

# MULTIPLICATION

## FACT FLUENCY

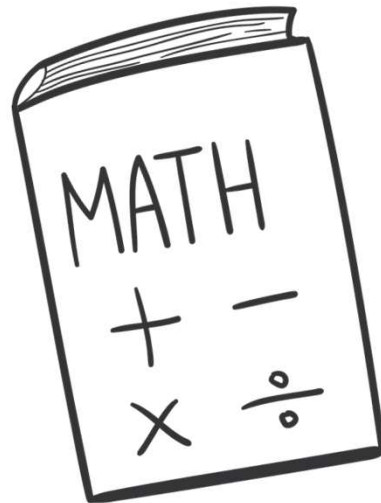
EXPLORE THE 11s TIMES TABLE

# LESSON 12

# TODAY'S OBJECTIVE

Today we will explore the distributive property as a strategy to solve the 11s times table.

# TAKE OUT YOUR **MATH JOURNALS**

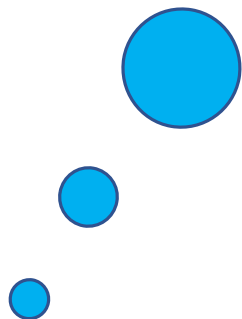




WATCH ME FIRST

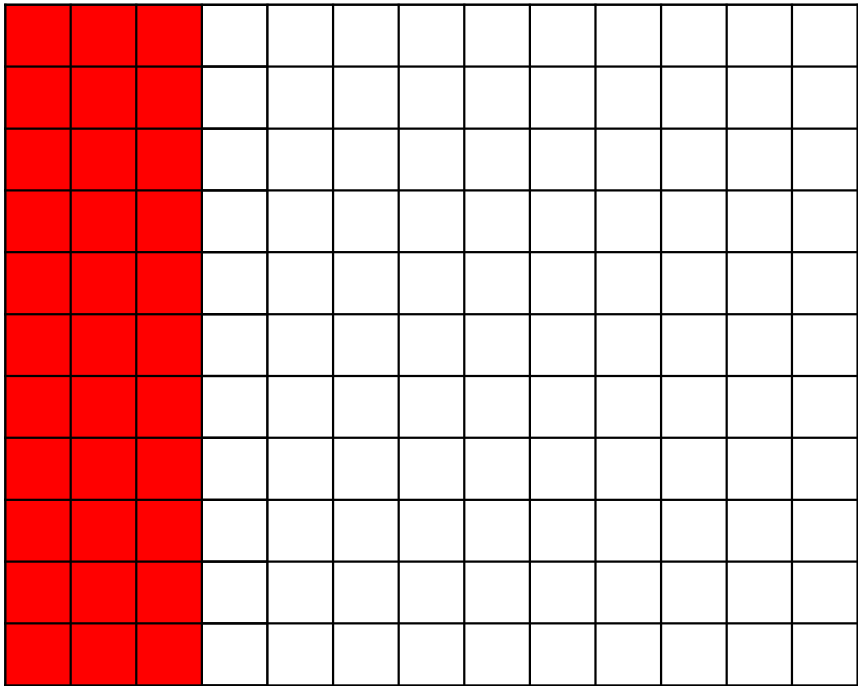


**Today we will use the 10s and 1s facts to find the products of the 11s facts.**



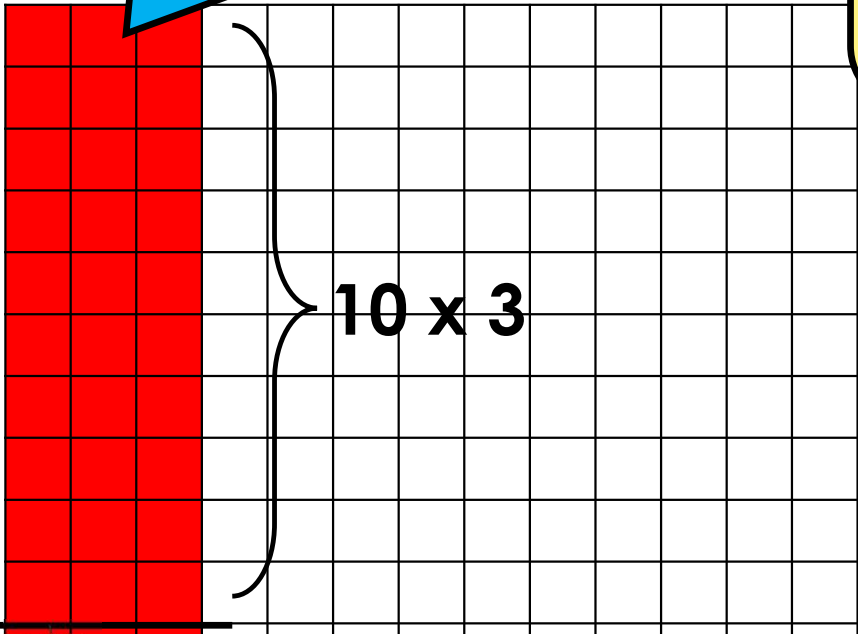
 WATCH ME FIRST

I want to find the product of  $11 \times 3$ .  
I'll start by creating a model.





Here is  $10 \times 3$  or  
10 groups of 3



My model represents  $11 \times 3$ . Inside  $11 \times 3$ , I see  $10 \times 3$  and this is a 10s fact. I'll draw a line to separate the 10s fact. This is called **decomposing**.

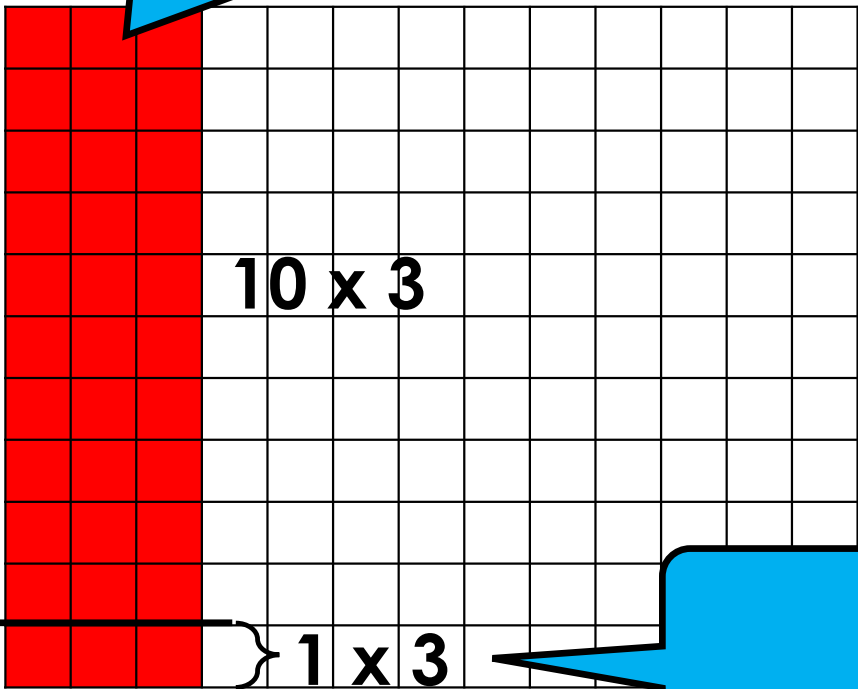


**Decomposing is the act of breaking a quantity into parts.**



I also see one group of 3 inside the model.

