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Correlations of

Mathematics in Context®

to

Common Core State Standards for Mathematics

Grades 6, 7, and 8

COMMON CORE STATE STANDARDS FOR MATHEMATICS

Correlated to Mathematics in Context® (MiC)

The cited unit and pages are specific examples of coverage within an MiC unit. The curriculum design and realistic contexts of MiC support the Practice Standards in every lesson and every unit.

Grade	Number	STANDARDS FOR MATHEMATICAL PRACTICE	MiC Unit and Pages
6	**1**	**Make sense of problems and persevere in solving them.**	
		Mathematics in Context provides the opportunity for students to begin from their intuitive informal knowledge and proceed carefully to a deeper, more formal conceptual understanding. The use of "thinking tools" enable students to make sense of the mathematics, to solve problems, and persevere to a solution. When a challenging problem is posed, students have the opportunity to construct, design, and find different strategies to solve it.	Dealing With Data pp.34-45 Models You Can Count On, pp. 50-60, 65, 73-74;
6	**2**	**Reason abstractly and quantitatively.**	
		The use of the ratio table and double number line allow students to make accurate calculations and estimates for all sorts of ratio problems especially where real numbers are involved. These "thinking tools" help students to monitor and assess their progress, even considering other alternatives if necessary. Models help students learn mathematics of different levels of abstraction from the concrete world of real-life problems tend the abstract world of mathematical knowledge.	Operations pp. 22-35; Models You Can Count On, pp.13-23, 40-49
6	**3**	**Construct viable arguments and critique the reasoning of others.**	
		As the students progress through the investigations, a fictional student's thinking is part of the questioning process. The student's strategy is used to build knowledge, develop a deeper level of thinking, or require higher levels of thinking.	Dealing With Data pp. 28-33; Operations pp. 48-51
6	**4**	**Model with mathematics.**	
		MiC help students become aware of mathematical phenomena in their surroundings. Real world offers many contexts for development of important mathematical concepts and skills.	Expressions and Formulas pp. 14-17;Fraction Times pp. 35-39
6	**5**	**Use appropriate tools strategically.**	
		Students are given opportunities to solve realistic problems using strategies that make sense to them. Students are encouraged to choose the models, technology, and the language of mathematics to help with the "sense making." Tool selection and interaction is an integral part of this process. The Teacher's Guides have multiple references to help students	Models You Can Count On p. 55 - 55T
6	**6**	**Attend to precision.**	
		Students use a "thinking tool" called arrow language to describe any sequence of multiple computations. This helps to prevent the misuse of the equals sign as well as to build the foundation for algebraic notation.	Reallotment pp. 13-24; Expressions and Formulas pp. 2-5

6	**7**	**Look for and make use of structure.**	
		Students construct knowledge by starting with engaging questions and an investigation. As they discover patterns and test conjectures, they begin to create rules to define the mathematical structure. The summary section of the lesson helps the student communicate their learning.	Reallotment pp. 51-58; Operations pp. 38-43
6	**8**	**Look for and express regularity in repeated reasoning.**	
		The tools used in MiC, help student develop mental math strategies for many computations. Initially a paper/pencil task, later just a notation for the mental math. Because students share their strategies and solutions, often a student will embrace others thinking that demonstrated a more efficient way to solve the problem. Students may choose others more abstract strategies after they developed an understanding using a concrete model.	Reallotment pp. 30 - 33; Fraction Times pp. 43-49
		STANDARDS FOR MATHEMATICAL CONTENT	
	6.RP	**Ratios and Proportional Relationships**	
		Understand ratio concepts and use ratio reasoning to solve problems.	
6	1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak. "For every vote candidate A received, candidate C received nearly three votes."	Models You Can Count On pp. 1-12, 40-49, 52-61, 65-66
6	2	Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."	Models You Can Count On pp. 7-12,55-61, 66
6	3	Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.	Models You Can Count On pp. 1 - 12; Expressions and Formulas pp. 12-24, 47, 53-54
		a.) Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.	Models You Can Count On pp. 1-12, 61, 66; Companion Workbook (6) pp. 11-12, 19-20, 29-30
		b.) Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rates were lawns being mowed?*	Expressions and Formulas pp. 12-15, 47, 52-53; Companion Practice Workbook (6) pp.29-30
		c.) Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and a percent.	Models You Can Count On pp. 18- 25, 62, 68-69; Take a Chance pp. 13-15, 16-19;Fraction Times pp. 23-42, 49-50, 55-57
	6.NS	**The Number System**	
		Apply and extend previous understandings of multiplication and division to divided fractions by fractions.	

