Dear Family,

The next unit in mathematics class, ***Say It With Symbols: Making Sense of Symbols***, explores the topic that beginning algebra used to focus on almost exclusively: the use of symbols. When you first began studying algebra, you probably spent most of your time learning to manipulate symbols. Chances are you didn't get a chance to think about what the symbols actually meant. This mathematics curriculum emphasizes the *meaning* behind the symbols. This helps students build their own understanding of the basics of algebra and its usefulness for solving problems.

UNIT GOALS

In *Say It With Symbols,* students learn to use symbolic expressions to represent and reason about relationships. Students also manipulate symbolic expressions into equivalent forms to access new information. The emphasis is on using the properties of numbers and properties of equality to look at equivalent expressions and the information each expression represents. In addition, students interpret underlying patterns that a symbolic equation or statement represents. Students look critically at each part of an expression and how each part relates to the original expression, its graph, its table, and the context that is modeled.

HELPING WITH HOMEWORK

You can help with your child's homework and encourage sound mathematical habits as your child studies this unit by asking questions such as:

- What expression or equation captures the underlying pattern or relationship in a context?
- How can one tell if two or more expressions are equivalent?
- What operations would transform an equation or expression into an equivalent form so the solution can be more easily determined?
- What patterns of change does the equation or expression represent?
- In what ways can symbolic reasoning help confirm a conjecture?

In your child's notebook, you can find worked-out examples from problems done in class, notes on the mathematics of the unit, and descriptions of the vocabulary words.

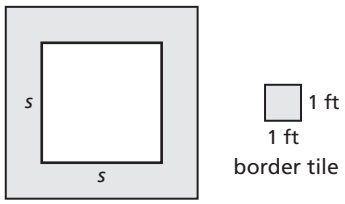
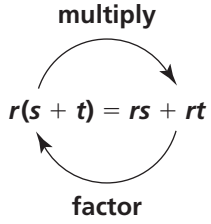
HAVING CONVERSATIONS ABOUT THE MATHEMATICS IN *SAY IT WITH SYMBOLS*

You can help your child with his or her work for this unit in several ways:

- Talk with your child about the situations that are presented and why we can rearrange symbols.
- Talk with your child about the importance of being skillful in algebra.
- Look over your child's homework and make sure that all the questions are answered and that explanations are clear.

A few important mathematical ideas that your child will learn in *Say It With Symbols* are given on the back. As always, if you have any questions or concerns about this unit or your child's progress in class, please feel free to call.

Sincerely,

Important Concepts	Examples
Equivalent Expressions Students are deliberately presented with situations in which contextual clues can be interpreted in several ways to produce different, yet equivalent, equations.	*Find the number of 1-foot-square tiles,* N*, needed to make a border around a square pool with sides of length* s *feet.* Different conceptualizations of the situation can lead to different, yet equivalent, expressions for the number of tiles: $N = 4s + 4$ $N = 4(s + 1)$ $N = s + s + s + s + 4$ $N = 8 + 4(s - 1)$ $N = 2s + 2(s + 2)$ $N = (s + 2)^2 - s^2$. 
Revisiting the Distributive Property If an expression is written as a factor multiplied by a sum of two or more terms, the Distributive Property can be applied to *multiply* the factor by each term in the sum. If an expression is written as a sum of terms and the terms have a common factor, the Distributive Property can be applied to rewrite the expression as the common factor multiplied by a sum of two or more terms. This process is called *factoring*.	 The Distributive Property allows students to group symbols (shown on the left side of the equation) or to expand an expression as needed (shown on the right side of the equation).
Checking for Equivalence Students may use contextual reasoning to decide if expressions are equivalent. Students may check whether equations have the same graphs and tables. Students should also be able to use the Distributive and Commutative Properties to show that expressions are equivalent.	By applying the Distributive Property $4(s + 1) = 4s + 4$. $8 + 4(s - 1)$ can be shown to be equivalent to $4s + 4$. $8 + 4(s - 1) = 8 + 4s - 4$ (Distributive Property) $= 8 - 4 + 4s$ (Commutative Property) $= 4 + 4s$ (Subtraction) $= 4s + 4$ (Commutative Property)
Solving Linear Equations Students have used tables or graphs to find solutions. They can solve simple linear equations using Properties of Equality. In this unit, students solve more complicated equations using Properties of Real Numbers.	$200 = 5x - (100 + 2x)$ $200 = 5x - (2x + 100)$ (Commutative Property) $200 = 5x - 2x - 100$ (Distributive Property) $200 = 3x - 100$ [Distributive Property, $5x - 2x = (5 - 2)x$] $300 = 3x$ (adding same to each side of an equation) $100 = x$ (dividing by the same on each side of an equation)
Solving Quadratic Equations Solving quadratic equations for x when $y = 0$ is equivalent to finding the x-intercepts on the graph. Students are also introduced to solving quadratic equations by factoring. The connection is made between the linear factors of a quadratic expression and the x-intercepts of the graph of a quadratic equation.	If $y = 2x^2 + 8x$, then the values of x when $y = 0$ can be obtained by rewriting the equation in the equivalent form of $2x(x + 4) = 0$. This product can be zero only if one of the factors is equal to 0. Solve $2x = 0$ and $x + 4 = 0$. Thus, $x = 0$ or $x = -4$. The x-intercepts are (0, 0) and (−4, 0). If $0 = x^2 + 5x + 6$, we write $x^2 + 5x + 6$ in factored form $(x + 2)(x + 3)$ and then solve $0 = (x + 2)(x + 3)$. Thus $x + 2 = 0$ or $x = -2$, and $x + 3 = 0$ or $x = -3$. The solutions of $x^2 + 5x + 6 = 0$ are $x = -3$ and $x = -2$.

On the **CMP Parent Web Site,** you can learn more about the mathematical goals of each unit, see an illustrated vocabulary list, and examine solutions of selected ACE problems. **http://PHSchool.com/cmp2parents**