Relating Multiplication Facts Using the Commutative and Distributive Property

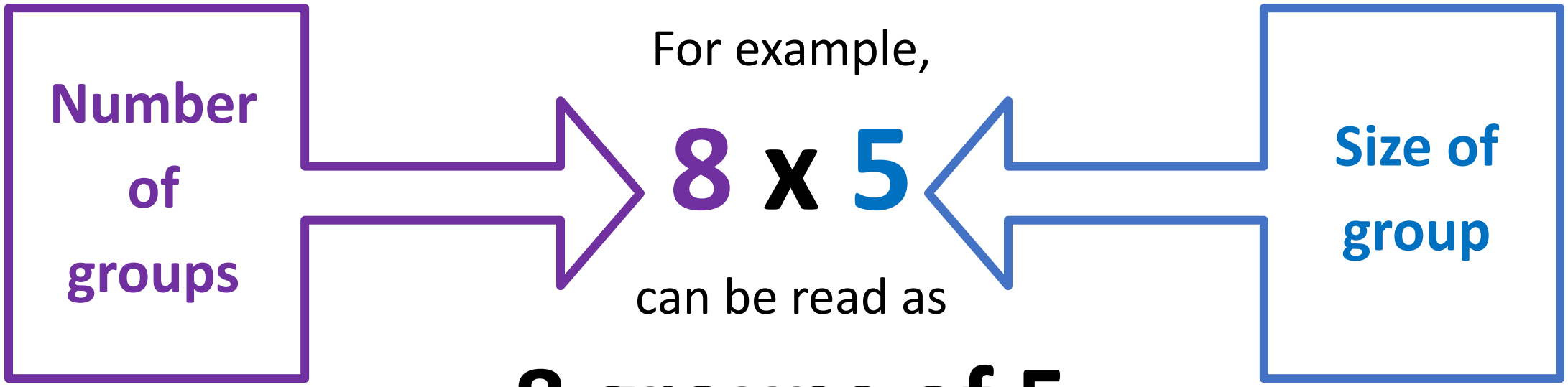
Unit 3 Lesson 2

Using Commutative and Distributive

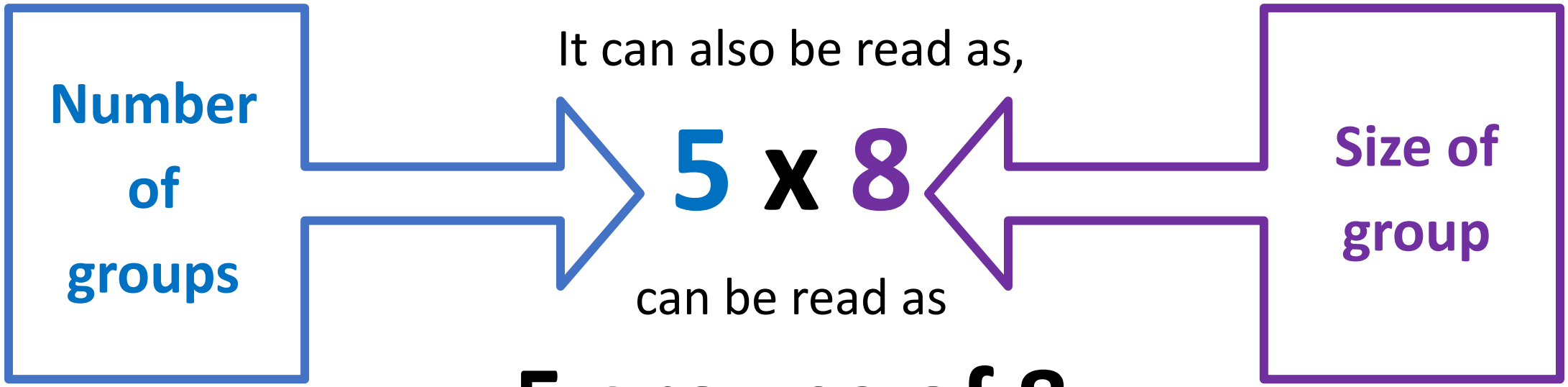
We know that the commutative property of multiplication deals with **having the same product despite the interchanging positions of factors in an expression**. Meanwhile, we know that the distributive property of multiplication deals with **breaking larger factors apart to multiply to easier facts**. With the knowledge of the commutative and the distributive properties, we can combine these strategies to easily solve for larger facts.

