Station # 1 (Vocabulary)

Commutative Property - May change _order_ when you add or multiply $6 + x = x + 6$

$8(9) = 9(8)$

Associative Property - May change **grouping** when you add or multiply $(6 + 3) + 7 = 6 + (3 + 7)$

$(8)(2n) = (8 \bullet 2)n$

Definition of Subtraction - | Subtraction = Add the opposite | $x - 7 = x + {}^-7$ OR $9 + {}^-1 = 9 - 1$

Multiplication Property of Zero - Multiply anything by zero, answer will be zero. $9(0) = 0$

Identity Properties - **Multiply by 1** OR **Add 0** means the number will stay the same

$8(1) = 8$ $8 + 0 = 8$

Distributive Property- Multiplier outside ( ) gets distributed to every number in the ( )

$-8(x + 3) = -8(x) + -8(3)$

For the expression   **8x – 2 – 2x + 9**, rewrite as all addition $8x + {}^-2 + {}^-2x + 9$

The addition signs separate the **terms**. | 8x | + | ‾2 | + | ‾2x | + | 9 | (**4 terms**)

We are only applied to combine **like terms**.

7x and 2x   3a and -4a   -9 and 2

Coefficients co-exist with the variable
The <u>co</u>efficient is the "multiplier"
In   **8 + 4x**   the <u>co</u>efficient is **4**

Constants are numbers NOT attached to a variable   In the expression **8 + 4x** , **8** is the <u>constant</u>.

Station #2 - (Using the Distributive Property to do Mental Math)

Study these examples :

$$3(2.25) = 3(2 + 0.25)$$
$$= 3(2) + 3(0.25)$$
$$= 6 + 0.75$$
$$= 6.75$$

$$8(2\tfrac{1}{4}) = 8(2 + \tfrac{1}{4})$$
$$= 8(2) + 8(\tfrac{1}{4})$$
$$= 16 + 2$$
$$= 18$$

Todd bought 6 notebooks and each notebook costs \$1.09. What was the total cost?

$$6(1.09) = 6(1 + 0.09)$$
$$= 6(1) + 6(0.09)$$
$$= 6 + 0.54$$
$$= \$6.54$$

$$4(2.98) = 4(3.00 - 0.02)$$
$$= 4(3.00) - 4(0.02)$$
$$= 12.00 - 0.08$$
$$= 11.92$$

Station # 3 - GCF and Factoring and Sequences

Study these examples

The GCF is the Greatest Common Factor.
   It is the largest factor that is common to all terms.
     GCF of $10x^2y$ and $4xy^2$ is $2xy$
     GCF of $8ab$ and $2a$ is $2a$

Factor means to "Please make me into a multiplication problem"
   We have looked at the strategy:
     *Find the GCF-it is one of your factors
     * "Undistribute" to get the other factor

Factor completely:

   $8ab - 6a = 2a(4b - 3)$

   $6x + 2 = 2(3x + 1)$

Sequence: 10, 16, 22, ____, ____

State the <u>rule</u> for this pattern.

     The rule is to add 6 to the previous term to get the next term.

Find the next two terms.

$22 + 6 = 28$
$28 + 6 = 34$

So, 28 and 34

If the pattern in the chart continues, what algebraic expression can be used to find the plant's height after n   months.

Month	Height(in)
1	7
2	14
3	21
n	

   Multiply the month by 7, so $7n$

Station # 4 - Evaluate algebraic expressions for a given value
AND   Evaluate numerical expressions using two methods

Study these examples.

To evaluate algebraic expressions for a given value:

*Substitute number for variable
*use order of operations agreement

Examples:

1) $a^2 + 3$ if $a = -5$

$(-5)^2 + 3$
  $25 + 3$
   $\boxed{28}$

$bc - 2a$ if $a = -3$, $b = 2$, $c = -5$

$(2)(-5) - 2(-3)$
  $-10 + {}^-2(-3)$
   $-10 + 6$
    $\boxed{-4}$

Evaluate $-8(2 + -5)$ using two methods.

Find the value

Method 1 - Order of operations

   $-8(2 + -5)$
   $-8(-3)$
    24

Method 2 - Use distributive property

   $-8(2 + -5)$
   $-8(2) + -8(-5)$
    $-16 + 40$
        24

Station # 5 - Simplify algebraic Expressions

Study these examples.

To simplify an expressions:
- * Rewrite all subtraction as "add the opposite"
- * Use the distributive property to "clear the parentheses"
- * Add and Subtract "like terms"

Simplify:

$5(-4x + 3) - 3(x - 2)$

$5(-4x + 3) + {}^-3(x + {}^-2)$

$5(-4x) + 5(3) + -3(x) + -3(-2)$

$\boxed{-20x} + \text{⟨15⟩} + \boxed{-3x} + \text{⟨6⟩}$

$\left(-23x + 21\right)$

Simplify:

$-2(-3x - 8)$

$-2(-3x + -8)$

$-2(-3x) + -2(-8)$

$\left(6x + 16\right)$

Simplify:

$-8a + 2 - b + 4a - 3b$

$\boxed{-8a} + 2 + \text{⟨-1b⟩} + \boxed{4a} + \text{⟨-3b⟩}$

$-4a + -4b + 2$

$\left(-4a - 4b + 2\right)$

Simplify:

$10x - (3x - 4) + 5$

$10x + -1(3x + -4) + 5$

$10x + -1(3x) + -1(-4) + 5$

$\boxed{10x} + \boxed{-3x} + \text{⟨4⟩} + \text{⟨5⟩}$

$\left(7x + 9\right)$

Station # 6 - Algebraic Expressions from words and pictures

Study these examples.

Find the perimeter.

$4x + 3$

$2x$
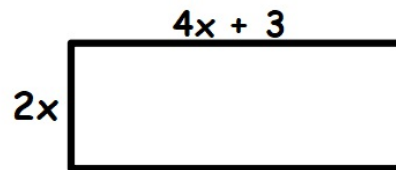
Perimeter = add up all sides

$P = (4x + 3) + 2x + (4x + 3) + 2x$

$P = \boxed{4x} + 3 + \boxed{2x} + \boxed{4x} + 3 + \boxed{2x}$

$P = 12x + 6$ units

OR

$P = 2(l + w)$

$P = 2(4x + 3 + 2x)$

$P = 2(6x + 3)$

$P = 2(6x) + 2(3)$

$P = 12x + 6$ units

It costs $3 to rent bowling shoes for the day and $5 for each game you bowl. Write the simplified algebraic expression for the cost of bowling g games.

cost = shoe rental cost + cost of g games

at $5 per game

$= 3 + 5g$

$= \boxed{5g + 3}$

Jenni buys 3 spiral notebooks that cost n dollars each and 2 binders that cost b dollars each. Write the simplified algebraic expression for the total cost.

Total cost = cost of notebooks + cost of binders

$= \boxed{3n + 2b}$