6	2	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for (2/3) ÷ (3/4) and visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/by) How much chocolate will each person get if 3 people share 1/2 lb. of chocolate equally? How many 3/4 -cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?	Models You Can Count On pp. 3-9, 46, 48-49; Companion Workbook (6) pp. 61-63
		Compute fluently with multi-digit numbers and find common factors and multiples.	
6	3	Fluently divide multi-digit numbers using the standard algorithm.	*Addendum
6	4	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	Companion Workbook (6) pp. 64-66
6	5	Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1 - 100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4(9 + 2)*	Facts and Factors, pp. 13-33, 54-56, 61-63
		Apply and extend previous understandings of numbers to the system of rational numbers.	
6	6	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric change); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.	Operations pp. 1 - 13, 52-53, 58-59
		Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.	Operations pp. 12 -21, 46-47, 50-51
		a.) Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself; e.g., -(-3) = 3, and that 0 is its own opposite.	Operations pp. 16-17
		b.) Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only in signs, the location points are related by reflections across one or both axes.	Operations pp. 46-51
		c.) Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.	Operations pp. 6-15, 46-47
6	7	Understand ordering and absolute value of rational numbers.	
		a.) Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret -3 > 7 as a statement that -3 is located to the right of -7 on a number line oriented from left to right.*	Operations pp. 14 - 15, 20 -21
		b.) Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write -3° C > -7° C to express the fact that -3° C is warmer than -7° C*	Operations pp. 6 - 15, 20-21

		c.) Understand the absolute value of a rational number is the distance from 0 on the number line; interpret absolute value as magnitude from a positive or negative quantity in a real-world situation. *For example, for an account balance of -30 dollars, write* $|-30| = 30$ *to describe the size of the debt in dollars.*	*Addendum
		d.) Distinguish comparison of absolute value from statements about order. *For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.*	Operations, pp. 6 -13, 52-53, 58-59
6	8	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	Operations pp. 46 - 51
	6.EE	**Expressions and Equations**	
		Apply and extend previous understanding of arithmetic to algebraic expressions.	
6	1	Write and evaluate numerical expressions involving whole-number exponents.	Companion Workbook, pp. 93-95
6	2	Write, read, and evaluate expressions in which letters stand for numbers.	
		a.) Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as 5-y.	Expressions and Formulas
		b.) Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2(8 + 7) as both a single entity and a sum of two terms.*	Mathematical Vocabulary used throughout the curriculum and referenced in both the teacher's guide and student editions
		c.) Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real world problem. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations.) *For example,* $V = s^3$ *and* $A = 6s^2$ *to find volume and surface area of a cube with sides of length s = 1/2.*	Reallotment pp. 20-24
6	3	Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3(2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6(4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*	Expressions and Formulas pp. 42-45
6	4	Identify when two expressions are equivalent (i.e., when two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y+ y+y and 3y are equivalent because they name the same number regardless of which number y stands for.*	Expressions and Formulas pp. 34-40
		Reason about and solve one-variable equations and inequalities.	
6	5	Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes and equation or inequality true.	Companion Workbook (6) pp. 38 - 40
6	6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	Expressions and Formulas pp. 12-24, 47-48, 62-63

