What's Going On?

Checking In	Quick Quiz
Minds on	Multiplying Two Binomials
Action!	Special Cases
Consolidation	*It's easy as **a b**.*

Learning Goal - I will be able to recognize and perform special cases of binomial multiplication.

Concept Quiz

Copy down these four questions and answer them on a piece of lined paper. Put your name on it and hand it in.
Do the questions on your own and
SHOW YOUR WORK
(This will count for marks, but not a lot)

Expand and Simplify.

1. $(q - 2)(q + 5)$
2. $(5t - 3)(2 + 3t)$
3. $-4(x - 4)(2x - 3)$
4. $13 - 3(4y - 3)(4y + 3) - (3y + 6)(3y + 6)$

Minds on

Multiplying two Binomials

FOIL

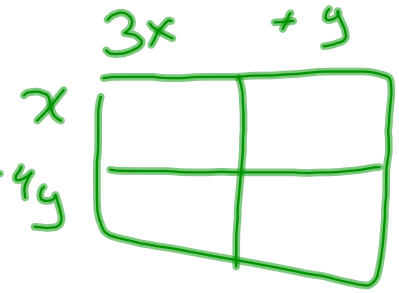
Expand and Simplify. Check with a Partner. Check the solution.

$(3x + y)(x + 4y)$

F O I L

$= 3x^2 + 12xy + xy + 4y^2$

$= 3x^2 + 13xy + 4y^2$



Minds on

Multiplying two Binomials

Expand and Simplify. Check with a Partner. Check the solution.

$(4a - b)(2a - 5b)$

$= 8a^2 - 20ab - 2ab + 5b^2$

$= 8a^2 - 22ab + 5b^2$

$8a^2 - 22ab + 5b^2$ ✓

Minds on

Multiplying two Binomials

Expand and Simplify. Check with a Partner. Check the solution.

$(-3a + 4b)(2a + 3b)$

$= -6a^2 - 9ab + 8ab + 12b^2$

$= -6a^2 - ab + 12b^2$

Need more Practice?

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Action!

Special Cases - Any Volunteers?

Come up and give it a shot!

$(x + 3)(x + 3)$	$(2y + 7)(2y + 7)$	$(3g + 2h)(3g + 2h)$
$x^2+3x+3x+9$	$4y^2+28y+49$	$9g^2+6gh+6gh+4h^2$
x^2+6x+9 ✓	✓	$9g^2+12gh+4h^2$ ✓
$x^2 + 6x + 9$	$4y^2 + 28y + 49$	$9g^2 + 12gh + 4h^2$

Action!

Perfect Squares I

Notice that in each example the binomials we are multiplying together are the same!

Because they are the same, we can write them in a more condensed form.

Any guesses??

$(x + 3)(x + 3)$ $\rightarrow$ $(x + 3)^2$

$(2y + 7)(2y + 7)$ $\rightarrow$ $(2y + 7)^2$

$(3g + 2h)(3g + 2h)$ $\rightarrow$ $(3g + 2h)^2$

Action!

$$(x + 3)^2 = x^2 + 6x + 9$$

$$(2y + 7)^2 = 4y^2 + 28y + 49$$

$$(3g + 2h)^2 = 9g^2 + 12gh + 4h^2$$

We square the first term.
We multiply both terms together **and by 2**
(we do it **twice** in the expansion)
We square the second term.

Action!

The General Case

When we square a binomial:

$$(a + b)^2 = a^2 + 2ab + b^2$$

a b a a b b

$$(3g + 2h)^2 = (3g)^2 + 2(3g)(2h) + (2h)^2$$

$$= 9g^2 + 12gh + 4h^2$$

Action!

What About Negatives?

Come up and give it a shot! a b

$(x - 3)(x - 3)$	$(2y - 7)(2y - 7)$	$(3g - 2h)(3g - 2h)$
$x^2 - 6x + 9$	$4y^2 - 28y + 49$	$9g^2 - 12gh + 4h^2$

Action!

What About Negatives?

$-3^2 = -9$

$(-3)^2 = 9$

$+$

$(x + 3)^2 = x^2 + 6x + 9$

$(2y + 7)^2 = 4y^2 + 28y + 49$

$(3g + 2h)^2 = 9g^2 + 12gh + 4h^2$

$-$

$(x - 3)^2 = x^2 - 6x + 9$

$(2y - 7)^2 = 4y^2 - 28y + 49$

$(3g - 2h)^2 = 9g^2 - 12gh + 4h^2$

ONLY THE SIGN ON THE MIDDLE TERM HAS CHANGED!!

Action!

Perfect Squares II

Notice that in each example the binomials we are multiplying together are the same! **AGAIN**

Only this time, the binomials have a negative sign.
Again, we can rewrite in a more condensed form!
Any guesses??

$(x - 3)(x - 3)$ $\rightarrow$ $(x - 3)^2$

$(2y - 7)(2y - 7)$ $\rightarrow$ $(2y - 7)^2$

$(3g - 2h)(3g - 2h)$ $\rightarrow$ $(3g - 2h)^2$

Action!

The General Case

When we square a binomial:
(IF THERE IS SUBTRACTION)

$$(a - b)^2 = a^2 - 2ab + b^2$$

a b a a b b

$$(3g - 2h)^2 = (3g)^2 - 2(3g)(2h) + (2h)^2$$

$$= 9g^2 - 12gh + 4h^2$$

Action!

Difference of Squares

The signs are different! Come up and give it a shot!

$(x + 3)(x - 3)$	$(2y + 7)(2y - 7)$	$(3g + 2h)(3g - 2h)$
$x^2+3x-3x-9$	$(4y^2-49)$	$9g^2 - 4h^2$
x^2-9		
$x^2 - 9$	$4y^2 - 49$	$9g^2 - 4h^2$

Action!

The General Case

When we have a **difference of squares**:

$(a + b)(a - b) = a^2 - b^2$

opposing signs

$(3g + 2h)(3g - 2h)$

These cancel eachother out!

$= 9g^2 - 6gh + 6gh - 4h^2$

GONE, KAPUT, SEE YA!

$= 9g^2 - 4h^2$

Action!

Summary Slide

To square a binomial, use one of the following patterns.

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$(a - b)^2 = a^2 - 2ab + b^2$$

To find the product of the sum and difference of two terms (a difference of squares) use the following pattern.

$$(a + b)(a - b) = a^2 - b^2$$

Consolidation

Homework

WRITE IN YOUR LOG

Pg. 137

8 (cde)

11 (test worthy)

Pg. 143

1-8 (e, f in each)

16 (ALL)

After you do these questions, if you don't get it, TRY SOME MORE!