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| Teacher | Pam Carter | | Subject | Algebra Unit | | Timeline (Dates) | | Nov – Dec |
| **Demonstrators/ Exit Standards**  **(Core Content)** | | Expressions and Equations 7.EE  **Use properties of operations to generate equivalent expressions.**  1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.  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.”*  **Solve real-life and mathematical problems using numerical and**  **algebraic expressions and equations.**  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.* 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.  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.  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?*  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(s)** | | **What is a variable and how can they help me solve math problems?** | | | | | | |
| **Guiding Questions:**  **(Objectives, Learning Targets)** | | 1. I can use powers and exponents in expressions.  2. I can use variables to write expressions and equations to represent real-world situations.  3. I can identify and apply properties of operations to add, subtract, multiply, and divide rational numbers. For example, use the commutative and associative properties, the distributive property, the multiplicative inverse property, and the multiplicative identify property in mathematics.  4. I can write and rewrite equivalent (equal) expressions to provide insight about how quantities are related in a problem. (This means I can combine like terms and factor/expand linear expressions similar to 2x + 6 to 2(x + 3) and vise versa.)  5. I can fluently solve both one-step and two-step equations with speed and accuracy.  6. I can construct equations (including equations that involve the Distributive Property) and inequalities to solve problems.  7. I can graph and interpret solutions of an inequality on a number line.  8. I can solve word problems leading to two-step inequalities with rational numbers.  9. I can compare an algebraic solution to an arithmetic solution and identify the sequence of operations used in both. (For example, the perimeter of a rectangle is 54 cm, its length is 6cm, what is the width?)  10. I can solve multi-step real-life math problems with rational numbers (fractions, decimals, integers- both positive and negative) while using tools strategically. | | | UnitVocabulary | | Inequality  Coefficient  Variable  Distributive Property  Associative Property  Commutative Property  Identity Property  Multiplicative Inverse Property  Order of Operations  Like Terms | |

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| **What products will students create to show they understand? (Formative & Summative Assessments)**  **Please attach Open Response and Rubric**. | | | | | |
| Manipulative Problem-Solving | Quizzes | Pre-Post Assessments | Daily Skills Checks -Warm-ups | Open Response |
| Vocabulary CODE | C | O | D | E |
|  | Word Wall  Vocabulary Notebook  Fist List  Task Rotation  Spider | Word Wall  Vocabulary Notebook  Task Rotation | Word Wall  Vocabulary Notebook  Task Rotation  Three’s a Crowd  Categorizing  Mastery Review | Word Wall  Vocabulary Notebook  Task Rotation  TGT |
| Hook : How will you introduce the unit to generate curiosity & excitement and connect to prior knowledge? | | | | |
| Magic Trick: Students will select a number of their choice. We will go through many operations with the number and everyone will end up with the answer five. We will show that it is math instead of magic. | | | | |
| **Thoughtful Education Strategies (Minimum of three per week) (Fifteen different strategies per semester)** | | | | | |
| **Mastery Interpersonal Understanding Self – Expressive Utility (Can be used in multiple styles)** | | | | | |

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| Fact or Fiction Categories  Spider/Fist List Memory Box  Word Association Write to learn  Word Wall Building writing  Reading for Meaning  Interactive Lecture  Group & Labeling | Reciprocal Learning  Think/Pair/Share  Give one, Get one  Collaborative Summarizing  Jeopardy | Anticipation Guides  Etch-a-Sketch  Mystery  KWL  Concept Attainment  Compare/Contrast  1,2,3,4  Yes, No, Why | Graduated Difficulty Reader’s Theatre  Comprehension Menu Vocabulary Code  Task Rotation Jigsaw  Voc Notebook 4-2-1 Free Write  Carousel Brainstorming Kindling  Boggle TGT | 1,2,3,4  Boggle  TGT  Jeopardy |
| Student Activities | | | | |
| Day 1: Order of Operations - Warm-Up  - Pre-Test: Accent on Algebra- Define and explain the order of operations in **TE: Vocabulary Notebook**  - Introduce PEMDAS (Memory sentence – Please Excuse My Dear Aunt Sally.)  - **Identify Misconceptions**: Multiplication and division have the same priority and should be evaluated as they appear from left to right. Addition and subtraction have the same priority and should be evaluated as they appear from left to right. – Do them in order!  - Model how to evaluate expression using the Order of Operations | **Day 2: Powers and Exponents / Order of Operations**  Warm-Up: 1. 7•7•7  2. 10•10•10•10•10  3. m•m•m•m  - Use white boards to practice sample equations  - Define factors, exponent, base, powers, squared, and cubed in **TE: Vocabulary Notebook**  - Ask “When will I ever need to use Exponents?”  - discuss how to pronounce powers  - Model and practice how to write repeated factors in Exponential Form (with exponents)  - Model and practice how to write powers as a product of powers (stretch it out)  - Identify special exponent rules: (any number, except 0, raised to the zero power is 1) and (any number raised to the first power is itself)  - Practice sample questions  - Model and practice evaluating expression with substitution  - ***Connect Math to Math*** – volume of a box  - Review substitution  **- FA:** Mini Quiz  HW: worksheet | Day 3: Understanding Variables - Warm-Up: review integer rules / operations with integers  -**TE: Spider List** review using order of operations to evaluate an expression.  - **TE: KWL Chart** What words / phrases / images come to mind when you hear the word ALGEBRA? (Provide students with a list of terms including: variable, equation, inverse operations, functions, expression, etc)  - Define algebra, variable, and expression in **TE: Vocabulary Notebook**  - Ask, “How can we use variables?” Provide the following scenarios:  \* “What numeric expression would tell the number of chair legs on 376 chairs?”  \* “How would you write the number of legs on any number of chairs?”  \* “Eggs in cartons?”  \* “Eyes in room?”  \* “Ears and Feet at the dairy?”  \* “Inches in feet?”  - Model and practice how to solve an expression by substituting  - **Math Whiz**  - Pre Algebra Extension: **TE: Group and Label** – Variable Cards | Day 4: Properties - Warm Up: review writing variable expressions and substitution  - Ask, “What is a Property?”  - Students will complete a **TE: Foldable** showcasing many number properties; including the Associative, Commutative, Identity, and the Multiplicative Inverse.  (Throughout the lesson, we will make connections to real life situations.)  - **FA**: **MTE: Paired Learning** Working with a partner or small group, students will match number properties with examples. | Day 5: **Distributive Property (Factor and Expand)**  **-** Warm Up: review writing algebraic expressions from verbal expressions  *-* Ask students to find evaluate the following expression:  4(2 + 5). Then ask students if they can evaluate this expression 4(x + 5)  *-* Ask, “What does it mean to distribute? For example, if I "distribute papers" to students.” (Lead class discussion to conclude that distribute means to hand out equally.)  - Define equivalent expressions and Distributive Property in **TE: Vocabulary notebook**  - Using algebra tiles, we will model the concept of distributing.  - Discuss and model the distributive property through examples  - work sample problem  - Use NCTM modeling distributive property activity  - **FA**: Exit Slip |
| Modifications | | | | |
| Students work in groups/pairs.  Preferential seating. Modified assignments. Extended time. | Students work in groups/pairs.  Preferential seating. Modified assignments. Extended time. | Students work in groups/pairs.  Preferential seating. Modified assignments. Extended time | Students work in groups/pairs.  Preferential seating. Modified assignments. Extended time | Students work in groups/pairs.  Preferential seating. Modified assignments. Extended time. |
| Student Activities | | | | |
| **Day 6 – Distributive Property**  **(Factor and Expand)**  **-** Warm Up: review writing algebraic expressions from verbal expressions  *-* Continue to do more practice problems on distributing using rational coefficients.  - **TE: Three’s a Crowd**  (show 3 examples of students’ problems and answers – students will determine which one is incorrect) | Day 7: Combining Like Terms - Warm Up: distributive property  - Check Homework  - Define term, coefficient, like terms, constant, simplest form, and simplifying the expression in **TE:** **Vocabulary Notebook**  (Show each term with the following expression: **5x + 7)**  **-** show examples and non-examples of like terms (terms that have the same variable with the same exponent)  **- TE: TGT: Math Wars –** groups of students will be racing against one another to beat the clock and see which group can “categorize” like terms the quickest  - model how to combine like terms by adding coefficients – still using integer rules (will use highlighters to assist in identifying the like terms in an expression)  - work sample problems  - connect math to math (connect combining like terms to perimeter of polygons) | Day 8: Combining Like Terms - warm-up  - formative assessment – **human like terms:** students receive a piece of construction paper with a term on it. Students will find “like” terms in the classroom and stand together. They will then combine each other to simplify.  - practice sheet from Bridge to Algebra. | Day 9: Rewriting Equations with rational coefficients - warm-up  - MTE: Create your own- Students will be shown an equation and will produce as many equivalent expressions. Ex. 2.3x = 230%x, 2x + 0.3x, 2 3/10x  - Group Puzzle: Students are given a puzzle that reinforces the topic of equivalent expressions using rational coefficients. This puzzle takes 1 ½ to 2 days. | **Day 10: Words to Expressions**  **-**warm-up  - Reveal the words into operations chart located on the flipchart. Students take time to complete the chart and then share with the class.  - use the powerpoint from textbook  - practice from textbook  High - |
| Modifications | | | | |
| Students work in groups/pairs.  Preferential seating. Modified assignments. Extended time. |  |  |  |  |
| Student Activities | | | | |