6	7	Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which *p, q,* and x are all nonnegative rational numbers.	Expressions and Formulas pp. 12-24, 47-48, 62-63;Companion Workbook (6), pp.38-40
6	8	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ *or* $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	Companion Workbook (7), pp. 43- 45
		Represent and analyze quantitative relationships between dependent and independent variables.	
6	9	Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.*	Expressions and Formulas pp 12-24, 47-48, 62-63
	6.G	**Geometry**	
		Solve real-world and mathematical problems involving area, surface area, and volume.	
6	1	Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.	Reallotment pp. 13 - 24, 65, 67- 77
6	2	Find the volume of a right rectangular prism with fraction edge lengths by packing it with unit cubes of appropriate unit fraction edge lengths, and show that the volume is the same as would by found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	Reallotment pp. 49 - 63, 67-69, 75-78,
6	3	Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.	Operations pp. 46 - 51
6	4	Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures, Apply these techniques in the context of solving real-world and mathematical problems.	Reallotment pp. 49 - 63, 67-69, 75-78,
	6.SP	**Statistics and Probability**	
		Develop understanding of statistical variability.	
6	1	Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*	Dealing with Data pp. 1 - 6, p 46, 50
6	2	Understand that a set of data collected to answer a statistical question has a distribution which can be describe by its center, spread, and overall shape.	Dealing with Data pp. 25 - 33, pp. 48, 52 - 53

6	3	Recognize that a measure of center for a numerical data set summarizes all of its values with a single, number, while a measure of variation describes how its values vary with a single number.	Dealing with Data pp. 25 - 33, pp. 48, 52 - 53
		Summarize and describe distribution.	
6	4	Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	Dealing with Data pp. 12-22, 34-45 48, 51-52, 54-55
6	5	Summarize numerical data sets in relation to their context, such as by:	Dealing with Data pp. 12 - 22, 34 - 45 48, 51-52, 54-55
		a.) Reporting the number of observations.	Dealing with Data pp. 12 - 22, 34 - 45 48, 51-52, 54-55
		b.) Describing the nature of the attribute under investigation, including how it was measured and its units of measurement	Dealing with Data pp. 12 - 22, 34 - 45 48, 51-52, 54-55
		c.) Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation) as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.	Dealing with Data pp. 12 - 22, 34 - 45 48, 51-52, 54-55
		d.) Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	Dealing with Data pp. 12 - 22, 34 - 45 48, 51-52, 54-55

*Addendum to cover all topics that are in the grade 6 standards but not included in these MiC units

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Grade	Number	STANDARDS FOR MATHEMATICAL PRACTICE	MiC Unit and Pages
7	**1**	**Make sense of problems and persevere in solving them.**	
		The philosophy of *Mathematics in Context* is influenced by Hans Fruedenthal's concept of "mathematics as a human activity." Informal real-world mathematical activities are the basis from which students can abstract and construct increasingly sophisticated mathematical concepts. Working through instruction leads to interconnections within and between content strands. When faced with a new problem students can often make meaning of the problems from multiple viewpoints, then apply a meaningful strategy to work toward a solution.	Building Formulas pp. 34-43; Packages and Polygons pp. 34-42
7	**2**	**Reason abstractly and quantitatively.**	
		The Algebra strand in *Mathematics in Context* emphasizes algebra as a language used to study relationships among quantities. Students learn to describe these relationships with a variety of representations and to make connections among these representations. The goal is for students to understand the use of algebra as a tool to solve problems that arise in the real world or in the world of mathematics, where symbolic representations can be temporarily freed of meaning to bring a deeper understanding of the problem. Student move from preformal to formal strategies to solve problems, learning to make reasonable choices about which algebraic representation to use.	Graphing Equations pp. 21-27,46; Building Formulas pp. 44- 51
7	**3**	**Construct viable arguments and critique the reasoning of others.**	
		The learning process can be effective only when it occurs within the context of interactive instruction. The questions are developed to have students explain and justify their solutions, to work to understand other students' solutions, to agree and disagree openly, to question alternatives, and to reflect on what was discussed and learned. Students are encouraged to communicate their knowledge, either verbally , in writing, or though some other means like pictures, diagrams, or models to other students and the teacher. Central to the MiC classroom is the development of students' abilities to use mathematical argumentation to support their own conjectures.	Building Formulas, pp. 22-33; Second Chance pp. 10-22
7	**4**	**Model with mathematics.**	
		The role of a model changes throughout instruction. Initially models are used to develop interpretations, representations, and strategies appropriate for engaging with a particular problem context. Students create drawings, diagrams, tables, and informal notations of concepts, procedures and strategies. Later in the learning process models are used for generalization, exploration, and reflection. Near the end of instruction, the "formal level" models involve reasoning , application, and summarizing with conventional symbols.	Second Chance pp. 1-3, 5-6, 15-17, 23, 36-44
7	**5**	**Use appropriate tools strategically.**	
		The starting point of any instructional sequence should involve situations that are experientially real to students so that they can immediately engage in meaningful mathematical activity. Investigations start with real-world context and progress to more abstract representations. All learners can engage in the various tools presented throughout the learning process. After experiencing a variety of representations and tools, students choose tools to problem solve.	Building Formulas, p 26-33, 34-43; Triangles and Beyond, pp. 8-15

