Pacing: 4 weeks + 1 buffer week for reteaching/enrichment

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| **Mathematical Practices** |
| *Mathematical Practices #1 and #3* *describe a classroom environment that encourages thinking mathematically and are critical for quality teaching and learning.*  *Practices in bold are to be emphasized in the unit.*  **1. Make sense of problems and persevere in solving them.**  **2. Reason abstractly and quantitatively.**  3. Construct viable arguments and critique the reasoning of others.  **4. Model with mathematics.**  5. Use appropriate tools strategically.  6. Attend to precision.  **7. Look for and make use of structure.**  **8. Look for and express regularity in repeated reasoning.** |
| **Domain and Standards Overview** |
| Expressions and Equations   * Apply and extend previous understandings of arithmetic to algebraic expressions. * Reason about and solve one-variable equations and inequalities. * Represent and analyze quantitative relationships between dependent and independent variables. |

| **Priority and** Supporting **CCSS** | **Explanations and Examples\*** | |
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| **6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers.**   1. **Write expressions that record operations with numbers and with letters standing for numbers.**   *For example, express the calculation “Subtract y from 5” as 5 – y.*   1. **Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity.**   *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.*   1. **Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).**   *For example, use the formulas V = s³ and A = 6 s² to find the volume and surface area of a cube with sides of lengths = 1/2.*  6.EE.1. Write and evaluate numerical expressions involving whole-number exponents. | **6.EE.2** It is important for students to read algebraic expressions in a manner that reinforces that the variable represents a number.  • r + 21 as “some number plus 21 as well as “r plus 21”  • n • 6 as “some number times 6 as well as “n times 6”  • and s ÷ 6 as “as some number divided by 6” as well as “s divided by 6” *s*6  Students should identify the parts of an algebraic expression including variables, coefficients, constants, and the names of operations (sum, difference, product, and quotient). Development of this common language helps students to understand the structure of expressions and explain their process for simplifying expressions.  Terms are the parts of a sum. When the term is an explicit number, it is called a constant. When the term is a product of a number and a variable, the number is called the coefficient of the variable.  Variables are letters that represent numbers. There are various possibilities for the number they can represent; Students can substitute these possible numbers for the letters in the expression for various different purposes.  Consider the following expression: *x2* +5*y* + 3*x* + 6  The variables are x and y.  There are 4 terms, x2, 5y, 3x, and 6.  There are 3 variable terms, x2, 5y, 3x. They have coefficients of 1, 5, and 3 respectively. The  coefficient of x2 is 1, since x2 = 1 x2. The term 5y represent 5 y’s or 5 ● y.  There is one constant term, 6.  The expression shows a sum of all four terms.  Examples:  • 7 more than 3 times a number (Solution: 3*x* + 7)  • 3 times the sum of a number and 5 (Solution: 3(*x* + 5))  • 7 less than the product of 2 and a number (Solution: 2*x* – 7)  • Twice the difference between a number and 5 (Solution: 2(*z* – 5))  • Evaluate *5(n* + 3) – 7*n*, when *n* =  • The expression c + 0.07c can be used to find the total cost of an item with 7% sales tax, where *c* is the  pre-tax cost of the item. Use the expression to find the total cost of an item that cost $25.  • The perimeter of a parallelogram is found using the formula *p =* 2*l* + 2*w.* What is the perimeter of a  rectangular picture frame with dimensions of 8.5 inches by 11 inches.  **6.EE.1**. Examples:  • Write the following as a numerical expressions using exponential notation.  o The area of a square with a side length of 8 m (Solution: 82*m*2)  o The volume of a cube with a side length of 5 ft: (Solution: 53 ft3)  o Yu-Lee has a pair of mice. The mice have 2 babies. The babies grow up and have two babies of  their own: (Solution: 23 mice)  • Evaluate:  o 43 (Solution: 64)  o 5 + 24 ● 6 (Solution: 101)  o 72 – 24 ÷ 3 + 25 (Solution: 67) | |