That means that **after interchanging the position of the factors, we can break one factor apart to distribute it afterwards**. We can take out one group from it then add it afterwards.

Using Commutative and Distributive



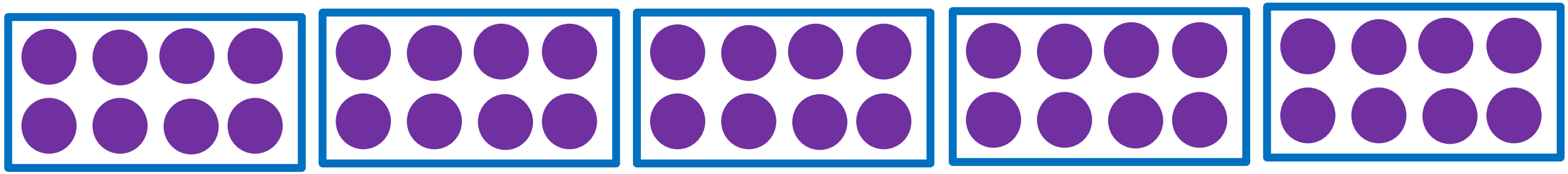
Using Commutative and Distributive



Using Commutative and Distributive

5 x 8

We can draw it as:

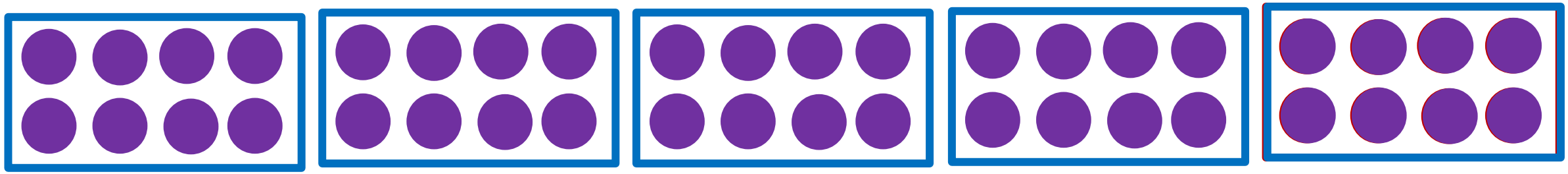


Using Commutative and Distributive

5×8

if we take out one group of 8, the expression will be

$4 \times 8 + 8$

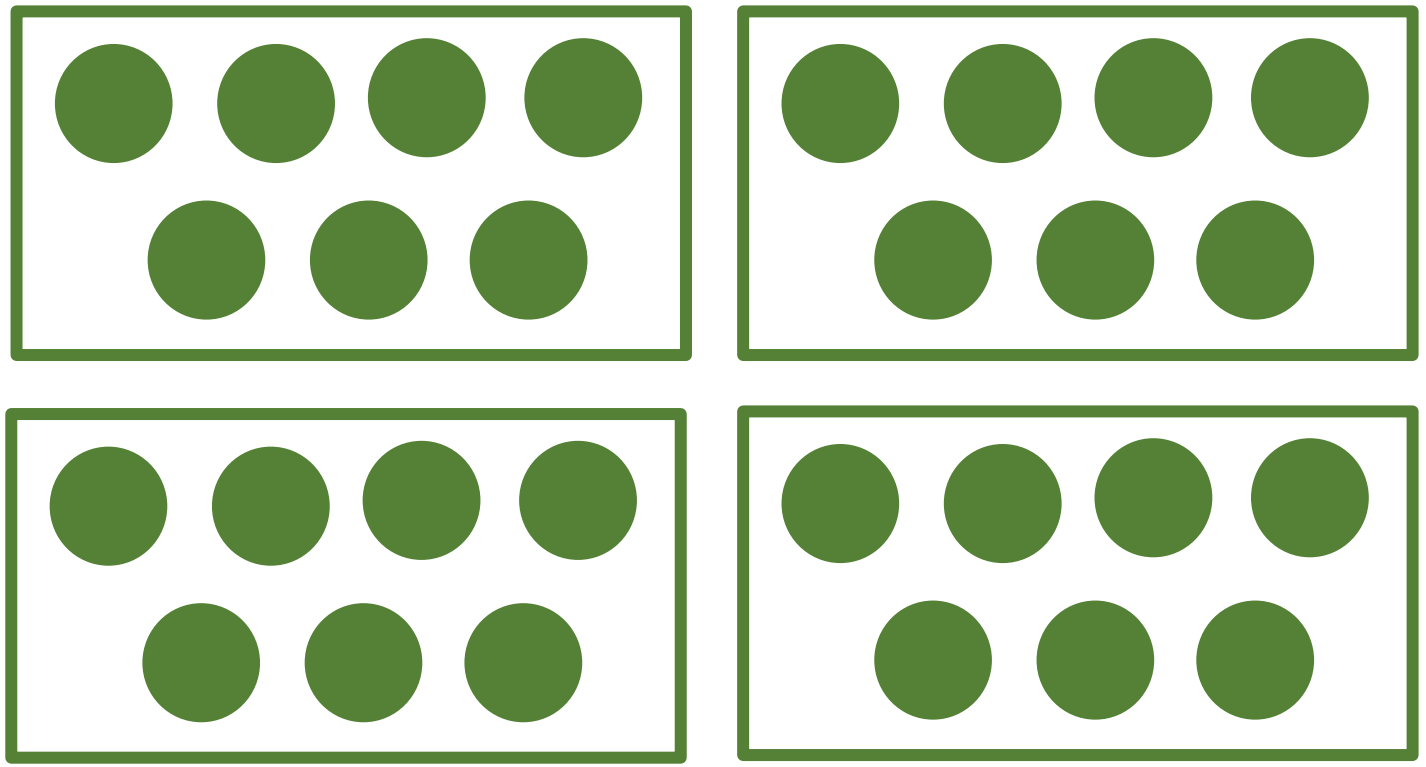


We know that 4 x 8 is equal to 32.

Then, we 32 + 8 is equal to 40.

The product of 8 x 5 is **40**.

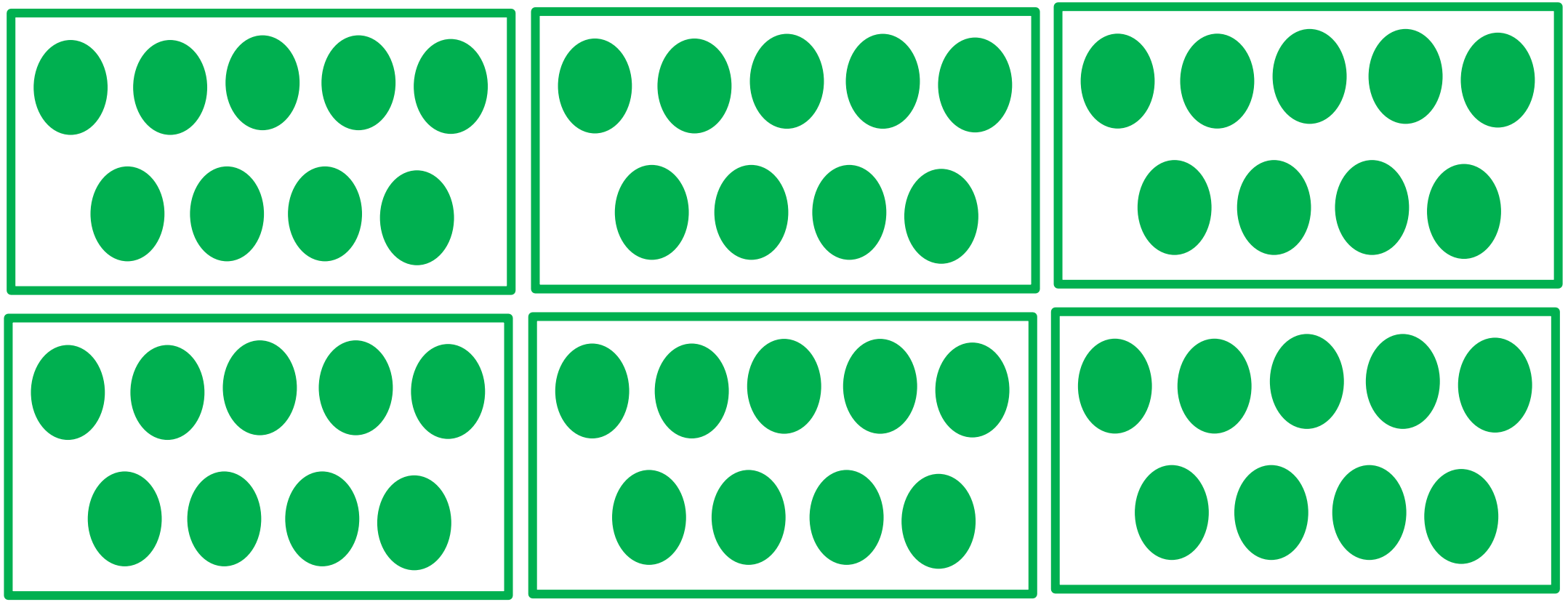
Analyze the following equal groups.



