Activity/Lesson:

PRIOR KNOWLEDGE

When teaching binomial multiplication, be sure to:

Teach using algebra tiles (if you plan to show factoring with algebra tiles)

Teach using area model with a generic rectangle

Teach using F.O.I.L

Teach using multiple distribution (helpful to reinforce distributive property)

Begin by Building a Flowchart

Initially, students can be taught to factor quadratic expressions step-by-step while building their own flowchart. A complete flowchart can be seen on the WCCUSD math department website under the Content Presentations tab. Click on the link for Algebra I and the flowchart is the last part of the presentation : GCF, Multiple Methods for Factoring Trinomials, Difference of Squ

Teach students to look for the GCF of the terms even though most of the time it will be 1 when students first start factoring. Teaching this from the beginning will instill a habit of looking to factor out the GCF first.

If there is no GOF other than 1, students can then move to the next step.

Once we actually start factoring out a GCF, It is important to teach students that they have to factor out the GCF first; only that this practice will make the process of factoring the quadratic expression simpler.

Activity/Lesson continued

You Try 1:

Factor x^2 19x 60 completely. Use guess and check with an area model and algebraically.

If needed students can still use a product/sum chart. The goal is for students to develop their number sense and intuition to factor quadratics without using a product/sum chart.



Area Model using a Generic Rectangle	Algebraically
x^2 19x 60	x^2 19x 60

Activity/Lesson continued

Things to teach explicitly

USING THE MIDDLE TERM TO GUESS MORE EFFECTIVELY

x^2 61x 60	x^2 59x 60	x^2 59x 60
x x	x x	x x
x^2 32x 60	x^2 28x 60	x^2 28x 60
x x	x x	x x
2 22 50	2 1 - 10	
$x^2 = 23x = 60$	$x^2 = 17x = 60$	
x x	x x	
r^2 19x 60	r^2 11r 60	r^{2} 11r 60
x 17x 00	r r r	r r
Λ Λ	л л	Λ Λ
x^2 17x 60	x^2 7x 60	x^2 7x 60
x x	x x	x x
2	2	
x^2 16x 60	x^2 4x 60	
x x	x x	
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 $\underline{You Try 3}$: Factor the following expressions completely. Pay attention to the affect the middle term has on the factors.

What do you notice about how the middle term of the trinomial affects what factors you try first?

Discuss the closer the middle term is to zero in the trinomial, the closer the factors will be in the binomials.

Also, discuss the relationship between the sign of larger factor in the binomial and the sign of the middle term from the trinomial for the last two columns. When the last term of the trinomial is negative, the sign of the larger factor in the binomials should match the sign of the sum (note again this is only always true when a = 1).

By choosing a trinomial whose first term is x^2 , and whose last term is 60, it will help students understand how to make better guesses about which factors to use. Also, by choosing the number 60 which has 12 whole number factors, and varying its sign, students will have the ability to factor 24 similar trinomials. Factor the following expression using guess and check with an area model and algebraically.

x^2 5x 24

Guess & Check				
Area Model	Algebraically			

HANDOUT

Factor the following 24 expressions. Be ready to discuss how we know the signs of the binomials and how the middle term of the trinomial helps you decide which factors of 60 to use.

x^2 61x 60	x^2 61x 60	x^2 59x 60	x^2 59x 60
x x	x x	x x	x x
x^2 32x 60	x^2 32x 60	x^2 28x 60	x^2 28x 60
x x	x x	x x	x x
x^2 23x 60	x^2 23x 60	x^2 17x 60	
x x	x x	x x	
x^2 19x 60	<i>x</i> ² 19 <i>x</i> 60	x^2 11x 60	x^2 11x 60
x x	x x	x x	x x
x^2 17x 60	x^2 17x 60	x^2 7x 60	x^2 7x 60
x x	x x	x x	x x
x^2 16x 60	x^2 16x 60	x^2 4x 60	
x x	x x	x x	