DAY 3: More Multiplying Polynomials & The Factor Game with Integers

Materials

Copies:	3.1 Multiplying Polynomials with an Area Model- Part 2 3.2 Monomial Factor Game with Integers Ticket out the Door Day 3
Supplies:	Algebra Tiles- 1 set of *positive tiles* per pair of students Paperclips- 2 per group of 4 2-color counters- about 15 per group of 4

Objective

Students will use an area model with Algebra Tiles to multiply monomials, binomials and polynomials. Students will play the factor game to improve efficiency in multiplying monomials.

Student Talk Strategy

Inside-Outside Line for conclusion to 3.1 (#10)
Report to a Partner for the Factor Game

Academic Language Use

Height- For this unit, height will refer to the vertical distance of a rectangle. The teacher will define this when introducing activity sheet 1.1 and model throughout.

Base – For this unit, base will refer to the distance across or the horizontal distance of a rectangle. The teacher will define this when introducing activity sheet 1.1 and model throughout.

Area- The number of squares it takes to cover a rectangle. The teacher will introduce and model this by having the students count squares on graph paper.

Dimensions- In this unit, the two numbers being multiplied, the factors, will be used to represent the dimensions, or the base and height of a rectangle. This term will be introduced and modeled by the teacher throughout.

Factors- In this unit, the two numbers being multiplied, the length and width of the rectangle, will be called factors. This will be modeled by the teacher throughout.

Product- In this unit, the answer to the multiplication problem, also the same as the area of the rectangle, will be referred to as the product. This will be modeled by the teacher throughout.

Activity Notes

35 minutes: Multiplying polynomials with an area model- Part 2

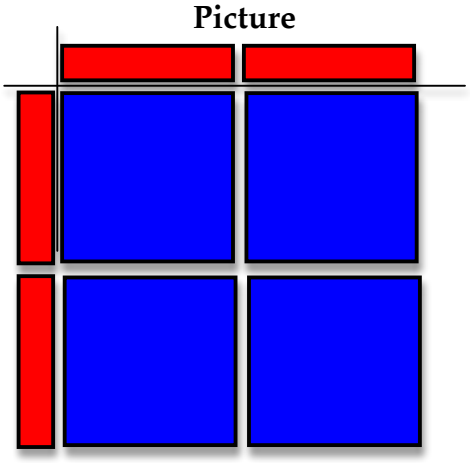
If the last lesson went well, begin today by having pairs (or individuals if you have enough tiles) work on activity sheet 3.1. Pass out the tiles and the sheet and have students 1st build the base and height with red tiles and then fill in the area with blue tiles. Once this is done, have them draw a picture and write the equation. Circulate to

ensure students are setting up the tiles correctly and questions students as to why they put a particular tile where they did; i.e., How do you know that an x by x makes an x^2? Before having the students work independently, have the class look at problems 5 and 6. Use Think-Pair-Share to have the students tell a neighbor and then the class what $(2x+1)^2$ means. Make sure the students write out $(2x + 1)(2x + 1)$. Repeat the same process for #6. Set the timer for 20 minutes to allow students to solve problems 1-9. Then, use purposeful selection to have students come share either the work with the tiles of their picture. Save 10 minutes at the end of this activity for problem #10 (see below example).

1.

Problem

$2x \bullet 2x$

Picture	Equation
	$2x \bullet 2x = 4x^2$

#10- Last 10 minutes of this section.
Have the students look at problem #10. Give them 2 minutes to silently look at it and think about/solve it. They should use tiles to help, unless they can already picture this in their head. At the conclusion of the 2 minutes, number off the class into 1's and 2's. Have the class form two lines, with the 1's facing the 2's. Have the students bring their page or a method to share what they wrote for #10. Use the Inside-Outside Line to have the 1's and 2's share their responses to number 10. Give each partner 1 minute to talk. After 2 minutes, have the 1's move down 1 place so everyone has a new partner to share with. Repeat this one more time so that everyone has talked with 3 people. Have the class return to their seats and call on a student to summarize while you record.

20 minutes: Monomial Factor Game with Integers
Pass out activity sheet 3.2. Put up the game board make sure the students recall the rules. Ask the students to look at the factor choices to see if they notice what is different today. Hopefully they realize there are now negative numbers. Direct the students' attention to the bottom of page 1. Give the class 3 minutes to complete the blanks on the review section (they can work with a partner if they wish). Then, select a student at random to answer each one and record these "rules" on the board so all can see while you play.

Play one whole class game. To do this, divide the class into 2 groups and select a representative for each group (who will tell you where to place the paperclips). Give each team a maximum of 45 seconds to decide.

After the whole class game, have students form groups of 4 and have a representative from each group come up to get the 2-color tiles or chips and 2 paperclips. Have 2 students form a team to play against the other 2 students. Have the two students in each team take turns deciding where to move the paperclip by using Report to a partner to first explain their thoughts and then to decide on the move. The groups can continue play until 5 minutes are left in the class session.

5 minutes: Ticket out the Door
Pass out the Ticket out the Door and collect it as soon as each student finishes (so that you can discuss mistakes with students as they turn it in).