**6th Grade Advanced Expressions and Equations Unit Plan - 27 Days**

***Priority Standards***:

***Solve real-life and mathematical problems using numerical and algebraic expressions and equations.***

**MA.**[**7.EE.B.3**](http://www.corestandards.org/Math/Content/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.

**MA**[**.7.EE.B.4**](http://www.corestandards.org/Math/Content/7/EE/B/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.

***Supporting Standards:***

***Use properties of operations to generate equivalent expressions.***

**MA.7.EE.A.1** - Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients

**MA.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."*

**MA.7.EE.B.4.B -** 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?*

**MA.7.EE.B.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*.

Essential Question:

How can algebraic expressions and equations be used to model, analyze, and solve mathematical situations?

What properties are required in order to rewrite and evaluate algebraic expressions and solve equations?

How can information from a word problem be translated to create an equation?

Performance Task:

[Credit Card Activity](https://grade7commoncoremath.wikispaces.hcpss.org/Unit+3+Expressions+and+Equations/)

From Howard County Public Schools

*Task #1: Cost of Credit - Is it worth it? Activity Situation #1 (1a -b) ($150)*

*Task #2: Cost of Credit - Is it worth it? Activity Situation #1 (1c-d) ($250)*

*Task #3: Cost of Credit - Is it worth it? Activity Situation #1 (2a)*

*Task #4: Cost of Credit - Is it worth it? Activity Situation #2 (1 a-d)*

**Learning Targets/“I can statements…”:**

* I can persevere in solving problems (MP1)
* I can use appropriate tools strategically (MP5)
* I can look for and make sense of repeated reasoning (MP7)
* I can apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
  + I can use the commutative and associative properties to add linear expressions with rational coefficients.
  + I can use the distributive property to add and/or subtract linear expressions with rational coefficients.
  + I can use the distributive property to factor a linear expression with rational coefficients.
  + I can use the distributive property to expand a linear expression with rational coefficients.
* I can use equivalent expressions to understand the relationships between quantities.
* I can solve real-world problems using rational numbers in any form, including those problems involving multiple steps.
* I can apply the properties of operations to fluently compute with rational numbers in any form.
* I can use mental math and estimation strategies to determine if my solution is reasonable.
* I can use a variable to represent an unknown quantity.
* I can write a simple algebraic equation (in the form px + q = r and p(x + q) = r,) to represent a real world problem.
* I can solve a simple algebraic equation by using the properties of equality or mathematical reasoning.
* I can compare an arithmetic solution to an algebraic solution.
* I can write a simple algebraic inequality (in the form px + q >r and p(x + q) < r,) to represent a real world problem.
* I can solve a simple algebraic inequality and graph the solution on the number line.
* I can describe the solution to an inequality in relation to the problem.
* I can construct simple equations and inequalities to solve problems by reasoning about the quantities.