| 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.6 Connecting writing expressions with story problems and/or drawing pictures will give students a context for this work. It is important for students to read algebraic expressions in a manner that reinforces that the variable represents a number.  Examples:  • Maria has three more than twice as many crayons as Elizabeth. Write an algebraic expression to represent the number of crayons that Maria has. (Solution: 2*c* + 3 where *c* represents the number of crayons that Elizabeth has.)  • An amusement park charges $28 to enter and $0.35 per ticket. Write an algebraic expression to represent the total amount spent. (Solution: 28 + 0.35*t* where *t* represents the number of tickets purchased)  • Andrew has a summer job doing yard work. He is paid $15 per hour and a $20 bonus when he completes the yard. He was paid $85 for completing one yard. Write an equation to represent the amount of money he earned. (Solution: 15*h* + 20 = 85 where *h* is the number of hours worked)  • Describe a problem situation that can be solved using the equation 2*c* + 3 = 15; where *c* represents the cost of an item  • Bill earned $5.00 mowing the lawn on Saturday. He earned more money on Sunday. Write an expression that shows the amount of money Bill has earned. (Solution: $5.00 + *n)*  • The commutative property can be represented by *a + b* = *b + a* where *a* and *b* can be any rational number. | |
| **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.*  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.* | **6.EE.3.** Students use their understanding of multiplication to interpret *3 (2 + x). For example, 3 groups of (2 + x).* They use a model to represent x, and make an array to show the meaning of *3(2 + x).* They can explain why it makes sense that *3(2 + x)* is equal to *6 + 3x.*  An array with 3 columns and *x* + 2 in each column:  ■ ■ ■  ■ ■ ■  ▌ ▌ ▌  Students interpret *y* as referring to one *y.* Thus, they can reason that one *y* plus one *y* plus one *y* ***must be*** *3y.* They also use the distributive property, the multiplicative identity property of 1, and the commutative property for multiplication to prove that *y* + *y* + *y* = 3*y*:  *y + y + y* = y x 1 + *y* x 1 + *y* x 1 = y x (1 + 1 + 1) = *y* x 3 = 3*y*  6.EE.4.Students connect their experiences with finding and identifying equivalent forms of whole numbers and can write expressions in various forms. Students generate equivalent expressions using the associative, commutative, and distributive properties. They can prove that the expressions are equivalent by simplifying each expression into the same form.  Example:  • Are the expressions equivalent? How do you know?  *4m + 8 4(m+2) 3m + 8 + m 2 + 2m + m + 6 + m*  (Continued on next page) | |
|  | Solution:   |  |  |  | | --- | --- | --- | | Expression | Simplifying the Expression | Explanation | | 4*m* + 8 | 4*m* + 8 | Already in simplest form | | 4(*m* +2) | 4(*m* +2)  4*m* + 8 | Distributive Property | | 3*m* + 8 + *m* | 3*m* + 8 + *m*  3*m* + *m* + 8  4*m* + 8 | Combined like terms | | 2 + 2*m* + *m* + 6 + *m* | 2 + 2*m* + *m* + 6 + *m*  2 + 6 + 2*m* + *m* + *m*  (2 + 6) + (2*m* + *m* + *m*)  8 + 4*m*  4*m* + 8 | Combined like terms | | |
| **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.7.** Students create and solve equations that are based on real world situations. It may be beneficial for students to draw pictures that illustrate the equation in problem situations. Solving equations using reasoning and prior knowledge should be required of students to allow them to develop effective strategies.  Example:  • Meagan spent $56.58 on three pairs of jeans. If each pair of jeans costs the same amount, write an algebraic equation that represents this situation and solve to determine how much one pair of jeans cost.   |  |  |  | | --- | --- | --- | | $56.58 | | | | J | J | J |   Sample Solution: Students might say: “I created the bar model to show the cost of the three pairs of jeans. Each bar labeled *J* is the same size because each pair of jeans costs the same amount of money. The bar model represents the equation 3*J* = $56.58. To solve the problem, I need to divide the total cost of 56.58 between the three pairs of jeans. I know that it will be more than $10 each because 10 x 3 is only 30 but less than $20 each because 20 x 3 is 60. If I start with $15 each, I am up to $45. I have $11.58 left. I then give each pair of jeans $3. That’s $9 more dollars. I only have $2.58 left. I continue until all the money is divided. I ended up giving each pair of jeans another $0.86. Each pair of jeans costs $18.86 (15+3+0.86). I double check that the jeans cost $18.86 each because $18.86 x 3 is $56.58.”  • Julio gets paid $20 for babysitting. He spends $1.99 on a package of trading cards and $6.50 on lunch. Write and solve an equation to show how much money Julio has left.  (Solution: 20 = 1.99 + 6.50 + *x*, *x* = $11.51)   |  |  |  | | --- | --- | --- | | 20 | | | | 1.99 | 6.50 | Money left over (m) | | |