Here is  $10 \times 3$  or  
10 groups of 3



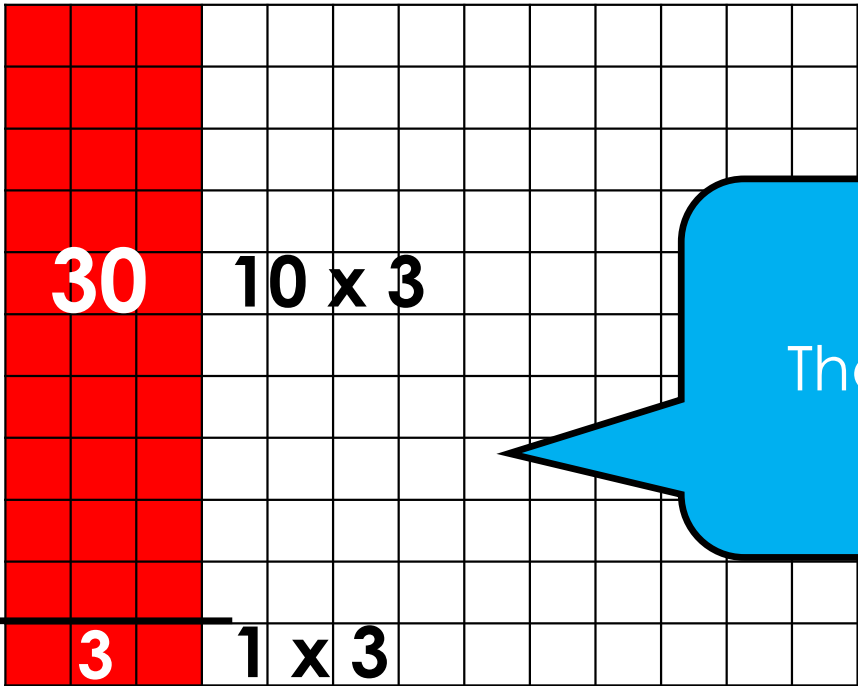
I decomposed  
 $11 \times 3$  and found two  
multiplication facts inside.  
 $10 \times 3$  and  $1 \times 3$

Here is  $1 \times 3$  or  
1 group of 3





Next, I'll add both products to solve.



$30 + 3 = 33$   
The total is 33, so...  
 $11 \times 3 = 33$

11s Facts	
x1	
x2	
x3	<b>11 x 3 = 33</b>
x4	
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	



LET'S WORK TOGETHER



# Let's Review!

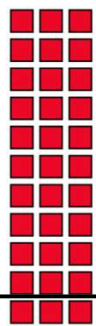
We can solve the 11s facts by using the related 10s and 1s facts:

- 1<sup>st</sup> – Decompose the 11s fact into the related 10s and 1s facts.
- 2<sup>nd</sup> – Find the product of both facts.
- 3<sup>rd</sup> – Solve the 11s fact by adding both products.

**EXAMPLE:** Find the product of **11 x 3**.

**STEP 1**

$$11 \times 3 = ?$$



$$10 \times 3$$

$$1 \times 3$$

**STEP 2**

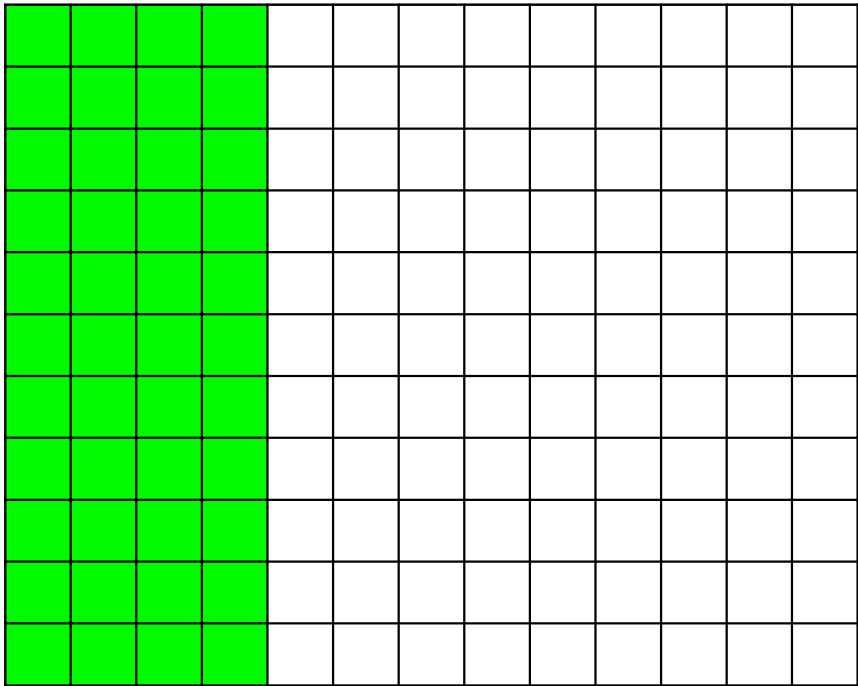
$$11 \times 3 = (10 \times 3) + (1 \times 3)$$
$$\qquad \qquad \qquad \mathbf{30} \qquad \qquad \mathbf{3}$$

**STEP 3**

$$11 \times 3 = (10 \times 3) + (1 \times 3)$$
$$\qquad \qquad \qquad 30 \quad + \quad 3$$
$$11 \times 3 = \mathbf{33}$$

 **Problem #1**  
LET'S WORK TOGETHER

Find the product of  $11 \times 4$ .  
Draw a model in your math journal.

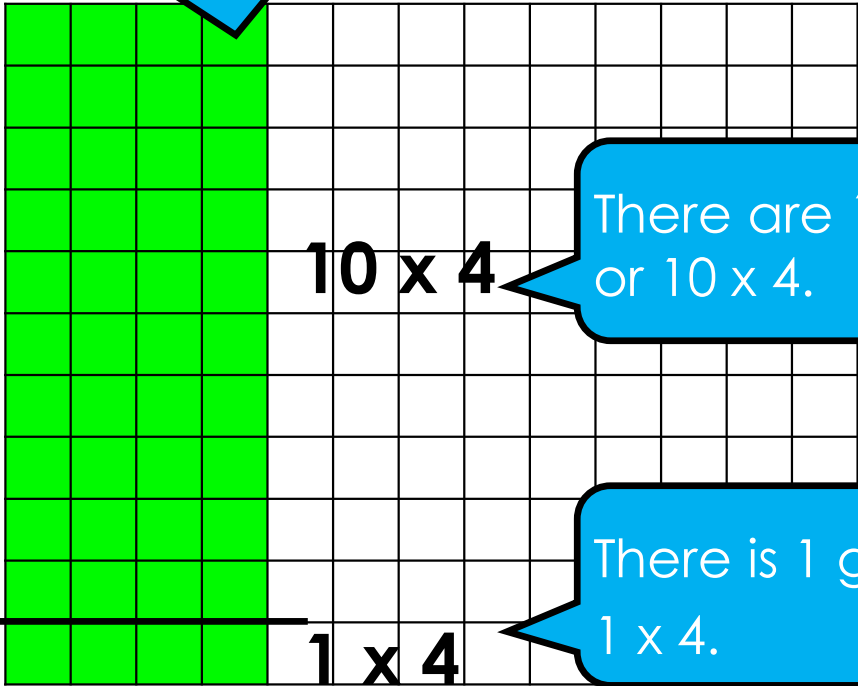


	11s Facts
x1	
x2	
x3	$11 \times 3 = 33$
x4	
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

 **Problem #1**  
LET'S WORK TOGETHER

What do we need to do first?  
Record in your math journal.

**STEP 1**  
We need to decompose to find the related 10s and 1s facts.



There are 10 groups of 4 or  $10 \times 4$ .