How many sevens are there?

4 sevens

Analyze the following equal groups.



How many nines are there?

6 nines

¿? Time to Think ¿?

1. **If there are 6 groups of 9, explain how many groups of 9 will be left if you take out 3 groups.**

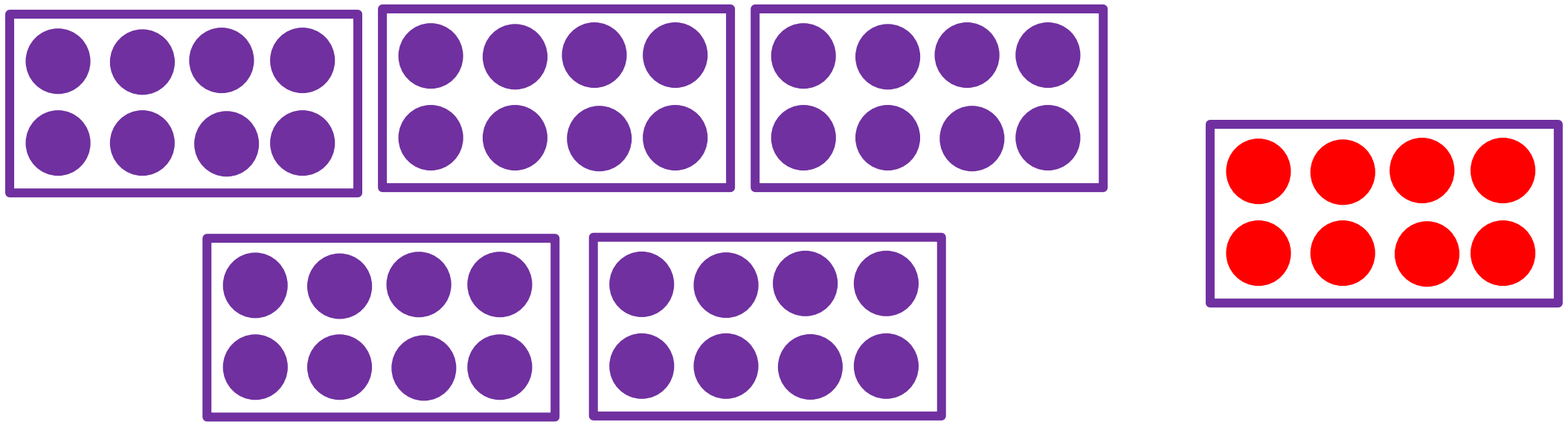
Taking out 3 groups from 6 groups of 9 will make make the number of groups to be 3 groups of 9 left.

2. **Use distribution in writing the expression of the equal groups above.**

(6 – 3) x 9 + 9 + 9 + 9 = 3 x 9 + 9 + 9 + 9

Complete the equal groups to complete the equations.

