Transcript – Open Arrays

Open arrays provide a graphic organizer for multiplying whole numbers, decimals, fractions, and algebraic expressions.

An understanding of how to multiply two binomials may be built on an understanding of how to multiply two whole numbers.

In elementary grades, students may use manipulatives, such as base 10 blocks, to develop an understanding of magnitude when multiplying and the algorithm for multiplication.

This graphic represents the product of 12 and 11 using base 10 blocks.

Students begin to move from thinking with only units to thinking of a collection of 10 units as "tens," drawing a rod to represent a set of 10. A unit is still represented by a unit square.

Students begin to move from thinking with only units to thinking of a collection of 10 tens-units as "hundreds," drawing a large square to represent a product of 10 and 10 to make 100. A unit is still represented by a unit square.

Students then move to an open array where lengths are labeled with numbers, and the area of the resulting rectangle represents the products of these parts of the two factors.

Let's consider these three arrays.

We will use each array to represent the product of 12 and 11. As you observe the progression in representations, consider the implications for supporting students who are struggling to develop fluency with multiplying binomials and factoring trinomials.

To continue in this manner would not contribute to the efficiency part of fluency, so students move to think in terms of sketching the base 10 blocks with the same numerical thinking.

Students will continue to progress to a more generalized array.

Students will continue to progress from the more generalized array to the standard algorithm.

How might building on an open array representation support students as they work to develop fluency with multiplying binomials?