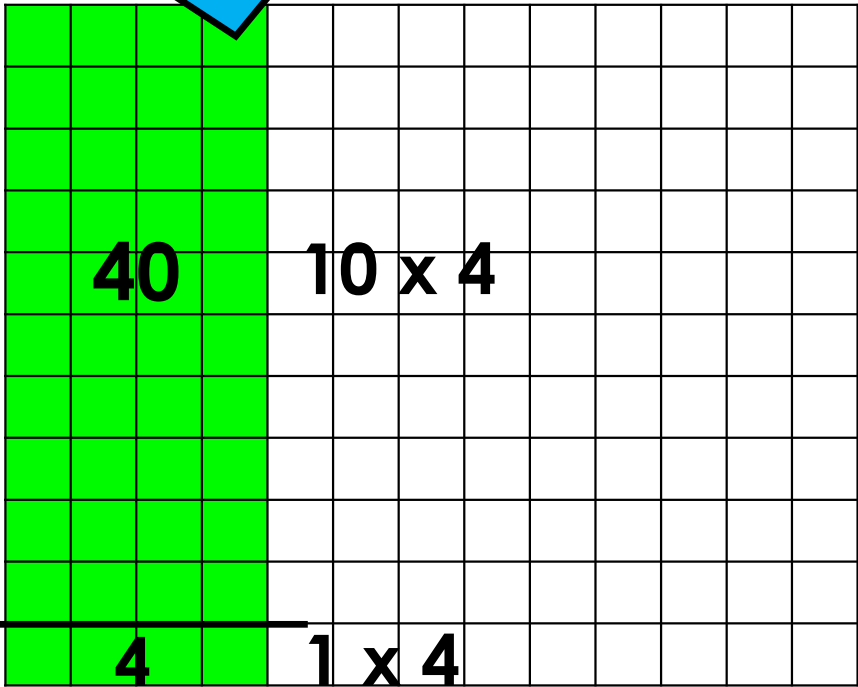
There is 1 group of 4 or  $1 \times 4$ .

	11s Facts
x1	
x2	
x3	$11 \times 3 = 33$
x4	
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

 **Problem #1**  
LET'S WORK TOGETHER

What should we do next?  
Record in your math journal.

**STEP 1**  
We need to decompose to find the related 10s and 1s facts.



**STEP 2**

Find both products.

$$11 \times 4 = (10 \times 4) + (1 \times 4)$$

**40                      4**

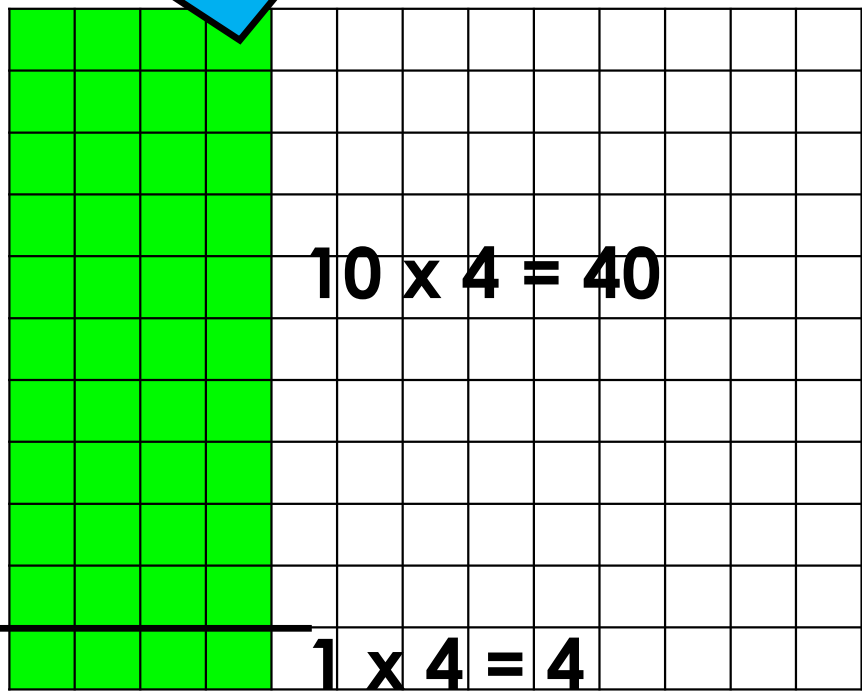
11s Facts	
x1	
x2	
x3	11 x 3 = 33
x4	
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

 **Problem #1**  
LET'S WORK TOGETHER

What should we do last?  
Record in your math journal.

**STEP 1**

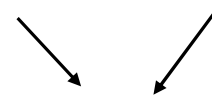
We need to decompose to find the related 10s and 1s facts.



**STEP 2**

$$11 \times 4 = (10 \times 4) + (1 \times 4)$$

$$40 + 4$$



**STEP 3** **11 x 4 = 44**

Add the products together to find 11 x 4.

11s Facts	
x1	
x2	
x3	11 x 3 = 33
x4	<b>11 x 4 = 44</b>
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

Did you know, when we decompose a multiplication fact into 2 separate facts and combine the products, we are using the **distributive property**?



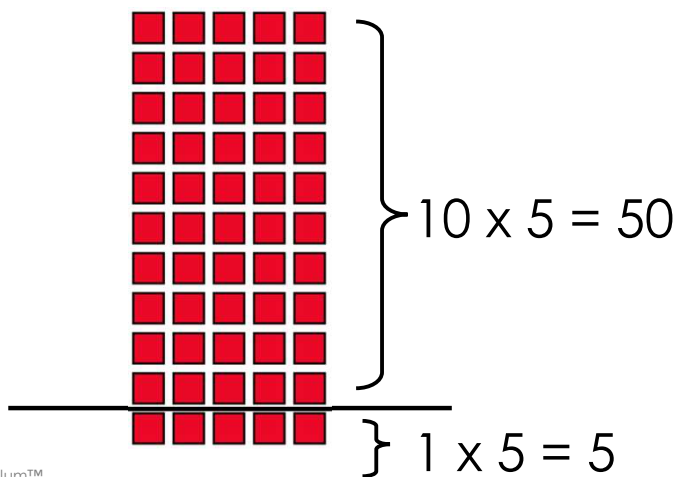




# Vocabulary Highlight

The **distributive property** states, that multiplying a sum by a given number is the same as multiplying each addend by the number and then adding the products.

**EXAMPLE: SOLVE  $11 \times 5$**



$$11 \times 5 = (10 \times 5) + (1 \times 5)$$

$$50 + 5 = 55$$

$11 \times 5 = 55$

It's important to remember that **we can use different strategies to solve problems.**



 **Problem #1**  
LET'S WORK TOGETHER

Based on previous lessons, what other strategy can we use to find the product of **11 x 4**? Explain your answer.

We could also use the related 2s fact and then double the product. This is the strategy we learned to find the 4s facts.

**STEP 1**

**11 x 2** is related to **11 x 4**  
 $11 \times 2 = 22$

**STEP 2**

Double 22.  
 $22 + 22 = 44$

**STEP 3**

$11 \times 4 = 44$

11s Facts	
x1	
x2	
x3	$11 \times 3 = 33$
x4	$11 \times 4 = 44$
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

**Let's think of other strategies we learned in previous lessons, to solve  $11 \times 1$  and  $11 \times 2$ .**



 **Problem #1**  
LET'S WORK TOGETHER

Based on previous lessons, what strategy can we use to find the product of **11 x 1**? Explain.

We can use the **identity property** of multiplication to solve. Any number multiplied by 1 equals that number. So...  $11 \times 1 = 11$  and  $1 \times 11 = 11$ .

	11s Facts
x1	<b>11 x 1 = 11</b>
x2	
x3	11 x 3 = 33
x4	11 x 4 = 44
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

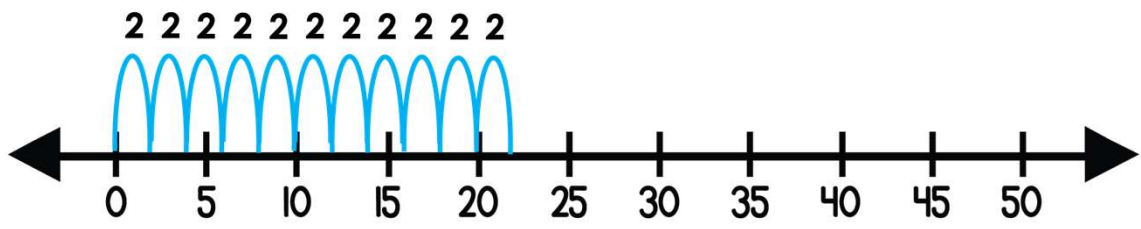
 **Problem #1**  
LET'S WORK TOGETHER

Based on previous lessons, what strategy can we use to find the product of **11 x 2**? Explain.

