

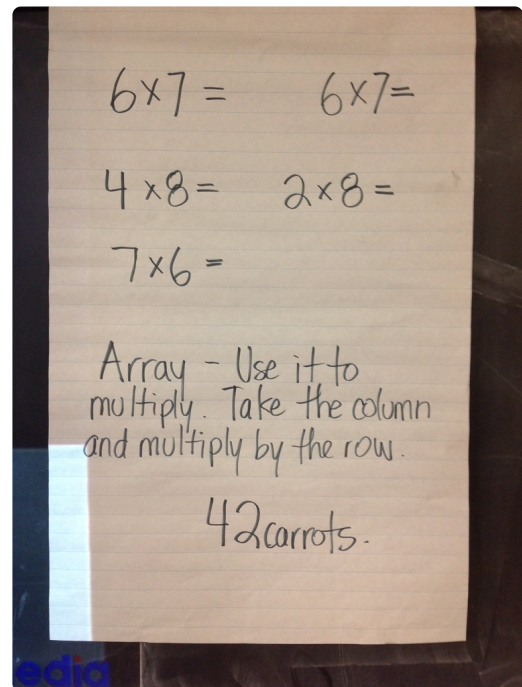
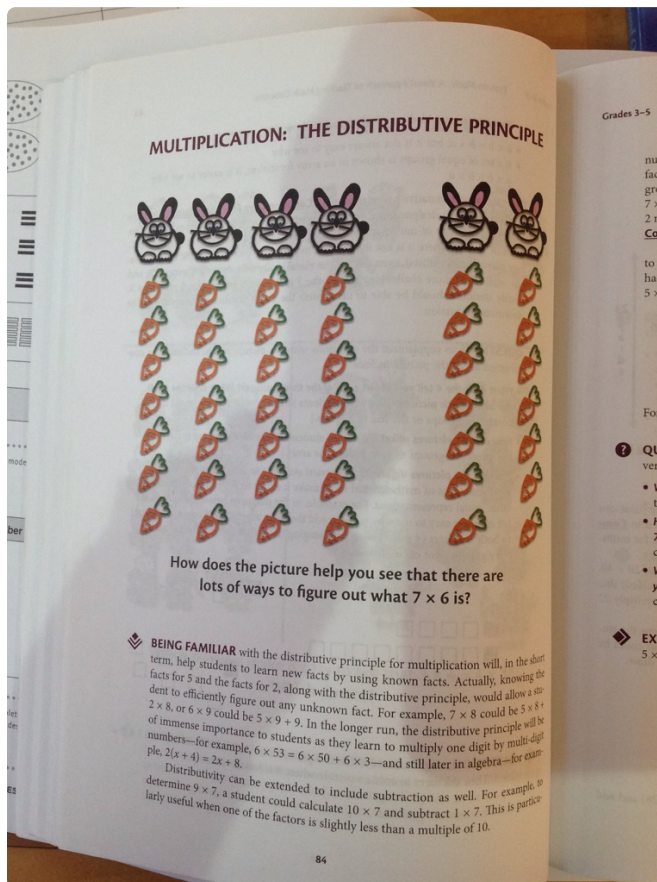
We are learning how to figure out facts we don't already know, or to double check facts we do know, using arrays and the Distributive Property.

Minds On

What multiplication does the picture show?

Turn and talk

-discuss, then ask, do you include the bunnies in the array? Turn and talk...



Working On it

In partners, how can you rearrange the rows and columns to find other ways to figure out 7×6 ?

5 Practices for Orchestrating Productive Mathematics Discussions-Anticipation Organizer

Strategy	Key Questions to Ask	Who and What	Order
• skip counting by (6, 7, 5's, 2's)	Is there a faster way that you could count the carrots?		
• repeated addition	Are there other ways you could group the carrots? Other ways to add up the carrots?		
• using a known fact eg $4 + 28$ (2×7) (4×7)	Are there other facts that you know that could help you?		
• partial products (7×2) + (7×2) + (7×2) $14 + 14 + 14$	Are there other ways you could group the carrots?		
• doubling	"		