| 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.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. *(as enrichment)* | 6.EE.5. Beginning experiences in solving equations should require students to understand the meaning of the equation as well as the question being asked. Solving equations using reasoning and prior knowledge should be required of students to allow them to develop effective strategies such as using reasoning, fact families, and inverse operations. Students may use balance models in representing and solving equations and inequalities. Consider the following situation: Joey had 26 papers in his desk. His teacher gave him some more and now he has 100. How many papers did his teacher give him?  This situation can be represented by the equation 26 + *n* = 100 where *n* is the number of papers the teacher gives to Joey. This equation can be stated as “some number was added to 26 and the result was 100”. Students ask themselves “What number was added to 26 to get 100?” to help them determine the value of the variable that makes the equation true. Students could use several different strategies to find a solution to the problem.  o Reasoning: 26 + 70 is 96. 96 + 4 is 100, so the number added to 26 to get 100 is 74.  o Use knowledge of fact families to write related equations: *n* + 26 = 100, 100 - *n* = 26, 100 - 26 = *n*.  Select the equation that helps you find *n* easily.  o Use knowledge of inverse operations: Since subtraction “undoes” addition then subtract 26 from  100 to get the numerical value of *n*  o Scale model: There are 26 blocks on the left side of the scale and 100 blocks on the right side of  the scale. All the blocks are the same size. 74 blocks need to be added to the left side of the  scale to make the scale balance.  o Bar Model: Each bar represents one of the values. Students use this visual representation to  demonstrate that 26 and the unknown value together make 100.   |  |  | | --- | --- | | **100** | | | **26** | ***n*** |   Examples:  • The equation 0.44*s* = 11 where *s* represents the number of stamps in a booklet. The booklet of stamps costs 11 dollars and each stamp costs 44 cents. How many stamps are in the booklet? Explain the strategies you used to determine your answer. Show that your solution is correct using substitution.  • Twelve is less than 3 times another number can be shown by the inequality 12 < 3*n*. What numbers could possibly make this a true statement?  6.EE.8.Examples:  • Graph *x* ≤ 4.   * Jonas spent more than $50 at an amusement park. Write an inequality to represent the amount of money Jonas spent. What are some possible amounts of money Jonas could have spent? Represent the situation on a number line. * Less than $200.00 was spent by the Flores family on groceries last month. Write an inequality to represent this amount and graph this inequality on a number line.   Solution*:* 200 *> x* | |
| Concepts  What Students Need to Know | Skills  What Students Need To Be Able To Do | Bloom’s Taxonomy Levels |
| * Expressions * mathematical terms   + sum   + term   + product   + factor   + quotient   + coefficient * Order of Operations * properties of operations * equivalent expressions * problems * equations * variables | * WRITE(expressions and equations) * READ(expressions) * EVALUATE (expressions) * IDENTIFY (mathematical terms) * PERFORM (Order of Operations) * APPLY (properties of operations) * GENERATE equivalent expressions * SOLVE (equations) * SOLVE (real-world and mathematical problems) | 3  2  3  1  3  3  4  3  4,5 |

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| **Essential Questions** |
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| **Corresponding Big Ideas** |
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| **Standardized Assessment Correlations**  **(State, College and Career)** |
| **Expectations for Learning (in development)**  This information will be included as it is developed at the national level. CT is a governing member of the Smarter Balanced Assessment Consortium (SBAC) and has input into the development of the assessment. |

| **Tasks from Inside Mathematics (**<http://insidemathematics.org/index.php/mathematical-content-standards>)  **These tasks can be used during the course of instruction when deemed appropriate by the teacher.**  **NOTE: Most of these tasks have a section for teacher reflection.** |
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| **TASKS—**  **Gym -** Students do not need a full understanding of 6.EE.9 to complete question #2 or 3. |

| **Unit Assessments**  **The items developed for this section can be used during the course of instruction when deemed appropriate by the teacher.** |
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