We can use the doubling strategy we learned to find the 2s facts.

**11 + 11 = 22 then, 11 x 2 = 22 and, 2 x 11 = 22**

We can also skip count by 2s.



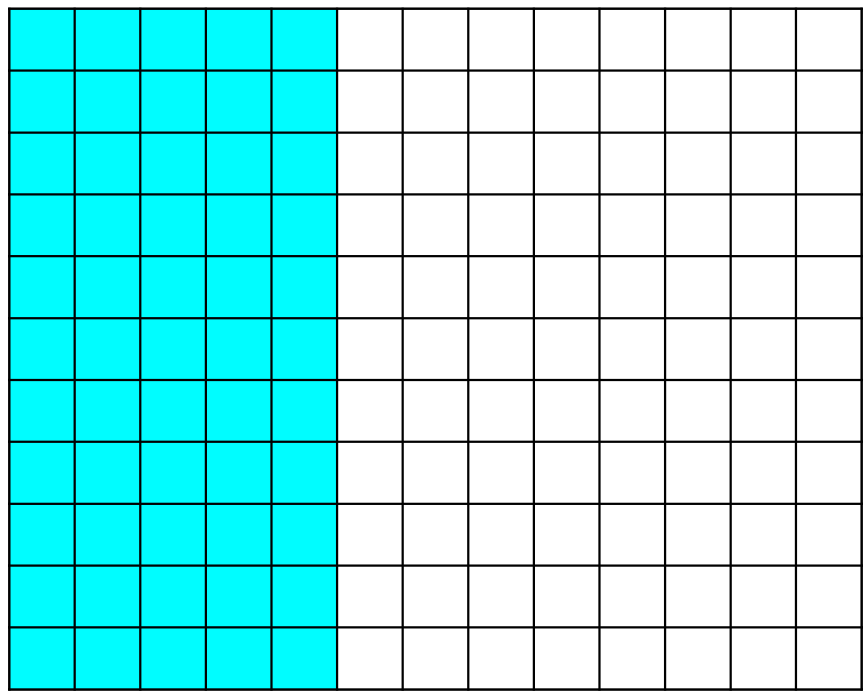
	11s Facts
x1	11 x 1 = 11
x2	<b>11 x 2 = 22</b>
x3	11 x 3 = 33
x4	11 x 4 = 44
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

**LET'S DO ONE MORE TOGETHER...**



 **Problem #2**  
LET'S WORK TOGETHER

Find the product of  $11 \times 5$  using the **distributive property**.  
Draw a model in your math journal.



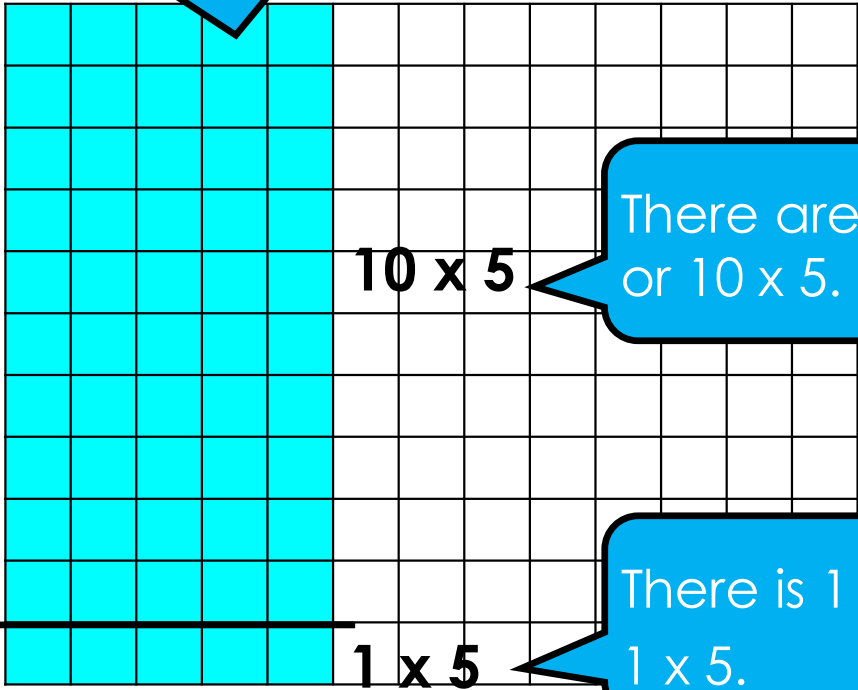
	11s Facts
x1	$11 \times 1 = 11$
x2	$11 \times 2 = 22$
x3	$11 \times 3 = 33$
x4	$11 \times 4 = 44$
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	



 **Problem #2**  
LET'S WORK TOGETHER

What do we need to do first?  
Record in your math journal.

**STEP 1**  
We need to decompose to find the related 10s and 1s facts.



There are 10 groups of 5 or  $10 \times 5$ .

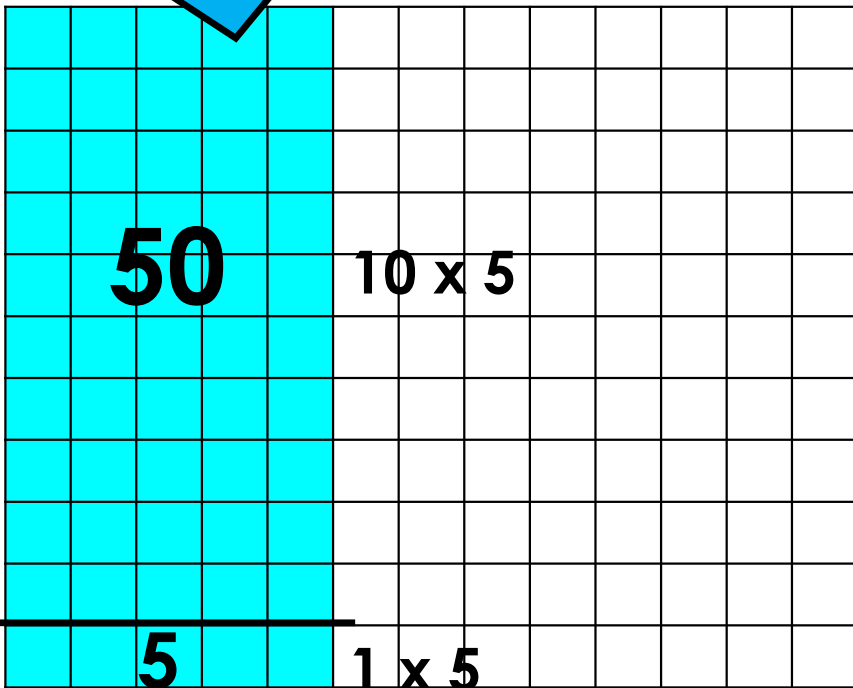
There is 1 group of 5 or  $1 \times 5$ .

	11s Facts
x1	$11 \times 1 = 11$
x2	$11 \times 2 = 22$
x3	$11 \times 3 = 33$
x4	$11 \times 4 = 44$
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

 **Problem #2**  
LET'S WORK TOGETHER

**STEP 1**

We need to decompose to find the related 10s and 1s facts.



What should we do next?  
Record in your math journal.

