SD Common Core State Standards Disaggregated Math Template

Domain:	Number System	**Cluster:**	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers	**Grade level:**	7

Correlating Standard in Previous Year	Number Sequence & Standard	Correlating Standard in Following Year
6.NS.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, debits/credits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. 6.NS.6 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. 6.NS.6a 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. 6.NS.6b Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. 6.NS.6c 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 CC.6.NS.7 Understand ordering and absolute value of rational numbers. 6.NS.7a 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.* 6NS.7b Write, interpret, and explain statements of order for rational numbers in real-world contexts. (*for example, write -3 degrees Celsius > -7 degrees Celsius to express the fact that -3 is warmer than -7 degrees)* 6NS.7c Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for 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.* 6NS.7d Distinguish comparisons 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.*	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. 7.NS.1a Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.* 7.NS.1b Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. 7.NS.1c 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. 7.NS.1d Apply properties of operations as strategies to add and subtract rational numbers.	Terminates

Student Friendly Language:
I can show that the sum of a number and its opposite is zero. I can add rational numbers using absolute value. I can change a subtraction problem into an addition problem by adding the opposite (additive inverse). I can use a number line to find the difference between two integers. I can apply properties of operations to add and subtract rational numbers. I can determine if a solution is reasonable. I can give examples of real life situations involving the addition and subtraction of integers.

Know (Factual)	Understand (Conceptual) The students will understand that:	Do (Procedural, Application, Extended Thinking)
● Additive inverse of rational numbers ● Absolute value difference ● Properties of operations ● Addition and subtraction of rational numbers	A number and its opposite have a sum of 0. Subtraction of rational numbers is equivalent to adding the additive inverse. A vertical or a horizontal number line can be used to show the relationship of adding and subtracting rational numbers. When adding integers on a number line, the sum is located a distance in the positive or negative direction depending on the sign of the number. Properties of operations can be used strategies to add and subtract rational numbers.	Model addition and subtraction of rational numbers using a number line. Use properties of operations to add and subtract rational numbers in real world situations. Rewrite subtraction problems as addition problems by applying the additive inverse property. Describe real life situations in which opposite quantities combine to make 0. Explain sums of rational numbers by describing real-world contexts.

Key Vocabulary:
integers rational number opposites additive inverse absolute value number line commutative associative identity difference sum distance expression
Relevance and Applications: How might the grade level expectation be applied at home, on the job or in a real-world, relevant context? Include at least one example stem for the conversation with students to answer the question "why do I have to learn this"?
Sports: football yards gained and lost; golf strokes above and below par Temperature/elevation (Including fractional values) Money account balance, debit/credit Stock market Price increases/decreases Checking Account: Your current checking account balance is $200. You bought an iPod for $299 and basketball shoes for $109. You deposited $400, which you received from your birthday and Christmas, into the account. What is your account balance? Temperature: You and a group of friends are scaling Mount Rushmore. When you begin your expedition the temperature was 12 degrees Fahrenheit. When you reached the top of Lincoln's head the temperature was -6 degrees Fahrenheit, how much did the temperature drop while you were on your expedition?

SD Common Core State Standards Disaggregated Math Template

Domain:	Number System	**Cluster:**	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.	**Grade level:**	**7**

Correlating Standard in Previous Year	**Number Sequence & Standard**	**Correlating Standard in Following Year**
6.NS.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 birdhouse 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."* 6.NS.2 Fluently divide multi-digit numbers using the standard algorithm. 6.NS.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, debits/credits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each stuation.	7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. 7.NS.2a Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. 7.NS.2b Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then –(p/q) = (–p)/q =p/(–q). Interpret quotients of rational numbers by describing real-world contexts. 7.NS.2c Apply properties of operations as strategies to multiply and divide rational numbers. 7.NS.2d Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	8.NS.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, 3^2 × 3^(–5) = 3^ (–3) = 1/(3^ 3) = 1/27 8.NS.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., π2). *For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.* π2). *For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.* √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.

Student Friendly Language:
I can solve real-life multiplication and division problems involving negative and positive rational numbers. I can divide rational numbers and understand that the denominator cannot be zero and the answer will be rational. I can apply mathematical properties of operations (ex.Distributive Property) to multiply and divide rational numbers. I can use long division to find the decimal form of a rational number.

Know (Factual)	Understand (Conceptual) The students will understand that:	Do (Procedural, Application, Extended Thinking)
● Integer rules ● Zero cannot be used as a denominator ● Long division ● Properties of operations	Rules used to multiply and divide whole numbers and integers can be applied to multiply and divide rational numbers. Zero as a denominator is undefined. Long division is used to rewrite numbers into decimal form. A decimal of a rational number terminates in a zero or eventually repeats. Properties of operations can be used as strategies to multiply and divide rational numbers.	Apply integer rules to solve real-world problems involving rational numbers. Convert rational numbers to decimals using long division. Explain why zero cannot be a denominator. Explain the relationship between multiplication and division of integers and rational numbers in real-world examples. Apply properties of operations to rational numbers.

Key Vocabulary:
rational numbers integers (positive and negative numbers) quotient product properties of operations terminating decimals repeating decimals operations decimal divisordividend factor long division reciprocal
Relevance and Applications: How might the grade level expectation be applied at home, on the job or in a real-world, relevant context? Include at least one example stem for the conversation with students to answer the question “why do I have to learn this?”
You and five friends want a pop and decide to buy a 6 pack of Mello Yello. You are cheap and don’t want to pay for all the pop. So how much does each of you need to pay if the pop costs $2.99? Recipe: You are entertaining and planning on having six people over for brownies. You receive a text that says 6 more are planning on coming. Now you need to double your brownie recipe. How much of each of the following ingredients do you need now? Ingredients: ¾ c flour, ⅓ c.sugar, ½ c. brown sugar, 2 eggs, ¼ c.oil , 1 ½ c cocoa. Before you went to bed, you looked at the temperature and noticed that at 10pm it was 20 degrees. When you woke up at 6am, the temperature was -7 degrees. What was the temperature change per hour? Elevation: You begin to descend a mountain at a rate of 3/4 feet per 4 seconds. What will be your total change in elevation after climbing at this rate for 4 hours?

SD Common Core State Standards Disaggregated Math Template

Domain:	Number System	**Cluster:**	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers	**Grade level:**	7

Correlating Standard in Previous Year	Number Sequence & Standard	Correlating Standard in Following Year
6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. 6.NS.1 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 use a 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/bc.) 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?*	7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)	8.NS.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., π2). *For example, by truncating the decimal expansion of √2, show that √2 is between 1 and* *2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.* π2). *For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.* *√2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*

Student Friendly Language:
I can add, subtract, multiply, and divide rational numbers in real world problems.

Know (Factual)	Understand (Conceptual) The students will understand that:	Do (Procedural, Application, Extended Thinking)
• Real-world applications of rational number	Rules for all operations apply to real world situations.	Apply the four operations to real life problems involving rational numbers..

Key Vocabulary:
integer fractions rational numbers decimals reciprocal opposite absolute value operations ratios proportions common denominators
Relevance and Applications: How might the grade level expectation be applied at home, on the job or in a real-world, relevant context? Include at least one example stem for the conversation with students to answer the question "why do I have to learn this"?
Money: Using integers to balance a checkbook, figure interest, taxes, and to find the best buys. (Including fractional values.) Sports: To show gain and loss of yards, shooting averages, and other statistics. Temperature: Find changes in temperature using integers. Cooking: Representing equivalent fractions, deviating from the recipe (double batch or half-a-batch).