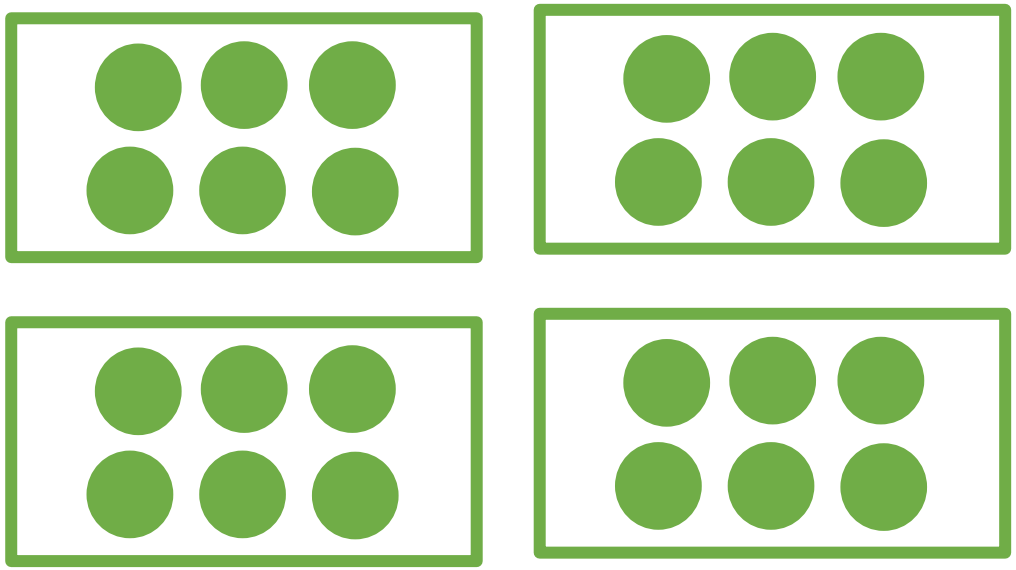
6 groups of 8

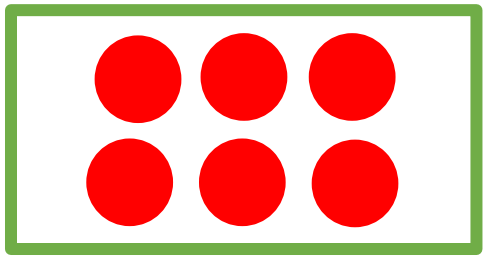


$6 \times 8 = 5 \times 8 + 8 = 48$

Complete the equal groups to complete the equations.

5 groups of 6

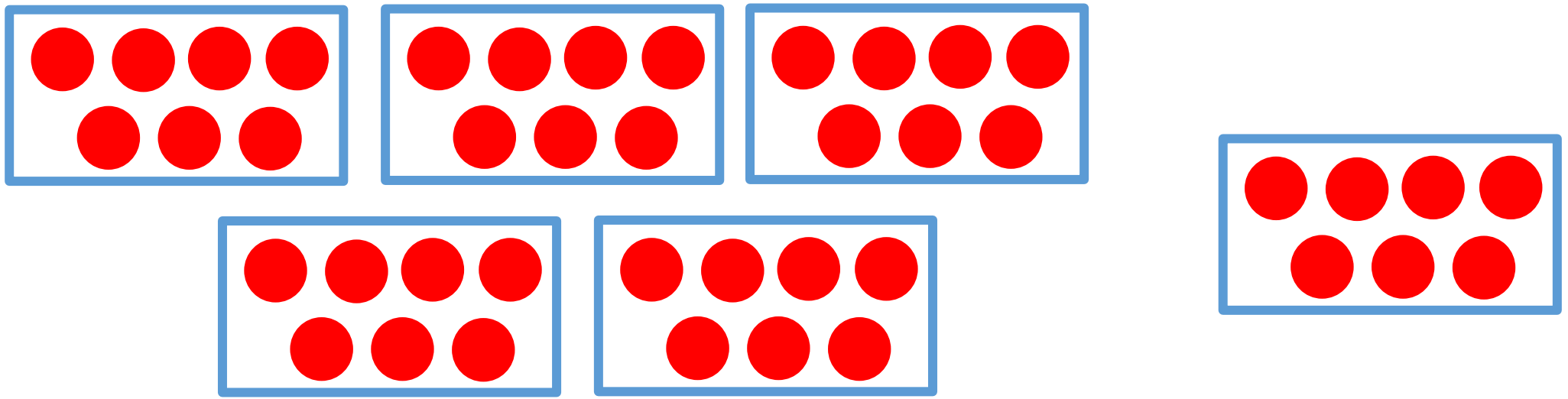




5 x 6 = 4 x 6 + 6 = 30

Complete the equal groups to complete the equations.

