i-Ready Classroom Mathematics

to the

California Common Core State Standards for Mathematics

Grade 7

California Common Core State Standards for Mathematics Grade 7		i-Ready Classroom Mathematics Lessons Grade 7
Grade 7		
7.RP	**Ratios and Proportional Relationships**	
	Analyze proportional relationships and use them to solve real-world and mathematical problems.	
7.RP.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 ½/¼ miles per hour, equivalently 2 miles per hour.*	**Lesson 2:** Find Unit Rates Involving Ratios of Fractions **Supporting Content:** Lesson 4: Represent Proportional Relationships; Lesson 5: Solve Proportional Relationship Problems **Math in Action:** pp. 119–127
7.RP.2	Recognize and represent proportional relationships between quantities.	**Lesson 3:** Understand Proportional Relationships **Lesson 4:** Represent Proportional Relationships **Lesson 5**: Solve Proportional Relationship Problems **Supporting Content:** Lesson 1: Solve Problems Involving Scale; Lesson 6: Solve Area and Circumference Problems Involving Circles
7.RP.2.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.	**Lesson 4**: Represent Proportional Relationships **Supporting Content:** Lesson 5: Solve Proportional Relationship Problems **Math in Action:** pp. 119–127
7.RP.2.b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	**Lesson 3**: Understand Proportional Relationships **Lesson 4:** Represent Proportional Relationships **Lesson 5:** Solve Proportional Relationship Problems **Supporting Content:** Lesson 1: Solve Problems Involving Scale **Math in Action**: pp. 119–127

California Common Core State Standards for Mathematics Grade 7		i-Ready Classroom Mathematics Lessons Grade 7
7.RP.2.c	Represent proportional relationships by equations.	**Lesson 3:** Understand Proportional Relationships **Supporting Content:** Lesson 4: Represent Proportional Relationships; Lesson 5: Solve Proportional Relationship Problems **Math in Action**: pp. 119–127
7.RP.2.d	Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.	**Lesson 4:** Represent Proportional Relationships **Supporting Content:** **Math in Action**: pp. 119–127
7.RP.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.*	**Lesson 5:** Solve Proportional Relationship Problems **Lesson 20**: Solve Problems Involving Percents **Lesson 21:** Solve Problems Involving Percent Change and Percent Error **Supporting Content:** Lesson 23: Reason About Random Samples; Lesson 24: Compare Populations; Lesson 31: Solve Problems Involving Experimental Probability **Math in Action:** pp. 119–127, 525–533

California Common Core State Standards for Mathematics Grade 7		i-Ready Classroom Mathematics Lessons Grade 7
7.NS	**The Number System**	
	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	
7.NS.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.	**Lesson 7:** Understand Addition with Negative Integers **Lesson 8**: Add with Negative Numbers **Lesson 9**: Understand Subtraction with Negative Integers **Lesson 10**: Add and Subtract Positive and Negative Numbers **Supporting Content**: Lesson 14: Use the Four Operations with Negative Numbers **Math in Action:** pp. 203–211
7.NS.1.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.*	**Lesson 7:** Understand Addition with Negative Integers **Supporting Content**: Lesson 8: Add with Negative Numbers; Lesson 10: Add and Subtract Positive and Negative Numbers **Math in Action**: pp. 203–211
7.NS.1.b	Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.	**Lesson 7:** Understand Addition with Negative Integers **Supporting Content:** Lesson 8: Add with Negative Numbers; Lesson 10: Add and Subtract Positive and Negative Numbers **Math in Action**: pp. 203–211
7.NS.1.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.	**Lesson 9:** Understand Subtraction with Negative Integers **Supporting Content:** Lesson 10: Add and Subtract Positive and Negative Numbers **Math in Action**: pp. 203–211

California Common Core State Standards for Mathematics Grade 7		i-Ready Classroom Mathematics Lessons Grade 7
7.NS.1.d	Apply properties of operations as strategies to add and subtract rational numbers.	**Lesson 8**: Add with Negative Numbers **Lesson 10:** Add and Subtract Positive and Negative Numbers **Supporting Content:** Lesson 9: Understand Subtraction with Negative Integers; Lesson 15: Write Equivalent Expressions Involving Rational Numbers; Lesson 17: Understand Multi-Step Equations **Math in Action**: pp. 203–211
7.NS.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.	
7.NS.2.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.	**Lesson 11:** Understand Multiplication with Negative Integers **Supporting Content:** Lesson 12: Multiply and Divide with Negative Numbers **Math in Action**: pp. 291–299
7.NS.2.b	Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.	**Lesson 12**: Multiply and Divide with Negative Numbers **Supporting Content**: Lesson 11: Understand Multiplication with Negative Integers **Math in Action:** pp. 291–299
7.NS.2.c	Apply properties of operations as strategies to multiply and divide rational numbers.	**Lesson 12:** Multiply and Divide with Negative Numbers **Supporting Content:** Lesson 14: Use the Four Operations with Negative Numbers; Lesson 15: Write Equivalent Expressions Involving Rational Numbers; Lesson 17: Understand Multi-Step Equations **Math in Action:** pp. 291–299