**STEP 2** Find both products.

$$11 \times 5 = (10 \times 5) + (1 \times 5)$$

**50**

**5**

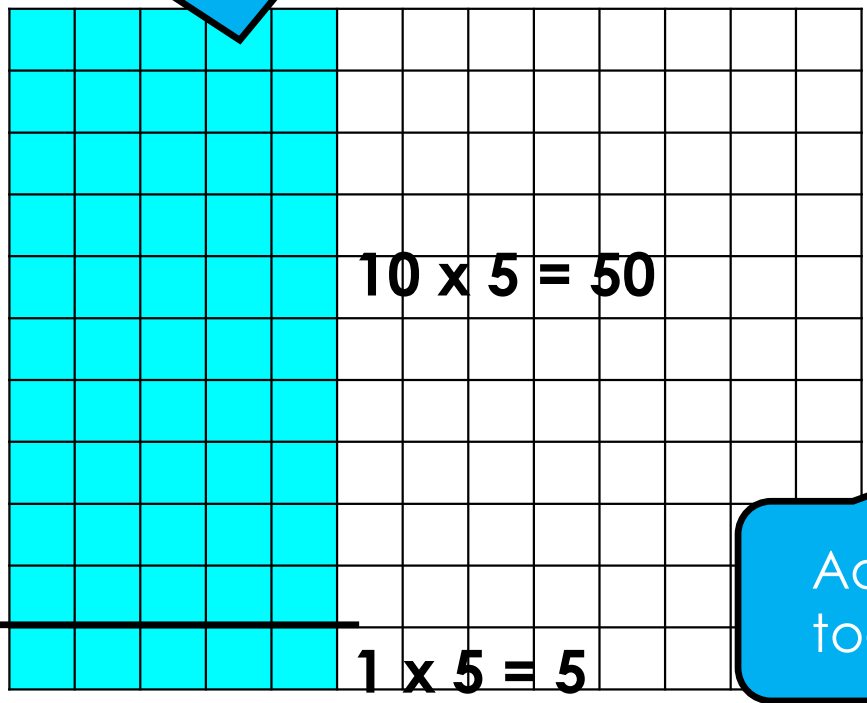
11s Facts	
x1	11 x 1 = 11
x2	11 x 2 = 22
x3	11 x 3 = 33
x4	11 x 4 = 44
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

 **Problem #2**  
LET'S WORK TOGETHER

What should we do last?  
Record in your math journal.

**STEP 1**

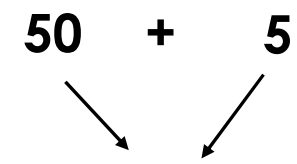
We need to decompose to find the related 10s and 1s facts.



**STEP 2**

Find both products.

$$11 \times 5 = (10 \times 5) + (1 \times 5)$$



**STEP 3**

$11 \times 5 = 55$

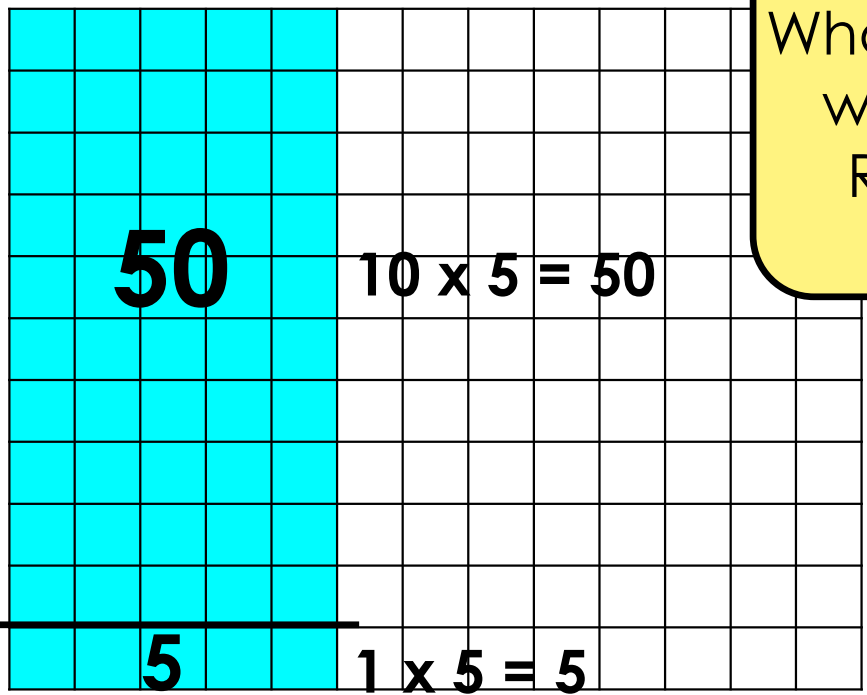
Add the products together to find  $11 \times 5$ .

**11s Facts**

x1	$11 \times 1 = 11$
x2	$11 \times 2 = 22$
x3	$11 \times 3 = 33$
x4	$11 \times 4 = 44$
x5	<b><math>11 \times 5 = 55</math></b>
x6	
x7	
x8	
x9	
x10	
x11	
x12	

 **Problem #2**  
LET'S WORK TOGETHER

# $11 \times 5 = 55$



What patterns do you notice when multiplying by 11s? Record in your journals.

11s Facts	
x1	11 x 1 = 11
x2	11 x 2 = 22
x3	11 x 3 = 33
x4	11 x 4 = 44
x5	<b>11 x 5 = 55</b>
x6	
x7	
x8	
x9	
x10	
x11	
x12	

# CHECK - IN

- What did you notice?
- Can you make a connection to anything else you already know? How?
- Do you have any questions?



IT'S YOUR TURN

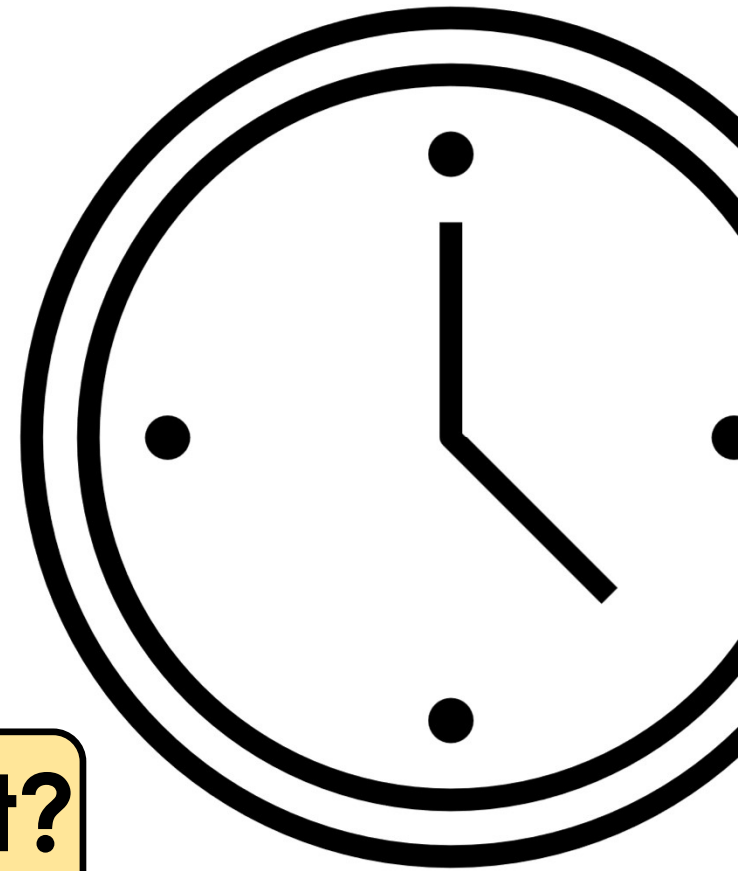


Now It's **“YOUR TURN”** to Solve



**Don't forget to show your work!**

# Time to **Discuss** and **Check** Your Answers



**How did you solve it?**





## Problem #1

YOUR TURN

Use the distributive property to find the product of  $11 \times 6$ . Fill in the chart.