6 groups of 7



$$6 \times 7 = 5 \times 7 + 7 = 42$$

¿? Time to Think ¿?

1. **How can this strategy of distribution make use the known facts of 2, 3, 4, and 5?**

Breaking apart the larger factors can produce smaller factors such as 2, 3, 4, and 5. With this strategy, it will be easier to get the known facts of these smaller factors. Afterwards, we can just add the remaining broken up values to finish solving.

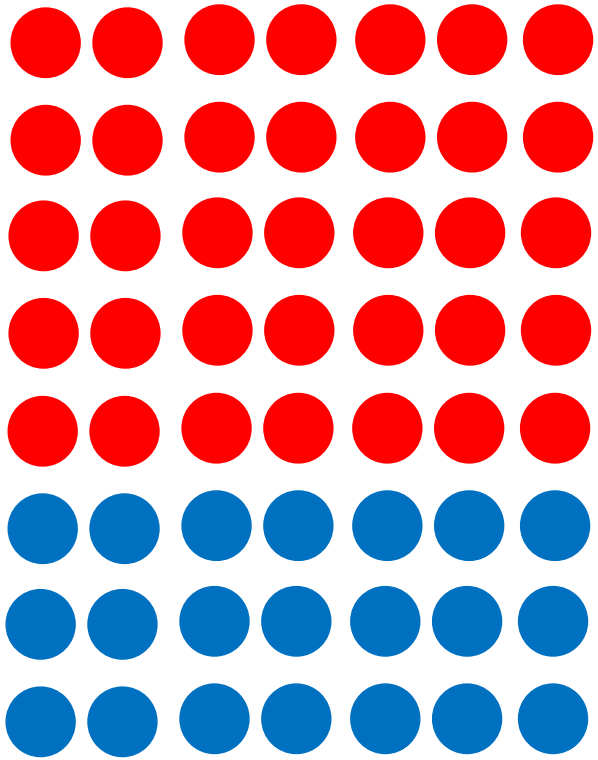
2. **How would you break apart 9 x 9 into two smaller facts of 4 and 5? Write the new expression.**

I will break apart 9 x 9 into smaller facts of 4 and 5 by understanding that 4 and 5 add up to 9. With this, I can break apart the first 9 into 4 + 5, then I will distribute the second 9 to 4 and 5. The expression will be (4 + 5) x 9 = (4 x 9) + (5 x 9).

Complete the following equations. Then, draw an array to show the distribution.