California Common Core State Standards for Mathematics Grade 7		i-Ready Classroom Mathematics Lessons Grade 7
7.NS.2.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.	**Lesson 13:** Express Rational Numbers as Terminating or Repeating Decimals **Supporting Content:** Lesson 30: Understand Probability **Math in Action**: pp. 291–299
7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers.	**Lesson 14**: Use the Four Operations with Negative Numbers **Supporting Content:** Lesson 15: Write Equivalent Expressions Involving Rational Numbers; Lesson 20: Solve Problems Involving Percents; Lesson 21: Solve Problems Involving Percent Change and Percent Error; Lesson 24: Compare Populations; Lesson 25: Solve Problems Involving Area and Surface Area; Lesson 26: Solve Problems Involving Volume **Math in Action**: pp. 291–299
7.EE	**Expressions and Equations**	
	Use properties of operations to generate equivalent expressions.	
7.EE.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	**Lesson 15**: Write Equivalent Expressions Involving Rational Numbers **Supporting Content**: Lesson 16: Understand Reasons for Rewriting Expressions; Lesson 17: Understand Multi-Step Equations; Lesson 18: Write and Solve Multi-Step Equations; Lesson 19: Write and Solve Inequalities **Math in Action**: pp. 403–411

California Common Core State Standards for Mathematics Grade 7		i-Ready Classroom Mathematics Lessons Grade 7
7.EE.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."*	**Lesson 16:** Understand Reasons for Rewriting Expressions **Supporting Content**: Lesson 6: Solve Area and Circumference Problems Involving Circles; Lesson 15: Write Equivalent Expressions Involving Rational Numbers; Lesson 20: Solve Problems Involving Percents; Lesson 25: Solve Problems Involving Area and Surface Area; Lesson 26: Solve Problems Involving Volume **Math in Action**: pp. 403–411
	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	
7.EE.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 making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*	**Lesson 13**: Express Rational Numbers as Terminating or Repeating Decimals **Lesson 14**: Use the Four Operations with Negative Numbers **Supporting Content:** Lesson 7: Understand Addition with Negative Integers; Lesson 8: Add with Negative Numbers; Lesson 9: Understand Subtraction with Negative Integers; Lesson 10: Add and Subtract Positive and Negative Numbers; Lesson 11: Understand Multiplication with Negative Integers; Lesson 12: Multiply and Divide with Negative Numbers; Lesson 18: Write and Solve Multi-Step Equations; Lesson 19: Write and Solve Inequalities; Lesson 20: Solve Problems Involving Percents; Lesson 21: Solve Problems Involving Percent Change and Percent Error; Lesson 24: Compare Populations; Lesson 25: Solve Problems Involving Area and Surface Area; Lesson 26: Solve Problems Involving Volume; Lesson 28: Find Unknown Angle Measures **Math in Action**: pp. 291–299

California Common Core State Standards for Mathematics Grade 7		i-Ready Classroom Mathematics Lessons Grade 7
7.EE.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.	**Lesson 17:** Understand Multi-Step Equations **Lesson 18**: Write and Solve Multi-Step Equations **Lesson 19:** Write and Solve Inequalities **Supporting Content:** Lesson 1: Solve Problems Involving Scale; Lesson 5: Solve Proportional Relationship Problems; Lesson 16: Understand Reasons for Rewriting Expressions; Lesson 25: Solve Problems Involving Area and Surface Area; Lesson 26: Solve Problems Involving Volume; Lesson 28: Find Unknown Angle Measures **Math in Action**: pp. 403–411
7.EE.4.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 equations of these forms fluently. 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?*	**Lesson 18**: Write and Solve Multi-Step Equations **Supporting Content:** **Math in Action**: pp. 403–411
7.EE.4.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 salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.*	**Lesson 19:** Write and Solve Inequalities **Supporting Content:** Lesson 29: Draw Plane Figures with Given Conditions **Math in Action**: pp. 403–411

