SD Common Core State Standards Disaggregated Math Template

Domain:	Expressions and Equations	**Cluster:**	Use properties of operations to generate equivalent expressions	**Grade level:**	7

Correlating Standard in Previous Year	Number Sequence & Standard	Correlating Standard in Following Year
6.EE.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.	7.EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients	8.EE.7 Solve linear equations in one variable. .EE.7b- Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms

Student Friendly Language:

I can use the associative, commutative, and distributive properties to solve problems involving linear expressions.
I can expand linear expressions with rational coefficients.
I can factor linear expressions with rational coefficients.
I can add linear expressions with rational coefficients.
I can subtract linear expressions with rational coefficients.

Know (Factual)	Understand (Conceptual) The students will understand that:	Do (Procedural, Application, Extended Thinking)
• Properties of operations (associative, commutative, distributive) • Rational coefficient • Linear expression • Simplify expression • Common factor	Properties of operations can be used to expand expressions with rational coefficients. Properties of operations can be used to factor expressions with rational coefficients. Properties of operations can be used to add expressions with rational coefficients. Properties of operations can be used to subtract expressions with rational coefficients.	Apply the properties of operations to solve problems involving linear expressions with rational coefficients. Expand linear expressions with rational coefficients. Factor linear expressions with rational coefficients. Add linear expressions with rational coefficients. Subtract linear expressions with rational coefficients.

Key Vocabulary:

Rational coefficient, Variable, Properties of operations (associative, commutative, distributive)
Factoring expressions, Expanding expressions, Linear expressions
Simplifying expressions, Like terms, Equivalent expressions

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"?

- Write an equivalent expression for 7(b + 3) – 5.
- Cheyanne says the two expressions 2(3a – 7) + 5a and 11a – 7 are equivalent? Is she correct? How do you know?
- Robert earned some money mowing lawns. Robert's sister has $10 more than twice as much money as him. Write and simplify an expression for the amount of money Robert's sister has.

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6.EE.4 Identify when two expressions are equivalent (i.e., when the 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.	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."	8.EE.4 Perform operations with numbers expressed in scientific notation,including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology

Student Friendly Language:

I can rewrite expressions in different forms (a+.05a = 1.05a).
I can explain how quantities are related (a = 1a).
I can explain how rewriting expressions can show how quantities are related.
I can understand that rewriting expressions in different forms can help show how quantities are related.

Know (Factual)	Understand (Conceptual) The students will understand that:	Do (Procedural, Application, Extended Thinking)
• Properties of operations • Relationships between expressions • A variety of expressions can represent contexts	Considering the context of a situation helps us better understand the problem. Rewriting an expression in different forms can shed light on how the quantities in a context are related.	Apply the properties of operations to rewrite equivalent expressions. Determine forms of expressions to represent specific contexts. Explain how multiple expressions are related given a context.

Key Vocabulary:

properties of operations (associative, commutative, distributive) equivalent order of operations
like terms combining like terms percent fraction decimal expressions simplify

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"?

Explain how a 40% discount is the same as finding 60% of the cost, *c*.

Alex and Becca both get paid an equal hourly wage of $7 per hour. This week, Becca made an additional $12 dollars in overtime. Write an expression that represents the weekly wages of both if A = the number of hours that Alex worked this week and B = the number of hours Becca worked this week? What is another way to write the expression?

Solution:
Students may create several different expressions depending upon how they group the quantities in the problem.
Possible student responses are:

Response 1: To find the total wage, first multiply the number of hours Alex worked by 7. Then, multiply the number of hours Becca worked by 7. Add these two values with the $12 overtime to find the total wages for the week. The student would write the expression 7A + 7B + 12.

Response 2: To find the total wages, add the number of hours Alex and Becca worked. Then, multiply the total number of hours worked by 7. Add the overtime to that value to get the total wages for the week. The student would write the expression 7(A + B) + 12.

Response 3: To find the total wages, find out how much Alex made and add that to how much Becca made for the week. To figure out Alex wages, multiply the number of hours he worked by 7. To figure out Becca's wages, multiply the number of hours she worked by 7 and then add the $12 she earned in overtime. Add Alex and Becca's wages for the week to find their combined total wages. The student would write the expression (7A) + (7B + 12).

