

PLC Question #1: What do we want all students to know and be able to do?

Unit 1: Ratios and Proportional Reasoning	Unit 2: Percents	Unit 3: Integers
Priority Standard(s) - M.7.RP.A.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. - M.7.RP.A.3 Use proportional relationships to solve multi-step ratio and percent problems.	Priority Standard(s) M.7.RP.A.3 Use proportional relationships to solve multi-step ratio and percent problems.	Priority Standard(s) M.7.NS.A.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line.
Supporting Standard(s) - M.7.RP.A.2 Recognize and represent proportional relationships between quantities. 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. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. 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 $t = pn$. 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. - M.7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers	Supporting Standard(s) - M.7.RP.A.2 Recognize and represent proportional relationships between quantities. c. Represent proportional relationships by equations. - M.7.EE.A.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. - M.7.EE.B.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.	Supporting Standard(s) - M.7.NS.A.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line. a. Describe situations in which opposite quantities combine to make 0. For example, if you earn \$10 and then spend \$10, you are left with \$0. 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. 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. d. Apply properties of operations as strategies to add and subtract rational numbers. - M.7.NS.A.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. 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. 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. c. Apply properties of operations as strategies to multiply and divide rational numbers. - M.7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers. - M.7.EE.B.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.	
Learning Outcomes		Learning Outcomes		Learning Outcomes	
Students need to know (concrete knowledge)	DOK Level	Students need to know (concrete knowledge)	DOK Level	Students need to know (concrete knowledge)	DOK Level
Ex. vocabulary, facts, concepts, etc.		Ex. vocabulary, facts, concepts, etc.		Ex. vocabulary, facts, concepts, etc.	
- M.6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. - M.6.NS.A.1 Interpret, represent, and compute division of fractions by fractions and solve word problems by using visual fraction models (e.g., tape diagrams, area models, or number lines), equations, and the relationship between multiplication and division.		- M.6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. - M.6.RP.A.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. - M.6.RP.A.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 lines, or equations.		- M.3.OA.D.8 [WI.2010. 3.OA.B.9] Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations. - M.3.OA.B.4 [WI.2010. 3.OA.B.5] Apply properties of operations as strategies to multiply and divide. Student use of the formal terms for these properties is not necessary. - M.2.NBT.B.5 Flexibly and efficiently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. In Grade 2, subtraction with decomposition is an exception and may include drawings or representations.	
Students will understand (abstract ideas)	DOK Level	Students will understand (abstract ideas)	DOK Level	Students will understand (abstract ideas)	DOK Level
Ex. connections, relationships, frameworks, etc.		Ex. connections, relationships, frameworks, etc.		Ex. connections, relationships, frameworks, etc.	
Students will distinguish between situations that are proportional or not proportional.		Students will learn to solve percent problems involving percent of change, sales tax, tips, discount, markup, and simple interest.		Students will learn to use and justify the rules for adding, subtracting, multiplying, and dividing integers.	
Students will do (active application)	DOK Level	Students will do (active application)	DOK Level	Students will do (active application)	DOK Level
- I can find unit rates in real world problems. - I can simplify complex fractions and use those fractions to determine unit rates. - I can use dimensional analysis to convert units of measure. - I can simplify and compare ratios and rates to identify proportional and nonproportional relationships. - I can use proportions and unit rates to solve real world problems. - I can graph ratios and rates to identify, compare, and contrast proportional and nonproportional relationships. - I can use ratios and solve rates to write and solve		- I can use models to solve real world problems involving percents. - I can solve problems involving percent of a number. - I can estimate the percent of a number using fractions and decimals. - I can use bar diagrams to model percents and make comparisons about different quantities. - I can use the percent proportion to solve problems involving percents. - I can use the percent equation to solve problems involving percents. - I can use bar diagrams to solve real world problems involving percent of change.		- I can evaluate expressions involving absolute values. - I can use models to add integers. - I can add integers with the same sign and with different signs. - I can use models to subtract integers. - I can subtract integers with the same sign and with different signs. - I can find the distance between two integers on a number line. - I can add and subtract integers to solve real world problems. - I can multiply integers with the same sign and with different signs.	