When you double up the columns, there are less things to total up

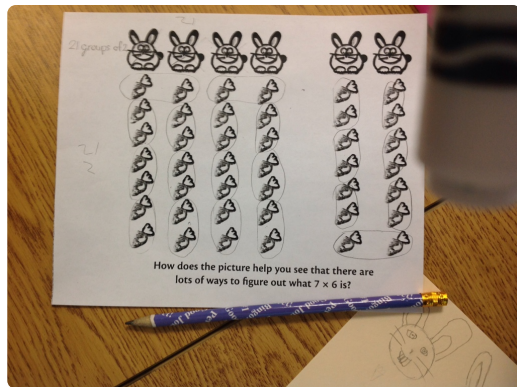
$7 \times 6 = 42$

$7 \times 2 = 14$

$14 + 28 = 42$
 $14 \quad 14$

How does the picture help you write that there are lots of ways to figure out what 2x6 is?
 $7 \times 2 = 14$ $7 \times 2 = 14$ $7 \times 2 = 14$

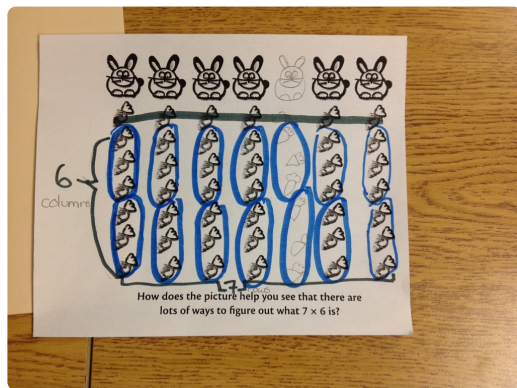
How could you write two groups of seven as a multiplication sentence



We made 21 groups of two

$$21 \times 2 =$$

Would you get the same answer as 6×7 ?

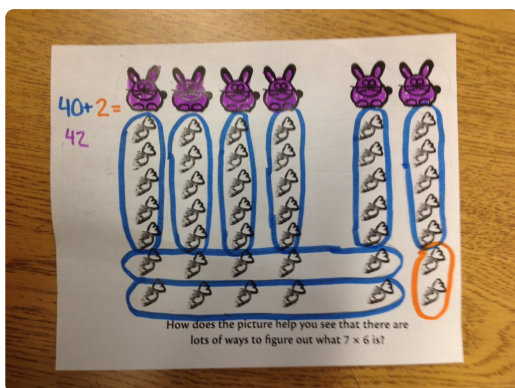


Equal groups

Crossed out the carrots at the top, moved them into a column.

-still 6×7

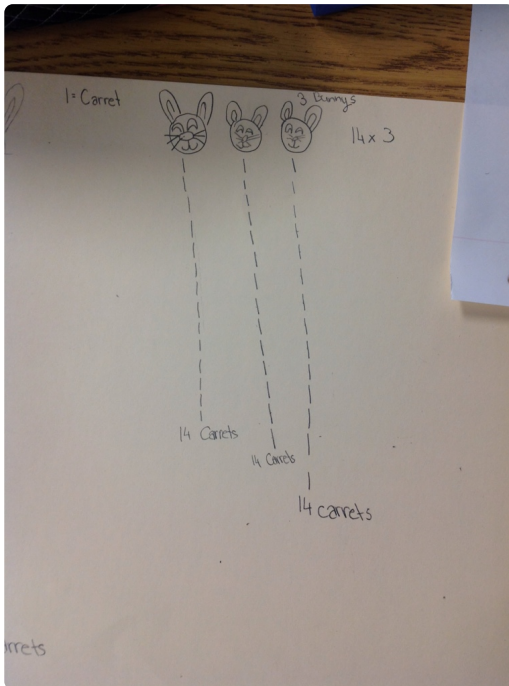
Seeing it as equal groups and repeated addition