$$7 \times 8 = 8 \times 7 = (5 + 3) \times 7 = (5 \times 7) + (3 \times 7)$$

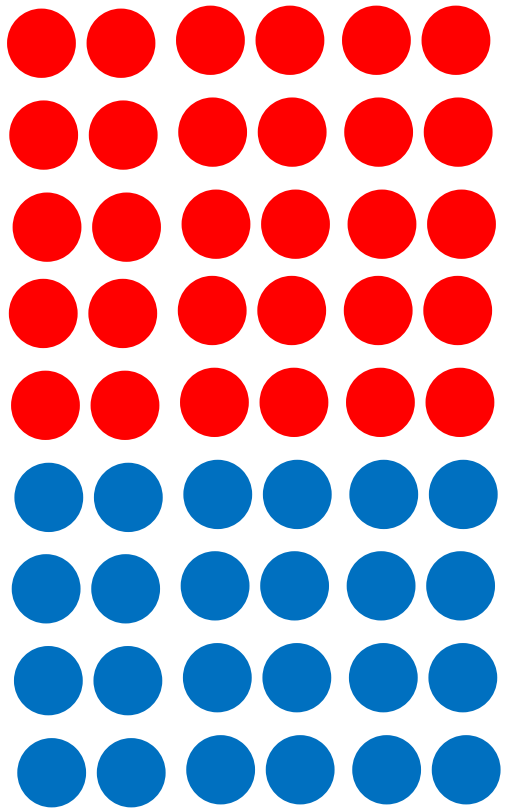
$$= 35 + 21 = 56$$



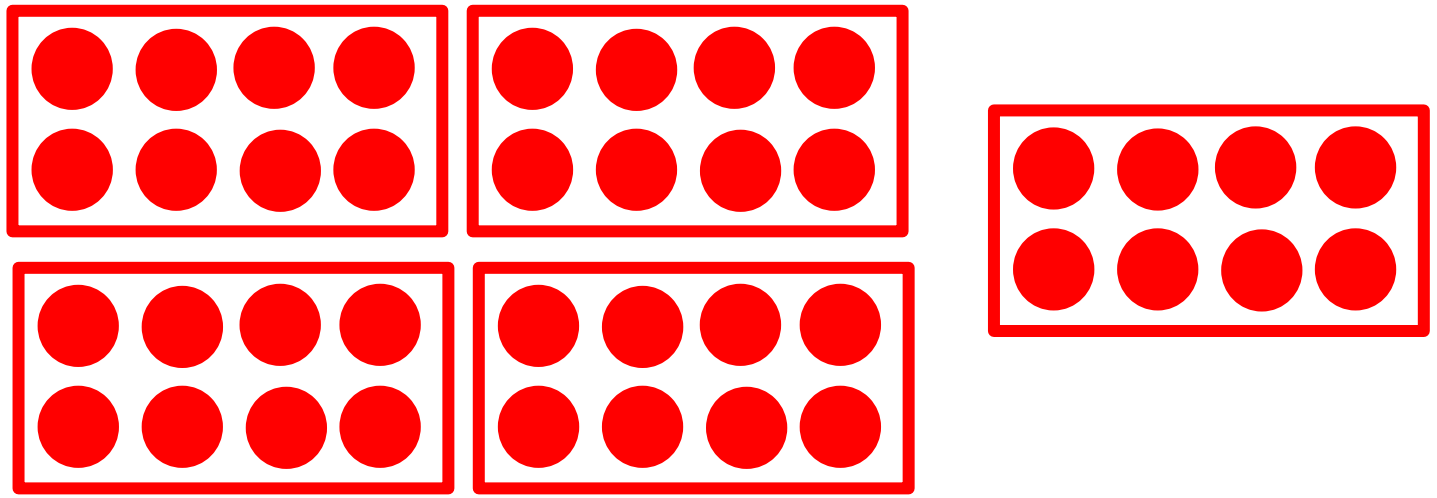
Complete the following equations. Then, draw an array to show the distribution.

$$6 \times 9 = 9 \times 6 = (5 + 4) \times 6 = (5 \times 6) + (4 \times 6)$$

$$= 30 + 24 = 54$$



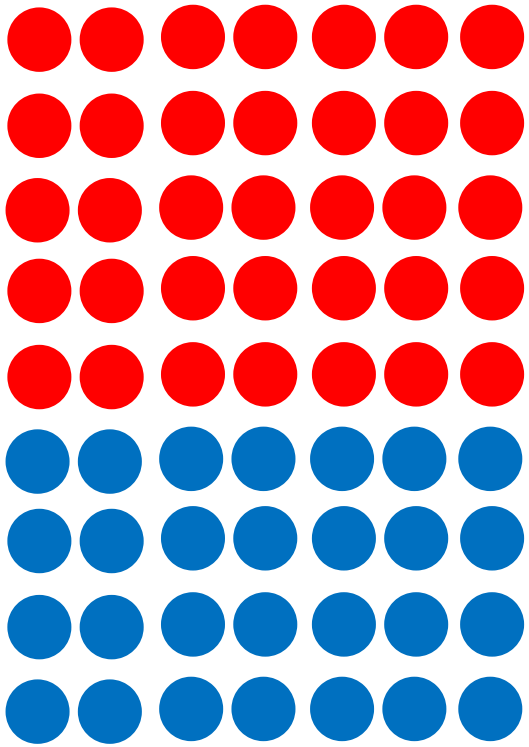
1. Monica has 8 peanuts in each pouch. She has 5 pouches. How many peanuts does she have? Draw equal groups.



$8 \times 5 = 5 \times 8 = 4 \times 8 + 8 =$

40 peanuts

2. Abby has 9 envelopes with 7 files each inside. How man files does Abby have? Draw an array model.



$7 \times 9 = 9 \times 7 = (5 + 4) \times 7 = (5 \times 7) + (4 \times 7) = 35 + 28 =$

63 files