California Common Core State Standards for Mathematics Grade 7		i-Ready Classroom Mathematics Lessons Grade 7
7.G	**Geometry**	
	Draw, construct, and describe geometrical figures and describe the relationships between them.	
7.G.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.	**Lesson 1**: Solve Problems Involving Scale **Supporting Content**: Lesson 2: Find Unit Rates Involving Ratios of Fractions; Lesson 29: Draw Plane Figures with Given Conditions **Math in Action**: pp. 119–127
7.G.2	Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	**Lesson 29:** Draw Plane Figures with Given Conditions **Supporting Content:** **Math in Action**: pp. 657–665
7.G.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.	**Lesson 27**: Describe Plane Sections of Three-Dimensional Figures
	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	
7.G.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	**Lesson 6:** Solve Area and Circumference Problems Involving Circles **Supporting Content:** Lesson 25: Solve Problems Involving Area and Surface Area; Lesson 26: Solve Problems Involving Volume **Math in Action**: pp. 119–127
7.G.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.	**Lesson 28:** Find Unknown Angle Measures **Supporting Content:** **Math in Action**: pp. 657–665

California Common Core State Standards for Mathematics Grade 7		i-Ready Classroom Mathematics Lessons Grade 7
7.G.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.	**Lesson 25**: Solve Problems Involving Area and Surface Area **Lesson 26**: Solve Problems Involving Volume **Supporting Content:** Lesson 15: Write Equivalent Expressions Involving Rational Numbers; Lesson 16: Understand Reasons for Rewriting Expressions **Math in Action**: pp. 657–665
7.SP	**Statistics and Probability**	
	Use random sampling to draw inferences about a population.	
7.SP.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	**Lesson 22**: Understand Random Sampling **Supporting Content:** Lesson 23: Reason About Random Samples; Lesson 24: Compare Populations **Math in Action**: pp. 525–533
7.SP.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.	**Lesson 23**: Reason About Random Samples **Supporting Content**: Lesson 22: Understand Random Sampling **Math in Action**: pp. 525–533

California Common Core State Standards for Mathematics Grade 7		i-Ready Classroom Mathematics Lessons Grade 7
	Draw informal comparative inferences about two populations.	
7.SP.3	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.*	**Lesson 24**: Compare Populations **Supporting Content**: **Math in Action**: pp. 525–533
7.SP.4	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*	**Lesson 24**: Compare Populations **Supporting Content:** **Math in Action**: pp. 525–533
	Investigate chance processes and develop, use, and evaluate probability models.	
7.SP.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 nor likely, and a probability near 1 indicates a likely event.	**Lesson 30**: Understand Probability **Supporting Content:** Lesson 31: Solve Problems Involving Experimental Probability; Lesson 32: Solve Problems Involving Probability Models; Lesson 33: Solve Problems Involving Compound Events **Math in Action**: pp. 757–765

California Common Core State Standards for Mathematics Grade 7		i-Ready Classroom Mathematics Lessons Grade 7
7.SP.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 given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*	**Lesson 31:** Solve Problems Involving Experimental Probability **Supporting Content:** **Math in Action**: pp. 757–765
7.SP.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 the discrepancy.	**Lesson 31:** Solve Problems Involving Experimental Probability **Lesson 32:** Solve Problems Involving Probability Models **Supporting Content:** Lesson 33: Solve Problems Involving Compound Events **Math in Action**: pp. 757–765
7.SP.7.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 .*	**Lesson 32:** Solve Problems Involving Probability Models **Supporting Content:** Lesson 33: Solve Problems Involving Compound Events **Math in Action**: pp. 757–765
7.SP.7.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 for the spinning penny appear to be equally likely based on the observed frequencies?*	**Lesson 31:** Solve Problems Involving Experimental Probability **Lesson 32**: Solve Problems Involving Probability Models

California Common Core State Standards for Mathematics Grade 7		i-Ready Classroom Mathematics Lessons Grade 7
7.SP.8	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.	**Lesson 33**: Solve Problems Involving Compound Events **Supporting Content**: **Math in Action**: pp. 757–765
7.SP.8.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.	**Lesson 33**: Solve Problems Involving Compound Events
7.SP.8.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 outcomes in the sample space which compose the event.	**Lesson 33**: Solve Problems Involving Compound Events **Supporting Content**: **Math in Action**: pp. 757–765
7.SP.8.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?*	**Lesson 33**: Solve Problems Involving Compound Events **Supporting Content**: **Math in Action**: pp. 757–765