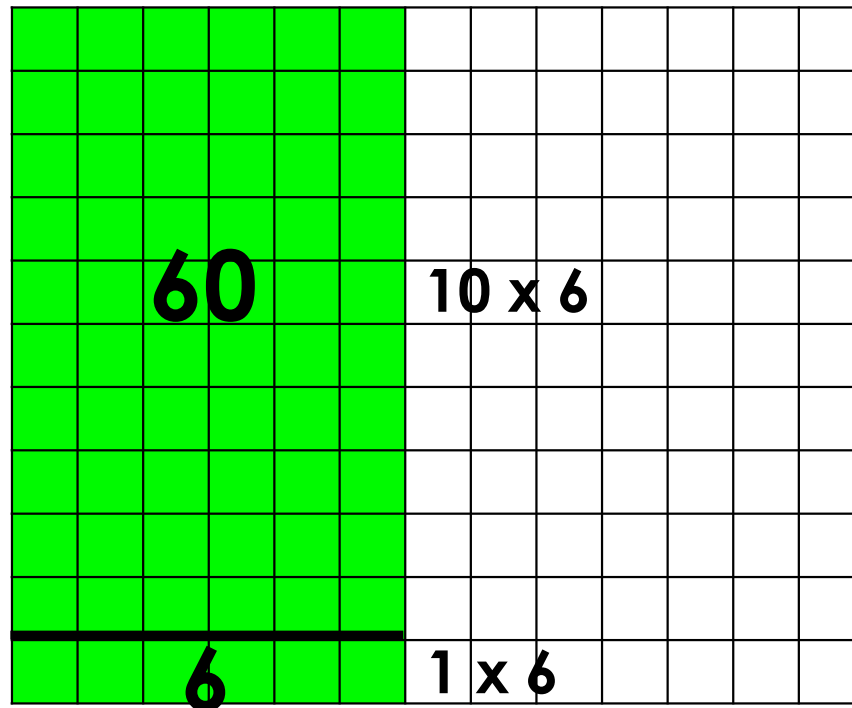
# Problem #1

YOUR TURN

Use the distributive property to find the product of  $11 \times 6$ . Fill in the chart.

	11s Facts
x1	$11 \times 1 = 11$
x2	$11 \times 2 = 22$
x3	$11 \times 3 = 33$
x4	$11 \times 4 = 44$
x5	$11 \times 5 = 55$
x6	<b><math>11 \times 6 = 66</math></b>
x7	
x8	
x9	
x10	
x11	
x12	

**DRAW**



**RECORD & SOLVE**

$$11 \times 6 = (10 \times 6) + (1 \times 6)$$
$$60 + 6$$

Two arrows point from the '60' and '6' in the equation above to the '66' in the final equation below.

$$11 \times 6 = 66$$



## Problem #2

YOUR TURN

Use the distributive property to find the product of  $11 \times 7$ . Fill in the chart.





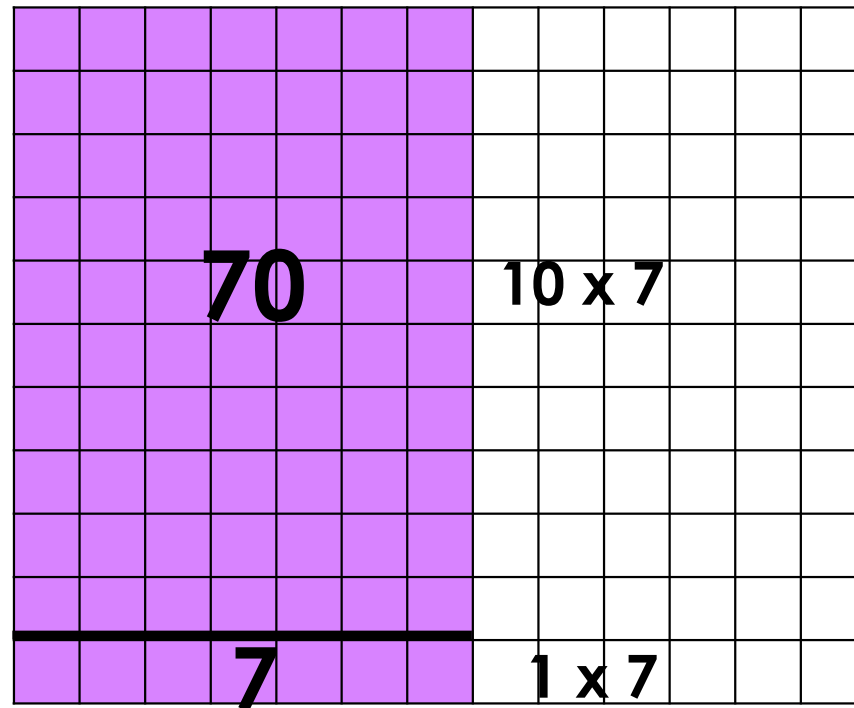
## Problem #2

YOUR TURN

Use the distributive property to find the product of  $11 \times 7$ . Fill in the chart.

	11s Facts
x1	$11 \times 1 = 11$
x2	$11 \times 2 = 22$
x3	$11 \times 3 = 33$
x4	$11 \times 4 = 44$
x5	$11 \times 5 = 55$
x6	$11 \times 6 = 66$
x7	<b><math>11 \times 7 = 77</math></b>
x8	
x9	
x10	
x11	
x12	

**DRAW**



**RECORD & SOLVE**

$$11 \times 7 = (10 \times 7) + (1 \times 7)$$

$$70 + 7$$

$$11 \times 7 = 77$$



## Problem #3

YOUR TURN

Use the distributive property to find the product of  $11 \times 8$ . Fill in the chart.





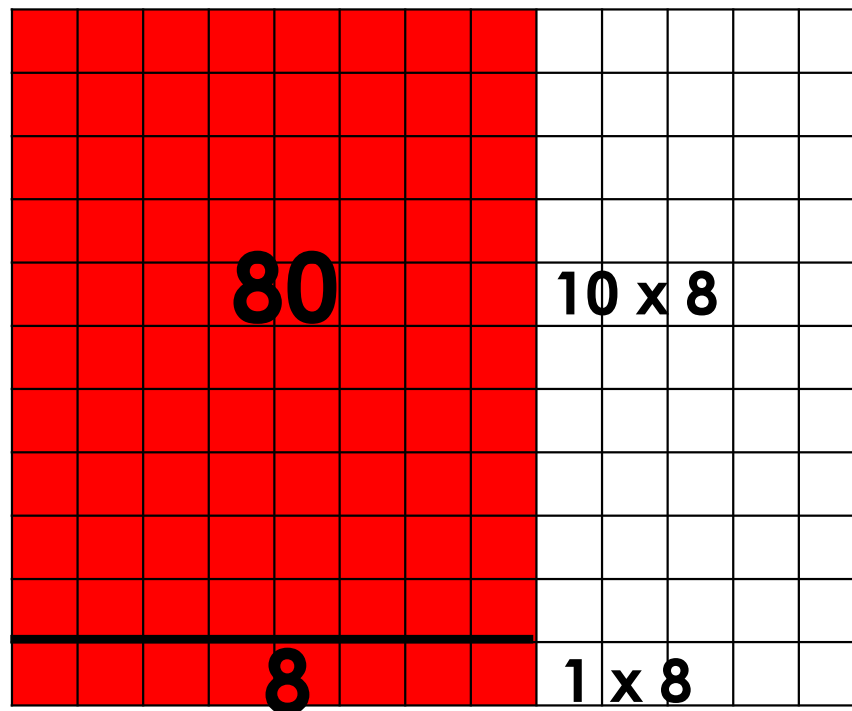
## Problem #3

YOUR TURN

Use the distributive property to find the product of  $11 \times 8$ . Fill in the chart.

	11s Facts
x1	$11 \times 1 = 11$
x2	$11 \times 2 = 22$
x3	$11 \times 3 = 33$
x4	$11 \times 4 = 44$
x5	$11 \times 5 = 55$
x6	$11 \times 6 = 66$
x7	$11 \times 7 = 77$
x8	<b><math>11 \times 8 = 88</math></b>
x9	
x10	
x11	
x12	

**DRAW**



**RECORD & SOLVE**

$$11 \times 8 = (10 \times 8) + (1 \times 8)$$

$$80 + 8$$

$$11 \times 8 = 88$$



## Problem #4

YOUR TURN

Use the distributive property to find the product of  $11 \times 9$ . Fill in the chart.





