

MULTIPLICATION

FACT FLUENCY

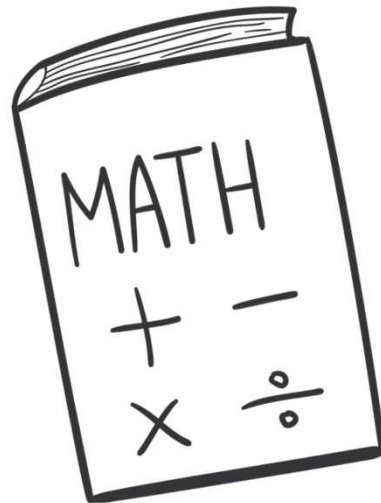
EXPLORE THE 12s TIMES TABLE

LESSON 13

TODAY'S OBJECTIVE

Today we will explore the distributive property as a strategy to solve the 12s times table.

TAKE OUT YOUR **MATH JOURNALS**





WATCH ME FIRST



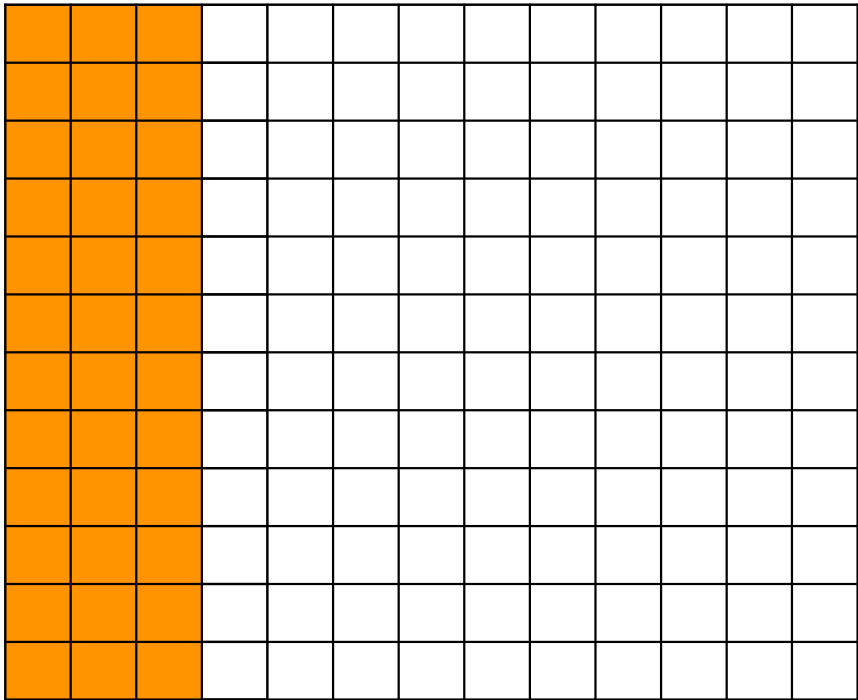
WATCH ME FIRST

Today we will use the 10s and 2s facts to find the products of the 12s facts.





I want to find the product of **12 x 3**.
I'll start by creating a model.





Here is 10×3 or
10 groups of 3



A grid representing a multiplication problem. The grid is 12 units wide and 3 units high. The first 10 units of width are shaded orange, and the last 2 units are white. A bracket on the left side of the orange area spans 10 rows and is labeled "10 x 3".

10×3

My model represents 12×3 . Inside 12×3 , I see 10×3 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.