SD Common Core State Standards Disaggregated Math Template

Domain:	Expressions and Equations	**Cluster:**	Solve real-life and mathematical problems using numerical and algebraic expressions and equations	**Grade level:**	7

Correlating Standard in Previous Year	Number Sequence & Standard	Correlating Standard in Following Year
6.EE.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 non negative rational numbers	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 as strategies 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.	8.EE.7 Solve linear equations in one variable. 8.EE.7a- 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 = b results (where a and b are different numbers). 8.EE.7b- Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Student Friendly Language:

I can solve real life problems with more than one step dealing with positive and negative numbers.
I can change between fractions, decimals, and percents mentally or with a calculator.
I can use calculators, models, and mental math to calculate and solve problems.
I can use estimation strategies to check my answer.

Know (Factual)	Understand (Conceptual) The students will understand that:	Do (Procedural, Application, Extended Thinking)
• Properties of operations • Relationships between fractions, decimals, and percents • Rational numbers include whole numbers, integers, fractions, decimals, and percents	Numbers can be converted into various forms such as whole numbers, fractions, decimals, integers, and percents to solve real life problems. Properties of operations can be used to make solving problems more efficient.	Compute multi-step real-life problems using the appropriate operations and strategies, such as mental math, modeling, and calculator. Compute multi-step real-life problems using positive and negative numbers. Convert between fractions, decimals, and percents.

Key Vocabulary:

whole number fraction decimal estimate round rational properties
convert percent ratio integer multi-step operations computation positive negative

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"?

Wage: Determining income after a raise in hourly rates.

Measurement: Centering multiple posters on a bedroom wall.

Savings: Figuring interest on your balance.

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6.EE.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 an equation or inequality true. 6.EE.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. 6.EE.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. 6.EE.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.	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. ● 7.EE.4a - 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?* ● 7.EE.4b - 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.*	8.EE.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.*

Student Friendly Language:
When given real world math problems with unknown values, I can write, solve and graph simple equations and inequalities to represent the situation. I can use the correct order of operations. I can use estimation to check if my answer makes sense.

Know (Factual)	Understand (Conceptual) The students will understand that:	Do (Procedural, Application, Extended Thinking)
● Equation ● Inequality ● Solution set ● Inverse Operations ● Constant Term ● Coefficient ● Like Terms ● Distributive Property ● Algebraic and Arithmetic Solutions ● Graphing Inequalities	There is a specific sequence of solving equations or inequalities. Variables can be used to represent quantities in real world problems. There are appropriate inverse operations necessary to evaluate an equation or inequality. Word problems can be solved by properly integrating variables into equations and inequalities. Equations yield one solution and inequalities produce a solution set that can be graphed. Algebraic solutions contain an unknown, while arithmetic solutions give a specific number.	Construct and evaluate simple equations and inequalities to solve word problems. Compare algebraic and arithmetic solutions. Summarize the sequence of operations in equations and inequalities. Apply knowledge of one step equations to 2-step equations. Construct and interpret the graph of a solution set for an inequality.

Key Vocabulary:					
variable	equation	inequalities	solution set	rational number	sequence
fraction	negative numbers	interpret	inverse operations	PEMDAS – Order of Operations	constant term
coefficient	like terms	solution set	distributive	property	

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 are constructing a kennel for your dog and you want to have an area of 64 feet squared. If you want to have a square kennel, what is the length of 1 side and what is the perimeter?

If you want to tile your kitchen floor and the area is 144 feet, what would be the length of 1 side and how many 12 inch tiles would you need to create the border?

You are raising money for an awesome band trip. The band boosters are donating $75 to each student. If you need $200 to attend, how many buckets of cookie dough at $5 per bucket would you need to sell?

If you made $50 a week babysitting and an extra $20 per lawn you mow, how many lawns would you need to mow in a week to make a total of $150?

Figure out how much money you need to make each month to reach a yearly goal.

Determine the cost per person for ordering pizza, tickets, etc…

How many t-shirts you have to sell to cover break even costs?

How many lawns do you have to mow to buy a new computer?