Equations and Expressions Unit 2 Plan

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| --- | --- | --- | --- | --- |
| *Topics* | *Day(s)* | *Date* | *Learning Target* | *Possible Lessons* |
| Pre-assessment | Day 1 | 10/14 | I can persevere in solving problems. | Pre-assessment |
| Introduction | Day 2 | 10/15 | I can write a simple algebraic equation (in the form px + q = r and p(x + q) = r,) to represent a real world problem. | Engage NY - Lesson 7  Understanding Equations |
| RWE Introduction | Day 3 | 10/16 | I can persevere in solving problems  I can solve real-world problems using rational numbers in any form, including those problems involving multiple steps. | Read articles on Debt and Credit Cards & Discuss  Introduce RWE Task #1 - Cost of Credit |
|  | Day 4 | 10/19 | I can solve real-world problems using rational numbers in any form, including those problems involving multiple steps. | Complete Task #1 - Situation #1 (1a-b); go over with whole class |
| Order of Operations & Properties of Operations | Day 5 | 10/20 | I can apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. | Order of Operations Notebook file Operation Central  Krypto Game |
| Order of Operations & Properties of Operations | Day 6 | 10/21 | I can use the commutative and associative properties to add linear expressions with rational coefficients. | [ISBE Spoons](http://www.livebinders.com/play/play?id=953710#anchor)  [Commutative-Associative Properties](http://www.livebinders.com/play/play?id=953710#anchor)  [ISBE Rewriting Expressions](http://www.livebinders.com/play/play?id=953710#anchor)  [Adding and Subtracting Expressions](http://www.livebinders.com/play/play?id=953710#anchor) |
| Order of Operations & Properties of Operations | Day 7 | 10/22 | I can use the distributive property to add and/or subtract linear expressions with rational coefficients. | Distributive Property Using Modes from ISBE  Expanding and Factoring Expressions from ISBE |
| Equivalent Expressions | Day 8 | 10/23 | I can use equivalent expressions to understand the relationships between quantities. | HCPSS Let’s Paint  CCGPS Distributing and Factoring Area |
| Writing Expressions and Equations | Day 9 | 10/26 | I can use a variable to represent an unknown quantity.  I can write a simple algebraic equation (in the form px + q = r and p(x + q) = r,) to represent a real world problem. | Deconstructing Word Problems - Georgia Task |
| Solving equations | Day 10 | 10/27 | I can apply the properties of operations to fluently compute with rational numbers in any form.  I can solve real-world problems using rational numbers in any form, including those problems involving multiple steps. | RWE Task #2 - Situation #1 (1c-d) - Cost of Credit |
| Solving equations | Day 11 | 10/28 | I can use mental math and estimation strategies to determine if my solution is reasonable. | CCGPS Algebra Magic |
| Solving equations | Day 12 | 10/29 | I can solve a simple algebraic equation by using the properties of equality or mathematical reasoning. | CCGPS – Guess my Number/  HCPSS Shop Smart/  Three Truths and a Lie |
| Solving equations | Day 13 | 10/30 | I can compare an arithmetic solution to an algebraic solution. | Steps to Solving Equations |
| Solving equations | Day 14 | 11/2 | I can solve real-world problems using rational numbers in any form, including those problems involving multiple steps.  I can persevere to solve problems. | RWE Task #3 - Situation #1(2a) – Cost of Credit |
| Solving equations | Day 15 | 11/3 | I can construct simple equations and inequalities to solve problems by reasoning about the quantities. | CCGPS - TV Time and Video Games |
| Inequalities | Day 16 | 11/4 | I can 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.  I can describe the solution to an inequality in relation to the problem. | ISBE Interpreting Inequality Situations  ISBE Inequality Memory Game  ISBE Spinning the Inequality |
| Inequalities | Day 17-18 | 11/5 | I can solve a simple algebraic inequality and graph the solution on the number line. | Day 1 – Rule of 4 for Linear Equations  Day 2 – ENY Lesson 15 Graphing Solutions to Inequalities + Graphing Inequalities Foldable |
| RWE Task 4 | Day 19-20 | 11/6 | I can construct simple equations and inequalities to solve problems by reasoning about the quantities. | RWE Task 4 - Situation #2 (1a-d) – Cost of Credit |
| Inequalities | Day 21 | 11/9 | I can solve real-life and mathematical problems using numerical and algebraic expressions and equations. | **Summative Assessment** |
|  | Day 22-26 | 11/10 - 11/12 | Reteach |  |
|  | Day 27 | 11/13 | I can solve real-life and mathematical problems using numerical and algebraic expressions and equations. | *Retake Summative* |

**Vocabulary:**

Distributive Property

Commutative Property

Associative Property

Multiplicative Property of Zero

Variable

Numerical Expression

Algebraic Expression

Term

Coefficient

Constant

Equation

Inequality

Linear

Factored form

Combining like terms

Inverse operations

Evaluate

Rational number

Identity properties

Expanded form