7	**6**	**Attend to precision.**	
		Students work with ratio and apply their understanding to real world situations. Students use ratio to produce scale drawings, scale models, and conversions.	Ratio and Rate, p 30-49, 53-54, 59-63;
7	**7**	**Look for and make use of structure.**	
		Questioning that focus on patterns and structure help students to test conjectures and generalize.	Building Formulas pp. 2-12; Revisiting Numbers pp. 45-53
7	**8**	**Look for and express regularity in repeated reasoning.**	
		The design and structure of MiC helps students reflect and work toward important mathematical goals. MiC emphasizes a variety of modes of representations including visualization to help students generalize and make connections. In the example cited visualizing frogs jumping toward or away from a path helps students develop formal algebraic methods for solving linear equations. By simultaneously changing the diagrams and the equations the diagram visualizes to solve a problem, student learn to understand and use a formal way of solving equations.	Graphing Equations, pp. 26-37; Revisiting Number pp. 16-24
		STANDARDS FOR MATHEMATICAL CONTENT	
	7.RP	**Ratios and Proportional Relationships**	
		Analyze proportional relationships and use them to solve real-world and mathematical problems.	
7	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.*	Ratio and Rates pp. 4-10, 50, 56-57; Revisiting Number 1-9
7	2	Recognize and represent proportional relationships between quantities.	Ratio and Rates; Building Formulas
		a.) 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.	Building Formulas p 1-11, 22-33, 44-51, 54, 55-56, 60-62 ; Companion (7) pp. 77- 79; Revisiting Number 2-5
		b.) Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationship.	Building Formulas p 1-10, 14-33, 44-51, 54, 55-56, 60-62; Companion (7) pp. 77- 79 ; Graphing Equations pp.15-18
		c.) Represent proportional relationships by equations. For example, of 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.*	Building Formulas p 1-10, 14-33, 44-51, 54, 55-56, 60-62; Ratios and Rates p 2-10; More or Less pp. 1-8
		d.) Explain what a point (*x,y*) on the graph of a proportional relationship means in terms of the situation, with the special attention to the point (*0,0*) and (*1,r*) where *r is the unit rate.*	Dealing with Data pp. 7-10, Building Formulas pp. 22-25Companion (7) pp. 77- 79
7	3	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.*	More or Less, pp. 11-47; Ratio and Rate pp. 30-49, 53-54, 59-61
	7.NS	**The Number System**	
		Apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers.	
7	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.	Revisiting Numbers pp. 45-46; Companion workbook (7) pp. 35-36