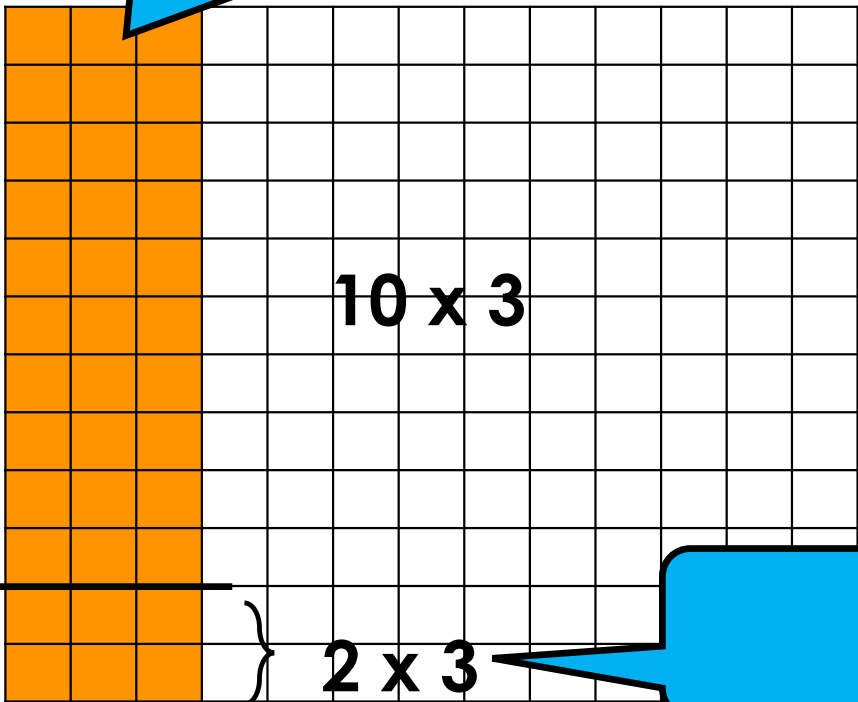


Did You Know?



I also see 2 groups of 3 inside the area model.

Here is 10×3 or 10 groups of 3

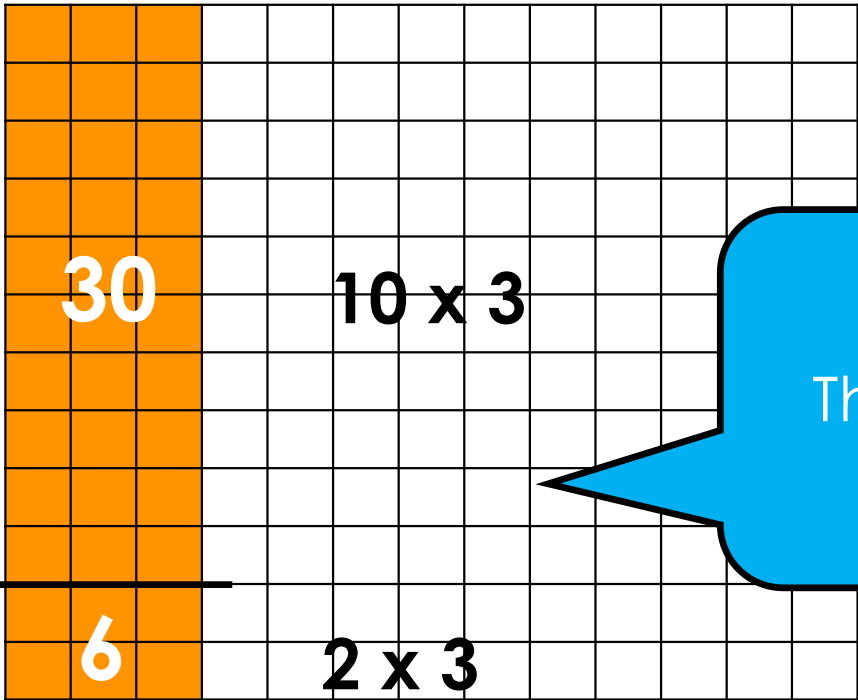


I decomposed 12×3 and found two multiplication facts inside. 10×3 and 2×3

Here is 2×3 or 2 groups of 3



Next, I'll add both products to solve.



$30 + 6 = 36$
The total area is 36.
So... $12 \times 3 = 36$

12s Facts	
x1	
x2	
x3	12 x 3 = 36
x4	
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	



LET'S WORK TOGETHER



Let's Review!

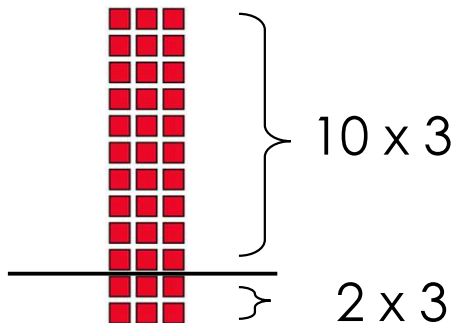
We can solve the 12s facts by using the related 10s and 2s facts:

- 1st – Decompose the 12s fact into the related 10s and 2s facts.
- 2nd – Find the product of both facts.
- 3rd – Solve the 12s fact by adding both products.

EXAMPLE: Find the product of **12 x 3**.

