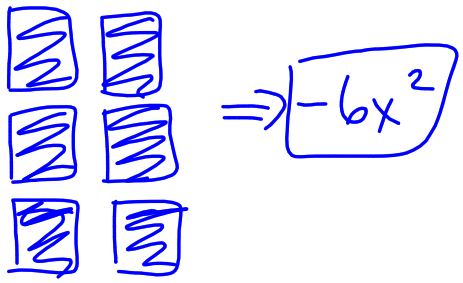
Math 9 Name: _____
Ch. 5 – Polynomials Block: ____

5.5 – Multiplying a Polynomial by a Monomial

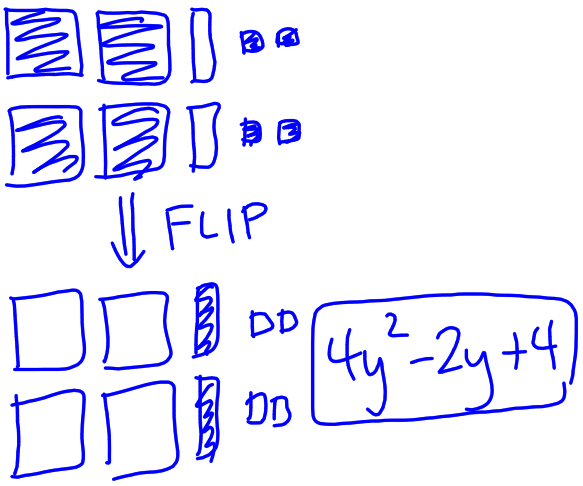
When we multiply something by say, 4, we are creating four sets of that item. For example, 4×3 means four groups of 3. The same is true when we multiply a polynomial by a constant – we are creating multiple sets of that polynomial.

Ex. 1: $3(-2x^2)$ "3 groups of $-2x^2$"

Using algebra tiles	Symbolically (algebraically)
 $\Rightarrow -6x^2$	$3(-2x^2)$ $= -6x^2$

What if we have a negative constant out front? When using algebra tiles, we ignore the negative at first, but then we have to flip the tiles to their opposite sign.

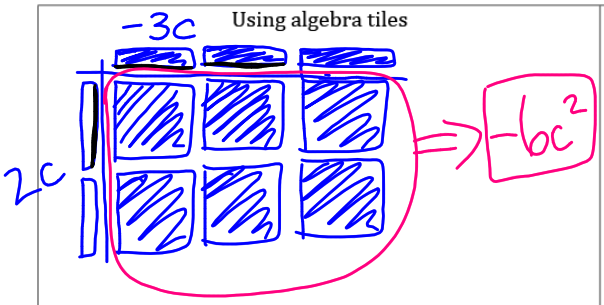
Ex. 2: $-2(-2y^2 + y - 2)$ "2 groups of $-2y^2+y-2$, then flip signs"

Using algebra tiles	Symbolically (algebraically)
 $4y^2-2y+4$	$-2(-2y^2+y-2)$ *distributive property $= -2(-2y^2)-2(y)-2(-2)$ $= 4y^2-2y+4$

What about multiplying by a monomial that isn't just a constant? Multiplication can also be thought of as finding the area of a rectangle. So, 3×6 can be interpreted as "find the area of a 3 by 6 rectangle". We can use algebra tiles by placing guiding tiles along the side and the top to represent each dimension. Then, we fill in the rectangle with tiles.

$3+3$
3^2

Ex. 3: $(2c)(-3c)$

Using algebra tiles	Symbolically (algebraically)
 $\Rightarrow -6c^2$	$(2c)(-3c)$ $= -6c^2$

Ex. 4: $-2m(3m-2)$

Using algebra tiles	Symbolically (algebraically)
 $\Rightarrow -6m^2+4m$	$-2m(3m-2)$ $= -2m(3m)-2m(-2)$ $= -6m^2+4m$

Ex. 5: Multiply symbolically:

(a) $-5y(10xy+4)$

$= -50yxy - 20y$

$= -50xy^2 - 20y$

(b) $(-3p+1r+1)(-4r)$

$= 12pr - 4r^2 - 4r$