		a.) 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.*	Revisiting Numbers pp. 44-45; Companion workbook (7) pp. 52-54
		b.) Understand *p + q* as the number located a distance I*q* I from *p,* in 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.	Revisiting Numbers 45-46; Companion Workbook (7) pp. 52-54
		c.) 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.	Revisiting Numbers pp. 45-46
		d.) Apply properties of operations as strategies to add and subtract rational numbers.	Revisiting Numbers pp. 37-44, 45-46; Companion Workbook pp. 32-53
7	2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.	Revisiting Numbers Section C - E, pp. 25-53
		a.) 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.	Revisiting Numbers pp. 40-44, 46-48
		b.) Understand that integers can be divided, provided that the division 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.	Revisiting Numbers pp. 46-50, 51-53,59,68; Companion Workbook (7) pp. 46
		c.) Apply properties of operations as strategies to multiply and divide rational numbers.	Revisiting Numbers pp. 35-44, 57-58, 63-66
		d.) 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.	Companion workbook (7) pp. 46-48, 49 - 51; Revisiting Numbers pp. 46-48
	7.EE	**Expressions and Equations**	
		Use properties of operations to generate equivalent expressions.	
7	1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	Building Formulas pp. 6-21, 62-63, 67-69; Graphing Equations pp. 29-37
7	2	Understand that rewriting an expression is 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"*	Building Formulas pp. 6-21, 62-63, 67-69; More or Less pp. 18-34
		Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	
7	3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. 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 make $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 chick of the exact computation.*	Building Formulas pp. 22-51, 54-56, 60-64; Revisiting Numbers pp.1 - 44; Ratios and Rates pp. 4-10, 50, 56-57

7	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.	Building Formulas pp. 22-51, 54-56, 60-64; Graphing Equations pp. 28-37, 47, 50-52
		a.) 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 evaluations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identify 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?*	Building Formulas pp. 22-51, 54-56, 60-64; Packages and Polygons pp. 36-52, 56-58, 63-66; Graphing Equations pp. 28-37, 47, 50-52
		b.) 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 sales person, 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.*	Building Formulas, p 31, Graphing Equations 6-11, 44-45, 48; Companion Workbook (8) pp. 48-50
	7.G	**Geometry**	
		Draw, construct, and describe geometrical figures and describe the relationships between them.	
7	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.	Ratios and Rates pp. 30-48, 53-54, 59-62,
7	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, notice when the conditions determine a unique triangle, more than one triangle or no triangle.	Triangles and Beyond, pp.8-23, 45-53, 54-56, 58-59
7	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.	Packages and Polygons pp. 3-13
		Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	
7	4	Know the formulas for the area and circumference of a circle and use them to solve problem; give an informal derivation of the relationship between the circumference and area of a circle.	Building Formulas pp. 34-39
7	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.	Triangles and Beyond, p 16-23,
7	6	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.	Building Formulas, pp. 34 - 43, 54, 62; Packages and Polygons, pp. 43 - 52, 57 - 58, 65-66
	7.SP	**Statistics and Probability**	
		Use random sampling to draw inferences about population.	
7	1	Understand that statistics can be used to gain information about a population by examining a sample of 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 sample and support valid inferences.	Ratios and Rates pp. 1-4, 11-17, 21-29, Dealing with Data pp. 1-6, 46, 50

7	2	Use data from a random sample to draw inferences about 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 school elections based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*	Dealing with Data pp. 1-6, 46, 50 Second Chance, pp. 10 -22, 46-47, 52-54
		Draw informal comparative inferences about two populations.	
7	3	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.*	Second Chance, pp. 10 -22, 46-47, 52-54
7	4	Use measures of center and measures of variability for numerical data from random samples to raw 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.*	Second Chance, pp. 10 - 22, 46-47, 52-54
		Investigate chance processes and develop, use, and evaluate probability models.	
7	5	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 not likely, and a probability near 1 indicates a likely event.	Second Chance pp. 10 - 22, 46-47, 52-54
7	6	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 give the probability. *For example, when rolling a number cube 500 times, precinct that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*	Second Chance, pp. 23-34, 36-44, 48-50, 54-56
7	7	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of discrepancy.	Second Chance Sections A-D
		a.) 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.*	Second Chance, pp. 1 - 9, 10- 21, 45, 51-52
		b.) 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 from the spinning penny appear to be equally likely based on the observed frequencies?*	Second Chance, pp. 10 - 14, 16, 26, 28, 30
7	8	Find the probabilities of compound events using organized lists, tables, tree diagrams, and simulation.	Second Chance - Section B & D
		a.) 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.	Second Chance, pp. 10 - 22, 35-44, 46-47 50, 52-54, 55-56