STEP 1

$$12 \times 3 = ?$$



STEP 2

$$12 \times 3 = (10 \times 3) + (2 \times 3)$$

30 **6**

STEP 3

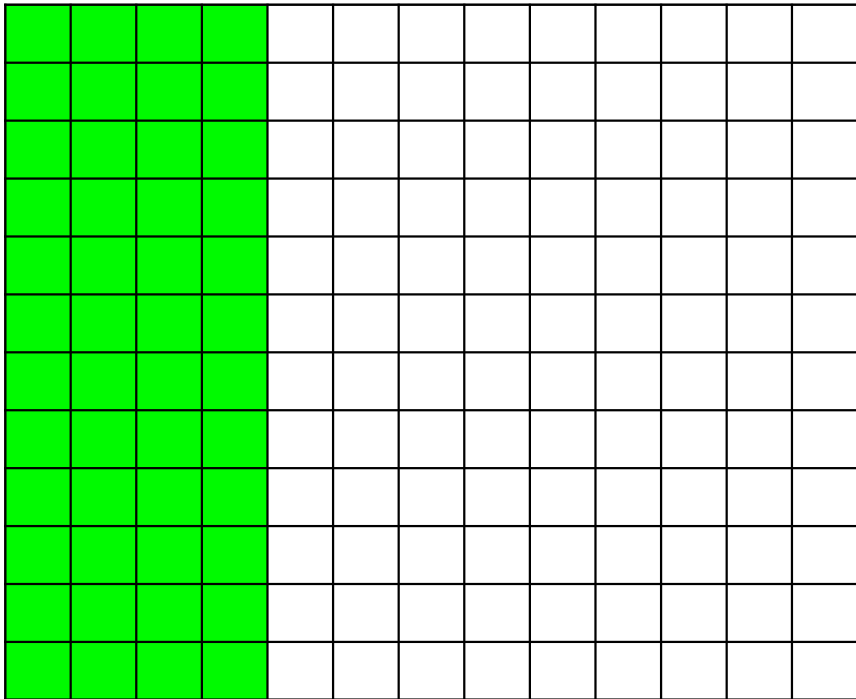
$$12 \times 3 = (10 \times 3) + (2 \times 3)$$

30 + 6

$$12 \times 3 = \mathbf{36}$$

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

Find the product of 12×4 .
Draw an area model in your math journal.

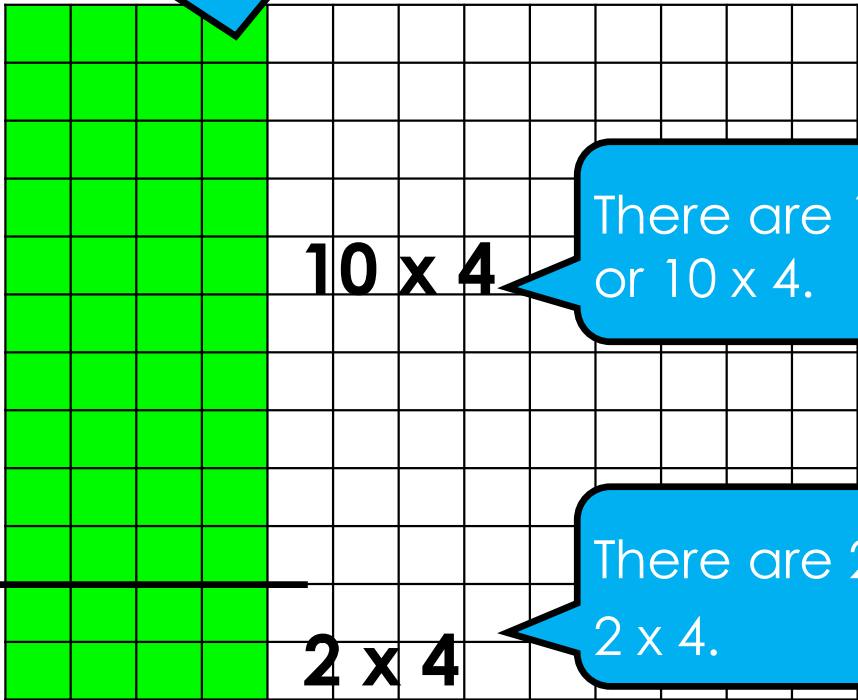


	12s Facts
x1	
x2	
x3	$12 \times 3 = 36$
x4	
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

 **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 2s facts.



There are 10 groups of 4 or 10×4 .