proportions. - I can use tables and graphs to relate unit rates to constant rate of change. - I can use tables and graphs to find the slope of a line. - I can use tables, graphs, and equations to determine if a situation represents direct variation. - I can solve problems involving scale drawings.		- I can solve problems involving percent of change and percent error. - I can solve problems involving sales tax, tips, and markup. - I can solve problems involving percent discounts. - I can solve problems involving simple interest.		I can divide integers with the same sign and different signs.	
Domain-specific Vocabulary	Domain-specific Vocabulary	Domain-specific Vocabulary			
- Complex Fraction - Constant of Proportionality - Constant Rate of Change - Constant of Variation - Coordinate Plane - Cross Products - Dimensional Analysis - Direct Variation - Equivalent Ratios - Nonproportional - Proportional - Proportion - Ordered Pair - Origin - Quadrants - Rate - Rate of Change - Slope - Unit Rate - Unit Ratio - X axis - Y axis - X coordinate - Y coordinate	- Discount - Gratuity - Markdown - Markup - Percent Equation - Percent Error - Percent of Change - Percent of Decrease - Percent of Increase - Percent Proportion - Principal - Sales Tax - Selling Price - Simple Interest - Tip	- Absolute Value - Additive Inverse - Graph - Integer - Negative Integer - Opposites - Positive Integer - Zero Pair			

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Unit 4: Rational Numbers	Unit 5: Expressions
Priority Standard(s) M.7.NS.A.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line.	Priority Standard(s) M.7.EE.A.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
Supporting Standard(s) - M.7.NS.A.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line. a. Describe situations in which opposite quantities combine to make 0. For example, if you earn \$10 and then spend \$10, you are left with \$0. 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. 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. d. Apply properties of operations as strategies to add and subtract rational numbers. - M.7.NS.A.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. 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. 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. c. Apply properties of operations as strategies to multiply and divide rational numbers. 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. - M.7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers. - M.7.RP.A.3 Use proportional relationships to solve multi-step	Supporting Standard(s) - M.7.EE.A.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05." - M.7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers. (Note: Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)

ratio and percent problems M.7.EE.B.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.			
Learning Outcomes		Learning Outcomes	
Students need to know (concrete knowledge)	DOK Level	Students need to know (concrete knowledge)	DOK Level
Ex. vocabulary, facts, concepts, etc.		Ex. vocabulary, facts, concepts, etc.	
- M.6.NS.C.5 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 charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. - M.6.NS.B.3 Flexibly and efficiently add, subtract, multiply, and divide multi-digit decimals using strategies or algorithms based on place value, visual models, the relationship between operations, and the properties of operations.		- M.6.NS.C.6 Understand a rational number as a point on the number line. Extend number lines and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. - M.6.NS.C.6 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. - M.6.NS.C.6 c. Find and position integers and other rational numbers on a horizontal or vertical number line; find and position pairs of integers and other rational numbers on a coordinate plane.	
Students will understand (abstract ideas)	DOK Level	Students will understand (abstract ideas)	DOK Level
Ex. connections, relationships, frameworks, etc.		Ex. connections, relationships, frameworks, etc.	
Students will learn to add, subtract, multiply, and divide rational numbers.		Students will learn to use expressions to represent real world situations and apply the properties of operations to simplify and evaluate algebraic expressions.	
Students will do (active application)	DOK Level	Students will do (active application)	DOK Level
- I can use models to describe relationships between rational numbers. - I can write rational numbers as decimals and fractions. - I can compare and order rational numbers by writing them in the same form. - I can use a number line to add and subtract rational numbers.		- I can evaluate simple algebraic expressions. - I can identify and use mathematical properties to simplify algebraic expressions. - I can apply the Distributive Property to rewrite algebraic expressions. - I can simplify algebraic expressions by combining like terms. - I can add and subtract linear expressions.	

- I can add and subtract fractions with like denominators and with unlike denominators. - I can add and subtract mixed numbers. - I can multiply and divide fractions and mixed numbers. - I can convert between measurement systems. - I can use decimals and fractions to solve real world problems.		I can factor linear expressions.	
Domain-specific Vocabulary	Domain-specific Vocabulary		
- Bar Notation - Common Denominator - Least Common Denominator - Like Fractions - Rational Numbers - Repeating Decimals - Terminating Decimals - Unlike Fractions	- Expression - Simplest Form - Variable - Term - Like Terms - Coefficient - Constant - Prime Number - Greatest Common Factor - Commutative Property - Associative Property - Additive Identity Property - Multiplicative Identity Property - Multiplicative Property of Zero - Distributive Property		