		b.) Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g. "rolling double sixes")., identify the outcome in the sample space which compose the event.	Second Chance, pp. 10 - 22, 35-44, 46-47 50, 52-54, 55-56
		c.) 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?*	Second Chance pp. 16 - 22, 35

COMMON CORE STATE STANDARDS FOR MATHEMATICS

Correlated to Mathematics in Context® (MiC)

The cited unit and pages are specific examples of coverage within an MiC unit. The curriculum design and realistic contexts of MiC support the Practice Standards in every lesson and every unit.

Grade	Number	STANDARDS FOR MATHEMATICAL PRACTICE	MiC Unit and Pages
8	**1**	**Make sense of problems and persevere in solving them.**	
		Students make sense of solving systems of equations problems by exploring informal methods first. Then when conceptual understanding is developed, formalized strategies and symbol manipulation is investigated. In Comparing Quantities substitution (exchange) is introduced using bartering. To solve problems about the combined costs use charts to find patterns and combinations. The real world context also informally introduces matrices. Students use a variety of representations to help them persevere and make sense of the solutions. Later, in Algebra Rules, students use formal strategies, variables, equations, and graphs to solve problems successfully.	Comparing Quantities pp. 1-5, 8-10, 16-49; Algebra Rules pp. 36-41, 58, 64-65
8	**2**	**Reason abstractly and quantitatively.**	
		In *It's All the Same* students apply their knowledge of similar triangles to solve realistic problems, like calculating the height of a bridge above the river. In the last section of this unit, students review the concept that parallel lines in a coordinate system have the same slope and that perpendicular lines have slopes that are each other's negative reciprocal. The slopes of lines are, likewise, used to prove where the intersecting lines are perpendicular. Students also use the Pythagorean theorem to calculate the lengths of line segments to prove whether or not a quadrilateral is a rhombus and whether the diagonals for a rectangle have the same length. The Pythagorean theorem is also used to calculate the distance between two separate points on a grid.	It's All the Same pp. 22-51, 54-56, 59-64
8	**3**	**Construct viable arguments and critique the reasoning of others.**	
		In *Ups and Downs* students graph, describe, and analyze real data about natural phenomena that corresponds to a variety of relationships; linear, quadratic, and exponential growth and decay. Students investigate linear and quadratic growth by looking at the tables, graphs, and formulas that represent different types of growth. Students learn to define, evaluate and compare the differences between linear and quadratic growth.	Ups and Downs, pp. 8-9, 13-34, 43-46, 49-51 , 54-58; Patterns and Figures pp. 1-19, 23-49; Algebra Rules pp. 1-12, 13-24, 48-52
8	**4**	**Model with mathematics.**	
		In *Patterns and Figures* students study number sequences and the recursive and direct formulas that describe them. The area model, dot patterns, and number strips are used to introduce square numbers and quadratic expressions. The use of these models enable to students to more formally understand the concept of equivalent formulas and expressions. Later, in *Algebra Rules,* students use tree diagrams and the number line to move to more formalized symbolic representations.	Patterns and Figures, pp. 3- 27, 39-41, 44-47; Algebra Rules pp. 1 - 12, 55, 60
8	**5**	**Use appropriate tools strategically.**	