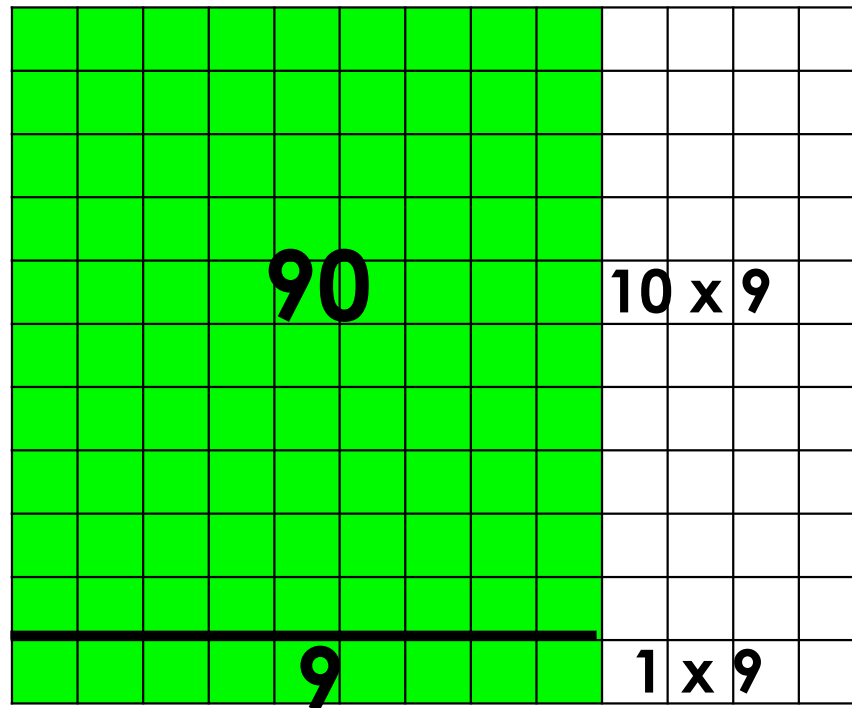
## Problem #4

YOUR TURN

Use the distributive property to find the product of  $11 \times 9$ . Fill in the chart.

	11s Facts
x1	$11 \times 1 = 11$
x2	$11 \times 2 = 22$
x3	$11 \times 3 = 33$
x4	$11 \times 4 = 44$
x5	$11 \times 5 = 55$
x6	$11 \times 6 = 66$
x7	$11 \times 7 = 77$
x8	$11 \times 8 = 88$
x9	<b><math>11 \times 9 = 99</math></b>
x10	
x11	
x12	

**DRAW**



**RECORD & SOLVE**

$$11 \times 9 = (10 \times 9) + (1 \times 9)$$

$$90 + 9$$

$$11 \times 9 = 99$$





## Problem #5

YOUR TURN

Use the distributive property to find the product of  $11 \times 10$ . Fill in the chart.





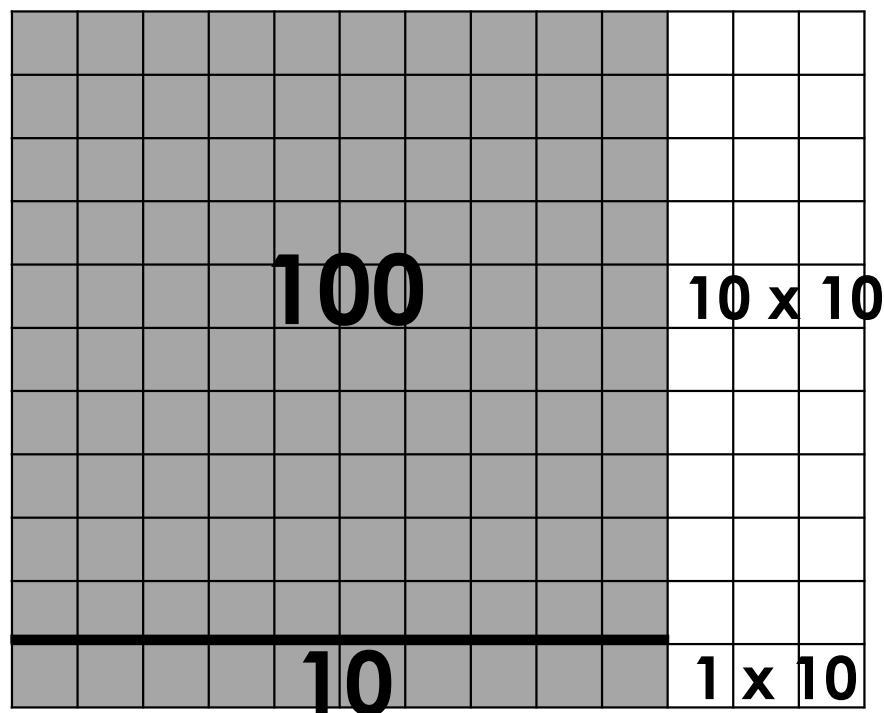
## Problem #5

YOUR TURN

Use the distributive property to find the product of  $11 \times 10$ . Fill in the chart.

	11s Facts
x1	$11 \times 1 = 11$
x2	$11 \times 2 = 22$
x3	$11 \times 3 = 33$
x4	$11 \times 4 = 44$
x5	$11 \times 5 = 55$
x6	$11 \times 6 = 66$
x7	$11 \times 7 = 77$
x8	$11 \times 8 = 88$
x9	$11 \times 9 = 99$
x10	<b><math>11 \times 10 = 110</math></b>
x11	
x12	

**DRAW**



**RECORD & SOLVE**

$$11 \times 10 = (10 \times 10) + (1 \times 10)$$

$$100 + 10$$

$$11 \times 10 = 110$$



## Problem #6

YOUR TURN

**Use the distributive property to find the product of  $11 \times 11$ . Fill in the chart.**





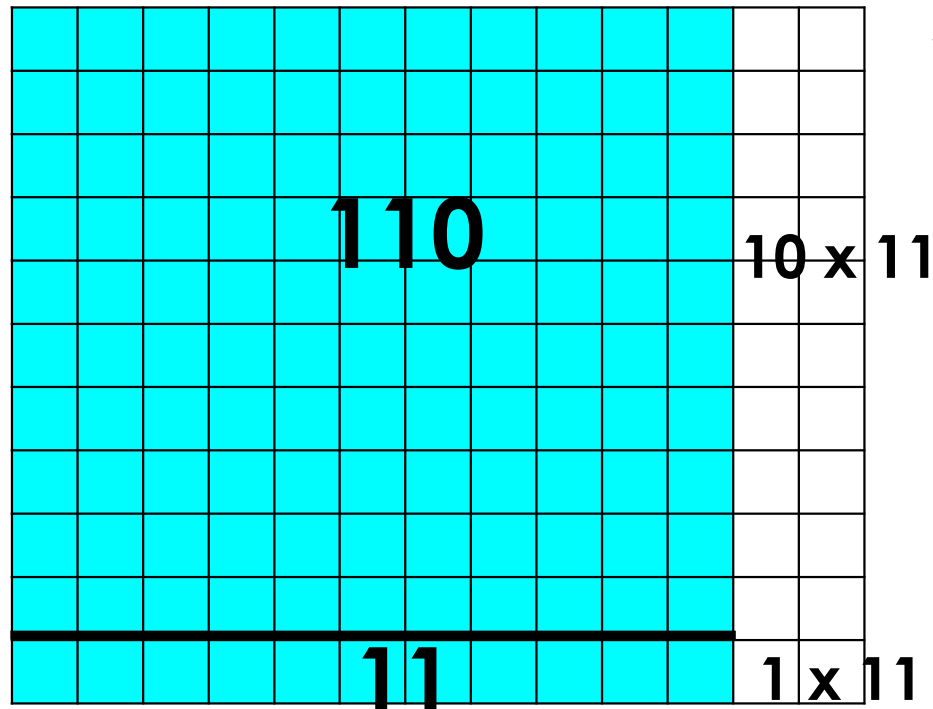
## Problem #6

YOUR TURN

Use the distributive property to find the product of  $11 \times 11$ . Fill in the chart.

