Multiplication "Tables"

Develop a strategy to represent 67 x 83 without actually drawing or making a rectangle.

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Discussion, Suggestions, Possible Solutions

In the previous task, students have studied how to represent multiplication of two 2-digit numbers using a rectangular model. In this task, they will move beyond manipulatives to begin using numerals only to represent multiplication of two 2-digit numbers.

Ask students to represent (or by drawing) 67x83. *[Anticipated students' response: "That's too large." "That will take a long time." "We don't have enough blocks." etc.]*

Here is a vignette of how class discussion may evolve.

Teacher: How many sections did we have when we were there in a rectangle when we modeled multiplication of 2-digit numbers
Students: Four.
T: So, how many sections do you think there will be for 67 x 83*?*
S: Four!
T: Which blocks will you be using in each part?
Ss: Hundred-blocks forTENSxTENS, Ten-blocks for ONESxTENS and TENSxONES, and Unit-blocks for ONESxONES.
T: How do you know how many of each block you will be using?
Ss: Multiplying the numbers in each place.
T: Can you organize the number of each blocks you will need in each segment us?
Ss: We can make a "table"

	6 TENS	*7 ONES*
8 TENS	*48 Hundred-blocks*	*56 Ten-blocks*
3 ONES	*18 Ten-blocks*	*21 Unit-blocks*

T: So what number is 48 Hundred-blocks?

Ss: 4800.

T: Can we use numbers instead of showing how many blocks of what type?

Ss: Yes.

	60	*7*
80	*4800*	*560*
3	*180*	*21*

T: So how do you find the product?

Ss: Add 4800, 560, 180, and 21 together. It's 5561.

Ask students to represent other multiplication of two 2-digit numbers using these multiplication "tables."

Extension:

Ask students how they might use the multiplication "table" to represent 123x33. *It will look like*

	100	*20*	*3*
30	**A**		
3	**B**		

Student should understand how to complete the table except (A) and (B). Ask students to figure out how these two cells should be completed.

Some students may notice that (B) should be 300 since it's 3x100, *or 3 groups of 100. Ask them how* 3x100 *and* 30x100 *are related. [*30x100 *is ten times of* 3x100. *So,* 30x100 *must be 3000.*]

Continue the discussion to generalize that HUNDREDSxTENS=THOUSANDS, and HUNDREDSxONES=HUNDREDS.

In a similar manner, you may want to extend the method to multiplication of two 3-digit numbers.

Another important extension is to help students move to a paper-and-pencil algorithm. For example, here are two possible algorithms.

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  67
x 83
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4800
 560
 180
  21
----
5561
```

```
 52
  67
x 83
----
 201
536
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5561
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