		Mathematics in Context is written so that teachers can personalize their instruction to meet the needs of the learners. It is not scripted so that teachers can use formative instruction to make instructional decisions. (See Assessment Pyramid, TEACHER EDITION pp. XVI-XVII). The program includes the use of a variety of tools throughout the grade levels. Students can solve problems using paper/pencil, a variety of models, and tools used to measure and draw geometric figures. MiC online provides additional tools to support student learning.	Teacher's Guides, "Goals and Assessment", pp. XVI-XVII; "Reaching All Learners" below student pages
8	**6**	**Attend to precision.**	
		One of the goals in 8th grade is to have students learn to define, evaluate, represent linear functions to solve problems. Students analyze, describe, and communicate the connections between proportional relationships, lines, and linear equations.	Ups and Downs pp. 13- 22, 49-50, 54-55; It's All the Same pp. 46-51, 56, 63-64; Insights into Data pp. 44- 63, 68-69, 75-78; Algebra Rules pp. 13- 24, 56, 61-62
8	**7**	**Look for and make use of structure.**	
		The structure of the rectangular model is used to explain and use the distributive property in a variety of strands. In *Revisiting Numbers s* tudents learn to multiply mixed numbers using the distributive property. They calculate chances for independent events in *Great Predictions.* Last, in *Algebra Rules* it is revisited to find equivalent expressions and multiply binomials.	Revisiting Numbers pp. 40-44; Great Predictions, p 40-49; Algebra rules, p 48 - 54, 59, 66
8	**8**	**Look for and express regularity in repeated reasoning.**	
		Negative exponents are introduced in *Revisiting Numbers.* Students develop an understanding of this notation by describing, making predictions, and identifying patterns in an string of repeated division by ten used to demonstrate the dilution process. Once students can use multiple representations to represent these small amounts, the students again study repeated computations, patterns and structure to formalize two rules for operations with powers of 10.	Revisiting Numbers pp. 17-24, 55-56, 62-63
		STANDARDS FOR MATHEMATICAL CONTEXT	
	8.NS	**The Number System**	
		Know that there are numbers that are not rational, and approximate them by rational numbers.	
8	1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	Revisiting Number pp. 45-53, 59, 68; Companion Workbook (8) pp. 10-11
8	2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., Π^2). For example, by truncating the decimal expansion of $\sqrt{2}$ shows that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximation.	Revisiting Number pp. 50-51; Patterns and Figures pp. 20-23, 26-27, 47; Companion Workbook (8) pp. 14
	8. EE	**Expressions and Equations**	
		Work with radicals and integer exponents.	
8	1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example,* $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.	Revisiting Numbers pp. 17-24, 55-56, 62-63; Companion Workbook (8) pp. 5

8	2	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where *p* is a positive rational number. Evaluate square toots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.	Revisiting Numbers pp. 50-53, 59, 68; Patterns and Figures pp. 20-23, 26-27, 47; Companion Workbook (8) pp. 10-11, 14
8	3	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United states as* 3×10^8 *and the population of the world as* 7×10^9*, and determine that the world population is more than 20 times larger.*	Revisiting Numbers pp. 16-24; Companion Workbook (8) pp. 4
8	4	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notations are used. Use scientific notation and choose units of appropriate size for measurement of very large and small quantities (e.g., use millimeters per year for seafloor spreading.). Interpret scientific notation that has been generated by technology.	Revisiting Numbers pp. 8-24; Companion Workbook (8) pp. 5
		Understand the connections between proportional relationships, lines, and linear equations.	
8	5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*	Revisiting Numbers pp. 2-5; Ups and Downs pp. 18-22, 49-50, 54-55; Algebra Rules pp. 13-24
8	6	Use similar triangles to explain why the slope *m* is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at *b.*	It's All the Same pp. 12-13, 45-51, 53, 56
		Analyze and solve linear equations and pairs of simultaneous line equations.	
8	7	Solve linear equations in one variable.	
		a.) Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a= a$, or $a = r$ esults (Where *a* and *b* are different numbers).	Graphing Equations pp. 28-43; Algebra Rules pp. 37-41, 58, 64-64; Companion Workbook pp. 44-45, 109-110
		b.) Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	Patterns and Figures pp. 12-19, 40-41, 45-46; Algebra Rules pp. 3-12, 33-34, 42-48; Companion Workbook pp. 109-110
8	8	Analyze and solve pairs of simultaneous linear equations.	
		a.) Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.	Algebra Rules, pp. 36, 37 - 41, 58, 64-65; Companion Workbook p .46-47
		b.) Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*	Comparing Quantities, pp. 28-33, 38, 47 - 49; Algebra Rules pp. 36; Companion Workbook pp. 51-53, 105-106

