Analysis and Statistics**<br>8-1 Samples and Surveys—TE pp. 208–209B; SB pp. 208–209 / PB pp. 235–236 |
| **M.SP.7.1.2** Differentiate between a sample and a population. | **Chapter 8 Data Analysis and Statistics**<br>8-1 Samples and Surveys—TE pp. 208–209B; SB pp. 208–209 / PB pp. 235–236<br>8-1A Use Samples to Make Predictions—Online |
| **M.SP.7.1.3** Understand that conclusions and generalizations about a population are valid only if the sample is representative of that populations. Develop an informal understanding of bias. | **Chapter 8 Data Analysis and Statistics**<br>8-1 Samples and Surveys (representative samples/bias)—TE pp. 208–209B; SB pp. 208–209 / PB pp. 235–236 |

## STANDARD 5 – STATISTICS AND PROBABILITY (SP)

| Grade 7 Standard & Benchmark Description | *Fundamentals of Algebra*, Grade 7 |
|---|---|
| **M.SP.7.2 Broaden understanding of statistical problem solving.** | |
| **M.SP.7.2.1** Use random sampling to broaden understanding of statistical problems solving by using GAISE model. | **Chapter 8 Data Analysis and Statistics**<br>8-1 Samples and Surveys (random v. convenience samples)—TE pp. 208–209B; SB pp. 208–209 / PB pp. 235–236 |
| **M.SP.7.2.2** Formulate Questions: Recognize and formulate a statistical question as one that anticipates variability and can be answered with quantitative data. For example, "How do the heights of seventh graders compare to the heights of eighth graders?" (GAISE Model Step 1) | **Chapter 8 Data Analysis and Statistics**<br>8-1A Use Samples to Make Predictions—Online<br>8-8A Variability—Online |
| **M.SP.7.2.3** Collect Data: Design and use a plan to collect appropriate data to answer a statistical question. (GAISE Model Step 2) | **Chapter 8 Data Analysis and Statistics**<br>8-1 Samples and Surveys—TE pp. 208–209B; SB pp. 208–209 / PB pp. 235–236 |
| **M.SP.7.2.4** Analyze Data: Select appropriate graphical methods and numerical measures to analyze data by displaying variability within a group, comparing individual to individual, and comparing individual to group. (GAISE Model Step 3) | **Chapter 8 Data Analysis and Statistics**<br>8-4 Choose an Appropriate Graph—TE pp. 214–215B; SB pp. 214–215 / PB pp. 241–242<br>8-5 Multiple Bar Graphs—TE pp. 216–217B; SB pp. 216–217 / PB pp. 243–244<br>8-6 Histograms—TE pp. 218–219B; SB pp. 218–219 / PB pp. 245–246<br>8-7 Stem-and-Leaf Plots—TE pp. 220–221B; SB pp. 220–221 / PB pp. 247–248<br>8-8 Box-and-Whisker Plots—TE pp. 222–223B; SB pp. 222–223 / PB pp. 249–250<br>8-8A Variability—Online<br>8-8B Mean Absolute Deviation—Online<br>8-9 Venn Diagrams—TE pp. 224–225B; SB pp. 224–225 / PB pp. 251–252<br>8-10 Multiple Line Graphs—TE pp. 226–227B; SB pp. 226–227 / PB pp. 253–254<br>8-11 Scatter Plots—TE pp. 228–229B; SB pp. 228–229 / PB pp. 255–256 |

## STANDARD 5 – STATISTICS AND PROBABILITY (SP)

| Grade 7 Standard & Benchmark Description | *Fundamentals of Algebra*, Grade 7 |
|---|---|
| **M.SP.7.2 Broaden understanding of statistical problem solving.** | |
| **M.SP.7.2.5** Interpret Results: Draw logical conclusions and make generalizations. (GAISE Model Step 4) | **Chapter 8 Data Analysis and Statistics**<br>8-1 Samples and Surveys (representative sample)—TE pp. 208–209B; SB pp. 208–209 / PB pp. 235–236<br>8-1A Use Samples to Make Predictions (compare predictions with results)—Online<br>8-2 Measures of Central Tendency and Range—TE pp. 210–211B; SB pp. 210–211 / PB pp. 237–238<br>8-3 Interpret Data—TE pp. 212–213B; SB pp. 212–213 / PB pp. 239–240<br>8-8A Variability—Online<br>8-8C Comparing Data Sets—Online<br>8-12 Misleading Statistics and Graphs—TE pp. 230–231B; SB pp. 230–231 / PB pp. 257–258 |
| **M.SP.7.3 Draw informal comparative inferences about two populations.** | |
| **M.SP.7.3.1** Summarize and describe distributions representing one population and draw informal comparisons between two populations. | **Chapter 8 Data Analysis and Statistics**<br>8-8A Variability—Online |
| **M.SP.7.3.2** Describe and analyze distributions: Summarize quantitative data sets in relation to their context by using mean absolute deviation (MAO), interpreting as a balance point. | **Chapter 8 Data Analysis and Statistics**<br>8-8A Variability—Online<br>8-8B Mean Absolute Deviation—Online |
| **M.SP.7.3.3** Informally assess the degree of visual overlap of two numerical data distributions with roughly equal 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 a basketball team is 10 cm. greater than the mean height of players on a soccer team, about twice the variability (MAD) on either team on a dot line (plot line, the separation between the two distributions of heights is noticeable. | **Chapter 8 Data Analysis and Statistics**<br>8-8A Variability—Online<br>8-8B Mean Absolute Deviation—Online |