	11s Facts
x1	$11 \times 1 = 11$
x2	$11 \times 2 = 22$
x3	$11 \times 3 = 33$
x4	$11 \times 4 = 44$
x5	$11 \times 5 = 55$
x6	$11 \times 6 = 66$
x7	$11 \times 7 = 77$
x8	$11 \times 8 = 88$
x9	$11 \times 9 = 99$
x10	$11 \times 10 = 110$
x11	<b><math>11 \times 11 = 121</math></b>
x12	

**DRAW**



**RECORD & SOLVE**

$$11 \times 11 = (10 \times 11) + (1 \times 11)$$

$$110 + 11$$

$$11 \times 11 = 121$$



## Problem #7

YOUR TURN

Use the distributive property to find the product of  $11 \times 12$ . Fill in the chart.





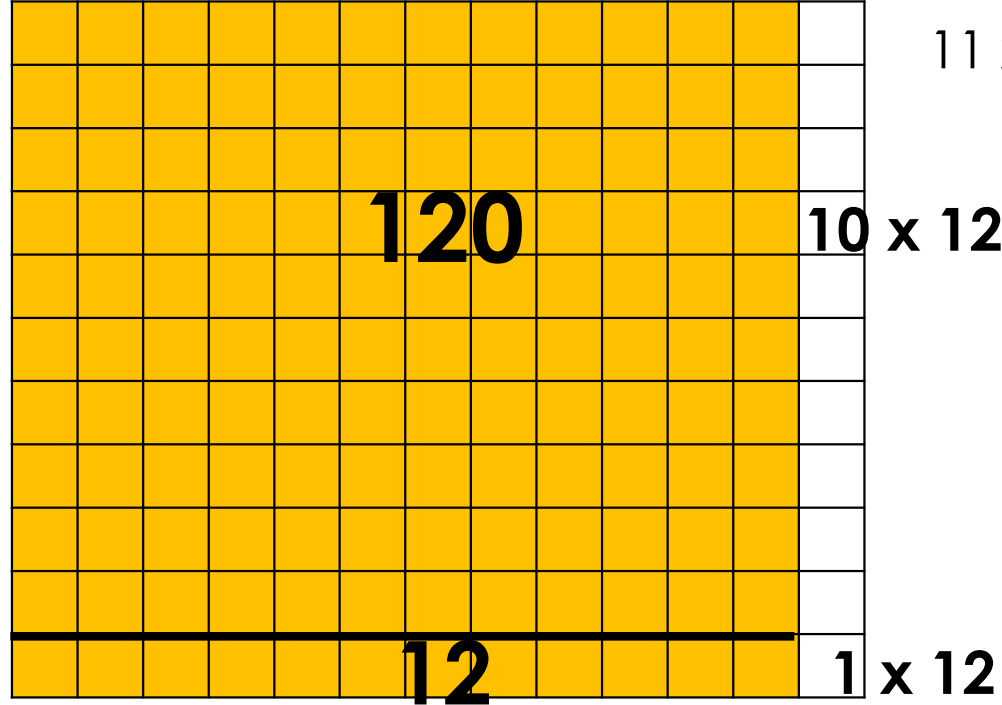
## Problem #7

YOUR TURN

Use the distributive property to find the product of  $11 \times 12$ . Fill in the chart.

	11s Facts
x1	$11 \times 1 = 11$
x2	$11 \times 2 = 22$
x3	$11 \times 3 = 33$
x4	$11 \times 4 = 44$
x5	$11 \times 5 = 55$
x6	$11 \times 6 = 66$
x7	$11 \times 7 = 77$
x8	$11 \times 8 = 88$
x9	$11 \times 9 = 99$
x10	$11 \times 10 = 110$
x11	$11 \times 11 = 121$
x12	<b><math>11 \times 12 = 132</math></b>

**DRAW**



**RECORD & SOLVE**

$$11 \times 12 = (10 \times 12) + (1 \times 12)$$

$$120 + 12$$

$$11 \times 12 = 132$$



## Problem #8

YOUR TURN

**Explain the strategy we used to find the products of the 11s times table facts.**





## Problem #8

YOUR TURN

**Explain the strategy we used to find the products of the 11s times table facts.**

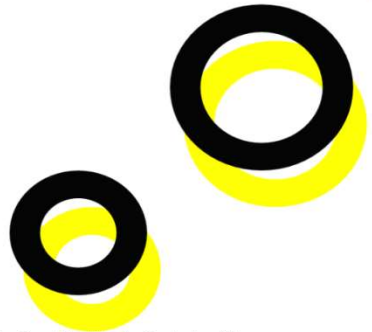
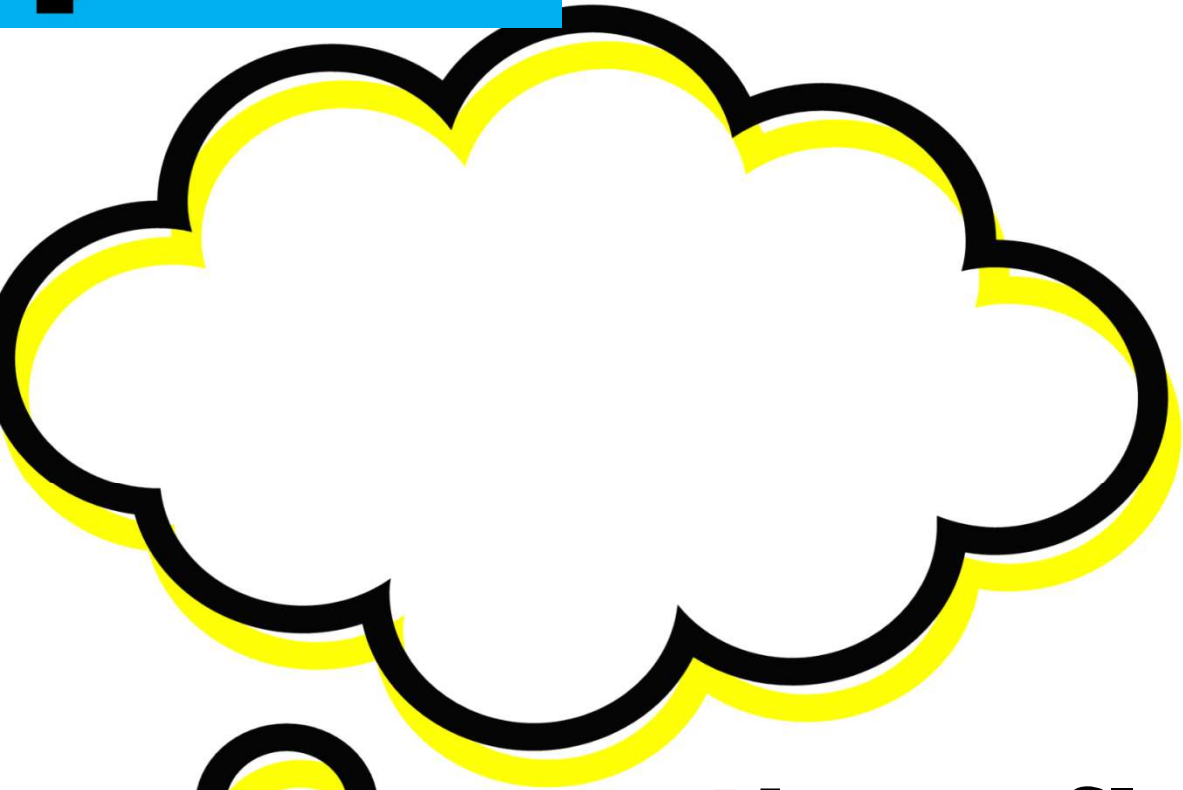
### **Answers May Vary**

We can use the distributive property to solve. We can add the products of the related 10s and 1s facts. By adding these together, we will get the product of the 11s facts.





 **Let's Reflect**



**It's reflection time!**