		c.) Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, give coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*	Comparing Quantities, p 16 - 49; Ups and Downs pp. 18 - 19; Algebra Rules, pp. 36
	8.F	**Functions**	
		Define, evaluate, and compare functions.	
8	1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	Ups and Downs, pp. 13 - 34, 43-46
8	2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal description). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*	Graphing Equations, pp. 22 - 23; Ups and Downs, pp. 18 - 19
8	3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function* $A = s^2$ *given the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.*	Ups and Downs, pp. 8-9, 13-34, 43-46, 49-51 , 54-58; Patterns and Figures pp. 1-19, 23-49; Algebra Rules pp. 1-12, 13-24, 48-52
		Use functions to model relationships between quantities.	
8	4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x,y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	Ups and Downs, pp. 13 - 34, 43-46; Algebra Rules pp. 1-12, 13-24, 48-52
8	**5**	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	Ups and Downs, pp. 8-9, 13-34, 43-46,49-51 , 54-58; Patterns and Figures pp. 1-19, 23-49; Algebra Rules pp. 1-12, 13-24, 48-52
	8.G	**Geometry**	
	Understand congruence and similarity using physical models, transparencies, or geometry software.		
8	1	Verify experimentally the properties of rotations, reflections, and translations.	Also: Triangles and Beyond (7)
		a.) Lines are taken to lines, and line segments to lines segments of the same length.	It's All the Same pp.49-51, 63-64
		b.) Angles are taken to angles of the same measure.	It's All the Same pp. 2-7, 22-36, 52, 57
		c.) Parallel lines are taken to parallel lines.	It's All the Same pp. 2-7, 29-34, 35-36,45-51
8	2	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; give two congruent figures, describe a sequence that exhibits the congruence between them.	It's All the Same pp. 9 -44; Companion Workbook pp. 27-28, 33
8	3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	It's All the Same pp. 45-51, 56, 63-64; Companion Workbook pp. 35-36

8	4	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	It's All the Same pp. 2-10, 29-30, 35-36
8	5	Use informal arguments to establish facts about the angle sum and exterior angles of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example,* arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversal why this is so.	It's All The Same pp. 39-36
		Understand and apply the Pythagorean Theorem.	
8	6	Explain a proof of the Pythagorean Theorem and its converse.	Triangles and Beyond (7) pp.16-23, 24 - 34, 57, 63
8	7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	Looking At an Angle, pp. 47 - 50, 54-55,
8	8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	It's All the Same, pp. 45 - 51, 56, 63-64
		Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.	
8	9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	Building Formulas, pp. 34 - 42; Companion Workbook pp. 118-119
	8.SP	**Statistics and Probability**	
		Investigate Patterns of association in bi-variate data.	
8	1	Construct and interpret scatter plots for bi-variate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive and negative association, linear association, and nonlinear association.	Insights into Data, pp. 3 - 10, 64, 70-71
8	2	Know that straight lines are widely used to model relationships between two quantities variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	Insights into Data, pp. 44 - 52, 68, 75 - 76
8	3	Use the equation of a linear model to solve problems in the context of bi-variate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1/5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.*	Insights into Data, pp. 53 - 63, 69, 77 - 78
8	4	Understand that patterns of association can also be seen in bi-variate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*	Great Predictions, pp. 12 - 23, 51 - 52, 56 - 58