## STANDARD 5 – STATISTICS AND PROBABILITY (SP)

| Grade 7 Standard & Benchmark Description | *Fundamentals of Algebra*, Grade 7 |
|---|---|
| **M.SP.7.4 Investigate chance processes and develop use, and evaluate probability models.** | |
| **M.SP.7.4.1** 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. | **Chapter 12 Probability**<br>12-1 Sample Space—TE pp. 330–331B; SB pp. 330–331 / PB pp. 373–374<br>12-3 Theoretical Probability—TE pp. 334–335B; SB pp. 334–335 / PB pp. 377–378 |
| **M.SP.7.4.2** A probability near 0 indicates an unlikely event.<br>**M.SP.7.4.3** A probability around ½ indicates an event that is neither unlikely more likely.<br>**M.SP.7.4.4** A probability near 1 indicates a likely event. | **Chapter 12 Probability**<br>12-3 Theoretical Probability—TE pp. 334–335B; SB pp. 334–335 / PB pp. 377–378 |
| **M.SP.7.4.5** 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 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. | **Chapter 12 Probability**<br>8-1A Use Samples to Make Predictions—Online<br>**Chapter 12 Probability**<br>12-4 Experimental Probability—TE pp. 336–337B; SB pp. 336–337 / PB pp. 379–380 |
| **M.SP.7.4.6** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observe frequencies; if the agreement is not good, explain possible sources of the discrepancy. | **Chapter 12 Probability**<br>8-1A Use Samples to Make Predictions—Online<br>**Chapter 12 Probability**<br>12-4 Experimental Probability—TE pp. 336–337B; SB pp. 336–337 / PB pp. 379–380 |
| **M.SP.7.4.7** 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. | **Chapter 12 Probability**<br>12-4 Experimental Probability—TE pp. 336–337B; SB pp. 336–337 / PB pp. 379–380 |

## STANDARD 5 – STATISTICS AND PROBABILITY (SP)

| Grade 7 Standard & Benchmark Description | *Fundamentals of Algebra*, Grade 7 |
|---|---|
| **M.SP.7.4 Investigate chance processes and develop use, and evaluate probability models.** | |
| **M.SP.7.4.8** 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? | **Chapter 8 Data Analysis and Statistics**<br>8-1A Use Samples to Make Predictions—Online |
| **M.SP.7.4.9** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. | **Chapter 12 Probability**<br>12-1 Sample Space—TE pp. 330–331B; SB pp. 330–331 / PB pp. 373–374<br>12-2 Fundamental Counting Principle and Factorials—TE pp. 332–333B; SB pp. 332–333 / PB pp. 375–376<br>12-6 Compound Events—TE pp. 340–341B; SB pp. 340–341 / PB pp. 383–384<br>12-6A Design a Simulation—Online<br>12-7 Permutations—TE pp. 342–343B; SB pp. 342–343 / PB pp. 385–386<br>12-8 Combinations—TE pp. 344–345B; SB pp. 344–345 / PB pp. 387–388 |
| **M.SP.7.4.10** 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. | **Chapter 12 Probability**<br>12-6 Compound Events—TE pp. 340–341B; SB pp. 340–341 / PB pp. 383–384 |
| **M.SP.7.4.11** Represent sample space for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language. For example, "rolling double sixes" identify the outcomes in the sample space which compose the event. | **Chapter 10 Two-Dimensional Geometry and Measurement Applications**<br>10-13 Problem Solving Strategy: Account for All Possibilities—TE pp. 296–297B; SB pp. 296–297 / PB pp. 331–332<br>**Chapter 12 Probability**<br>12-2 Fundamental Counting Principle and Factorials—TE pp. 332–333B; SB pp. 332–333 / PB pp. 375–376<br>12-4 Experimental Probability—TE pp. 336–337B; SB pp. 336–337 / PB pp. 379–380<br>12-6 Compound Events—TE pp. 340–341B; SB pp. 340–341 / PB pp. 383–384 |

## STANDARD 5 – STATISTICS AND PROBABILITY (SP)

| Grade 7 Standard & Benchmark Description | *Fundamentals of Algebra*, Grade 7 |
|---|---|
| **M.SP.7.4 Investigate chance processes and develop use, and evaluate probability models.** | |
| **M.SP.7.4.12** 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? | **Chapter 12 Probability**<br>12-6A Design a Simulation—Online |