We made groups of five, there were 8 of them, with 2 remaining carrots

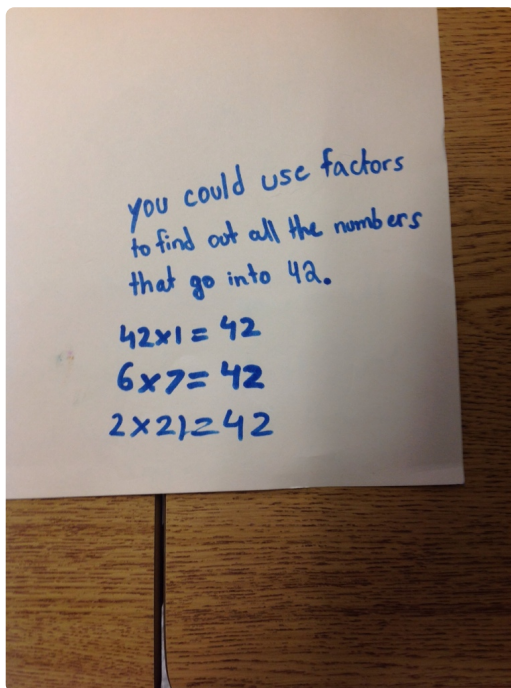
$$8 \times 5 = 40$$

$$40 + 2 = 42$$

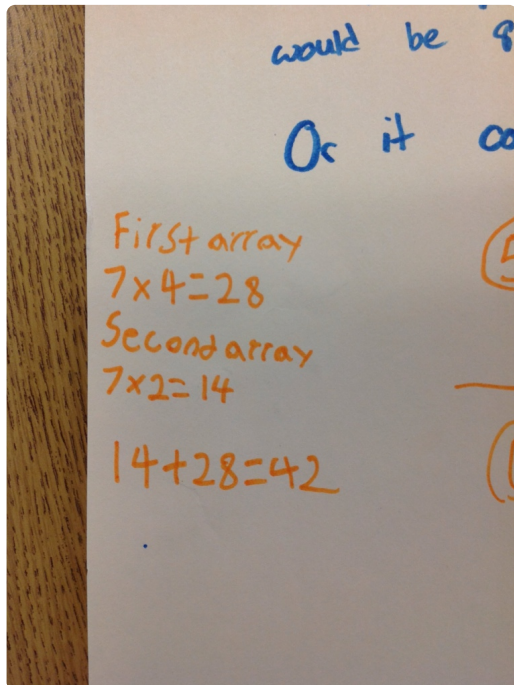


Oh, we can do 1 times 42

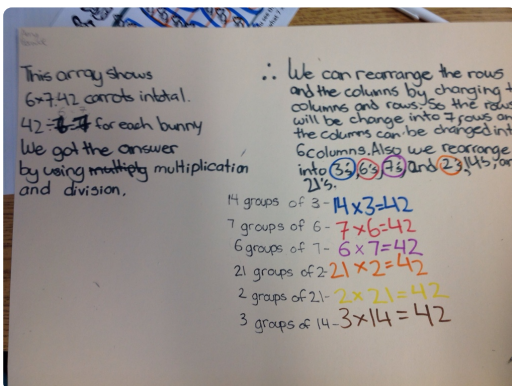
If you know 4×7 and 2×7 , it would help you to know 7×6



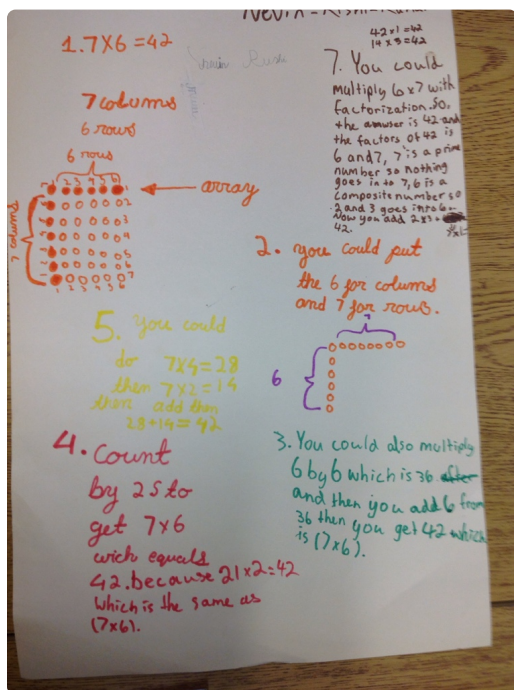
Not using the array, defaulting to memorized facts.