| **Day 11: One-Step Equations**  - Warm-Up: review evaluating expressions  - Define equation and inverse operations in **TE: Vocabulary Notebook**  - Visualize an Equation – fish on a scale  - ***Manipulative*** – model Addition and Subtraction Properties of Equalities with two-sided mat, cups, and counters  - Model and practice how to solve a one-step equation  **-** Work sample problems  - ***Connecting Math to Math:*** Geometry: The sum of the measures of the angles of a triangle is 180 degrees. Find the missing measure.    Measurement: The area of a rectangle is 60 feet. If the width is 12 feet, what is the length? Use an equation to find out.  -**MTE: MVP** (Students find the “*most value points*” when solving equations – isolate the variable and perform inverse operations. This will be written in student reflection log.)  HW: textbook | **Day 12: Solving Two-Step Equations**  - Warm Up: review distributive property and combining like terms  - **FA**: Review Quiz  - Define two-step equation in **TE: Vocabulary Notebook**  - Introduce and model how to solve two step equations with a flowchart and then lead into an algorithm  - Work multiple problems and practice from textbook or workbook | **Day 13: Solving Two-Step Equations**  - Warm-Up: mixed review over solving equations.  - Check homework  - Model steps on how to solve two-step problems using inverse operations and work multiple examples  - Practice problems  - **MTE: Real World Connection “**Mandy bought a DVD player. The sales clerk says that if she pays $80 now, her monthly payments will be $32. The total of cost will be $400. Solve 80 + 32x = 400 to find how many months she will make payments.” And, “Money: Suppose you have $18.75 to spend at Founders' Park. Admission is $5.50. Ride tickets are $1.50. How many ride tickets can you buy?”  - **Math Whiz: 7.EFI.C.2**  HW: worksheet | **Day 14: Writing Equations**  - Warm Up  - **MTE: Memory Box** using a graphic organizer, students will recall the words and phrases used to indicate the four operations (addition, subtraction, multiplication, and division)  Recall, that an equation is a statement that states that two expressions are equal. These expressions are joined with an equals sign. When translating equations, one should look for words like **is, equals, or is equal to** when you translate sentences into equations. Represent these words with the "=" (equals sign).  - Practice writing equations  - **MTE: Create Your Own** – Students are given a page with 9 word problems. They are to select 8 to glue on the construction paper. They will create their own equation and then solve for the solution. | **Day 15: Graphing And Interpreting Inequalities**  - Warm Up  - Review and practice using inequality symbols (<, >, <, >)  **- MTE: Real World Connections** Inequalities are used in many real-world situations. For example: If your height is more than 40 inches, you can ride the roller coaster (h > 40 in) and Kids six and under eat for free (k < 6 years)  - Model and practice writing simple inequalities  - Model and practice graphing and interpreting inequalities  - Work sample problems |
| Modifications | | | | |
| Students work in groups/pairs.  Preferential seating. Modified assignments. Extended time. |  |  |  |  |
| Student Activities | | | | |
| **Day 16: Solving Inequalities**  **-** Warm Up  - Model how to solve an inequality and graph its solution on a number line  - Special Note: When you multiply or divide each side of an inequality by a negative number, you must reverse the inequality symbol to maintain a true statement.  - Work practice problems with students showcasing their work on the board.  - Homework - worksheet | **Day 17: Writing Inequalities**  - Warm Up  - model and practice writing inequalities using real-life situations  - **MTE: Paired Learning** Tiered Questioning (all translating inequalities) | **Day 18: Writing With Variables**  - Warm Up  - Students will review writing expressions, equations (both one-step and two), and inequalities using variables. These practices will be real-world and will include the distributive property and the need to combine like terms.  - **TE: Graphic Organizer** – Variable Synthesis | **Day 19: Pause Day**  - **Lab - Online Activity Practice**  - Using data from previous quiz / exit slips / homework reflections, students will be assigned an activity according to ability / content that needs to be reviewed.  **-** Students will be presented with 3 tasks allowing them to visit web-sites and complete math drills that involve solving equations.  **Low** - Students visit sites that practice writing equations, solving one-step equations by visualizing the steps, and solving two-step equations.  **Practice –** Students will visit sites that practice solving one-and two-step equations by visualizing the steps, solving one-step equations with integers, and solving two-step equations.  **Enrichment** - Students will visit sites that practice solving two-step and multi-step equations by visualizing the steps, solving two-step equations, and combining like terms. | **Day 20: Review**  **-** Centers: Students will be given a pamphlet for the centers. They will rotate every 15 minutes and complete their pamphlet at teach center. It will review all concepts. |
| Modifications | | | | |
| Students work in groups/pairs.  Preferential seating. Modified assignments. Extended time. |  |  |  |  |
| Student Activities | | | | |
| **Day 21: Review Day**  - Warm Up  - Check Study Guide  - **TE: TGT: Jeopardy** | **Day 22: Post-Assessment**  - Accent on Algebra Multiple Choice Assessment  - Accent on Algebra Open Response | **Day 23: Post Assessment**  - Accent on Algebra Short Answer Assessment | **Day 24:** |  |
| Modifications | | | | |
| Students work in groups/pairs.  Preferential seating. Modified assignments. Extended time. |  |  |  |  |