Partial products

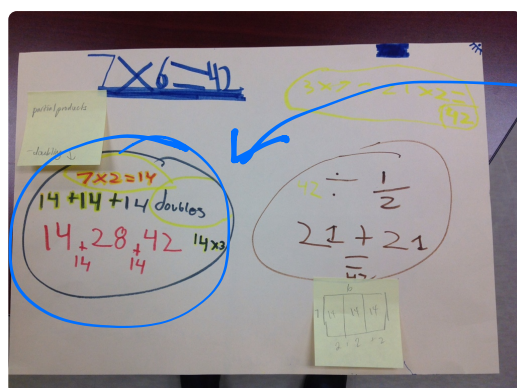


Redrawing groups and using
 memorized facts



Splitting the array and adding up partial products

The Debrief

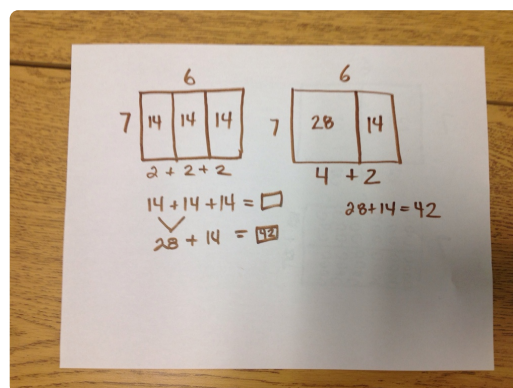


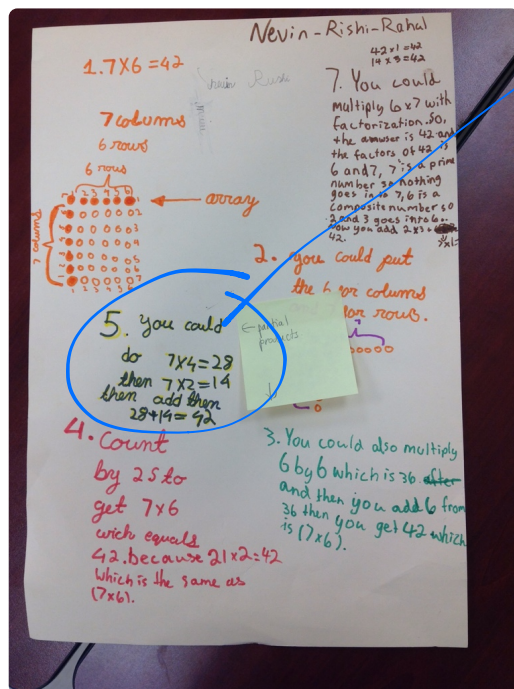
Students share their thinking on the left

-discuss doubling, and why that may be an easier way to think about 7×6
 -decomposing the 6 into $2 + 2 + 2$ and finding partial products
 $(7 \times 2) + (7 \times 2) + (7 \times 2) = 14 + 14 + 14$
 $14 \times 3 = 42$

Can someone, in their own words, tell us what this group did?

Modelling the open array as a visual model of the thinking

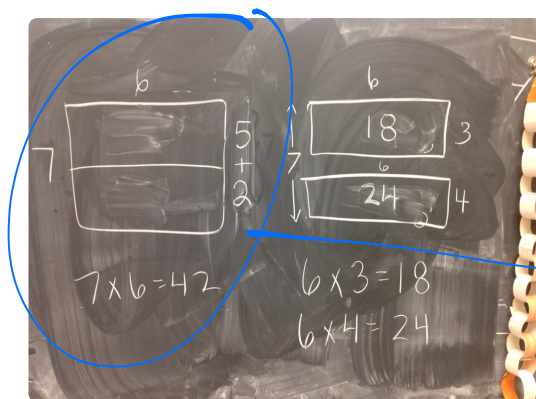
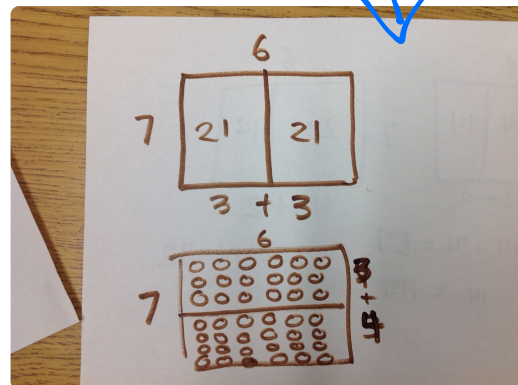




Decomposing the 6 into $(4 + 2)$

-doubling the 7, 7×2 and adding that partial product to 7×4

What other ways could we look at this array, if we don't have 7×6 as a memorized fact?



Left students thinking about decomposing the 7 into $5 + 2$, what partial products would we write into the open array?