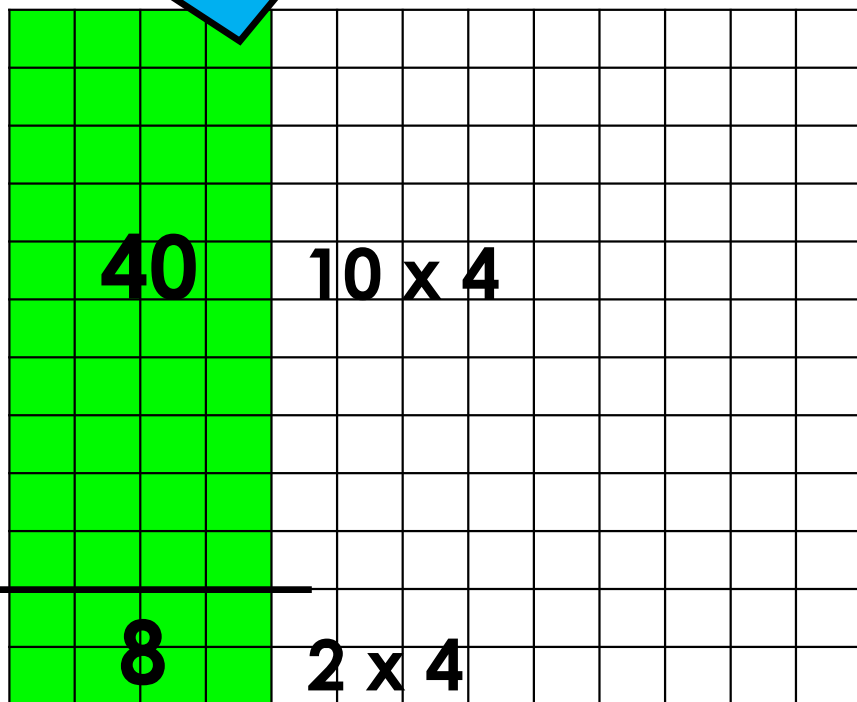
There are 2 groups of 4 or 2×4 .

	12s Facts
x1	
x2	
x3	$12 \times 3 = 36$
x4	
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

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

STEP 1

We need to decompose to find the related 10s and 2s facts.



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

STEP 2

Find both products.

$$12 \times 4 = (10 \times 4) + (2 \times 4)$$

40

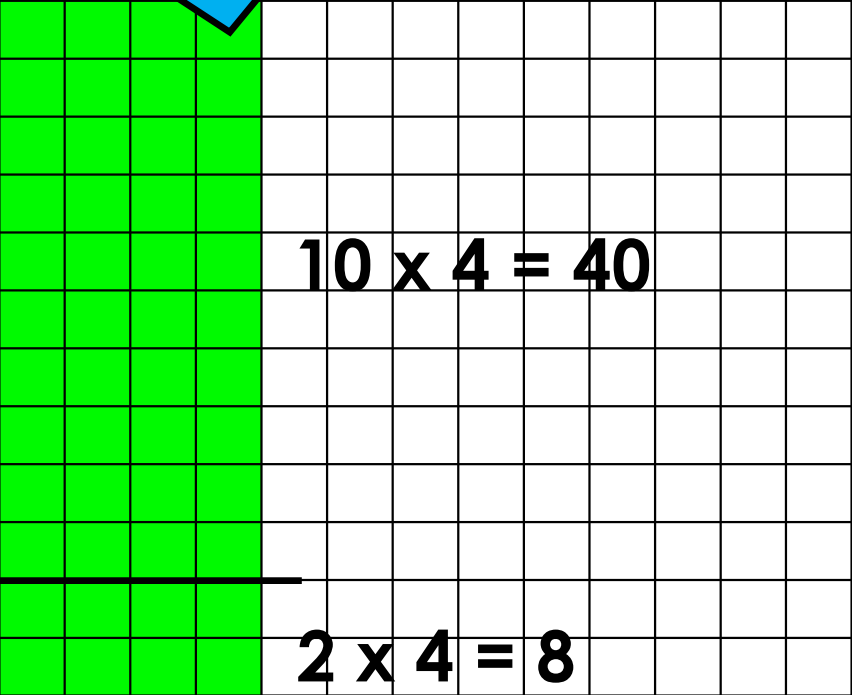
8

	12s Facts
x1	
x2	
x3	$12 \times 3 = 36$
x4	
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

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

STEP 1

We need to decompose to find the related 10s and 2s facts.



$10 \times 4 = 40$

$2 \times 4 = 8$

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

STEP 2

$12 \times 4 = (10 \times 4) + (2 \times 4)$

$40 + 8$

STEP 3 $12 \times 4 = 48$

Add the products together to find 12×4 .

12s Facts

	12s Facts
x1	
x2	
x3	$12 \times 3 = 36$
x4	$12 \times 4 = 48$
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**?

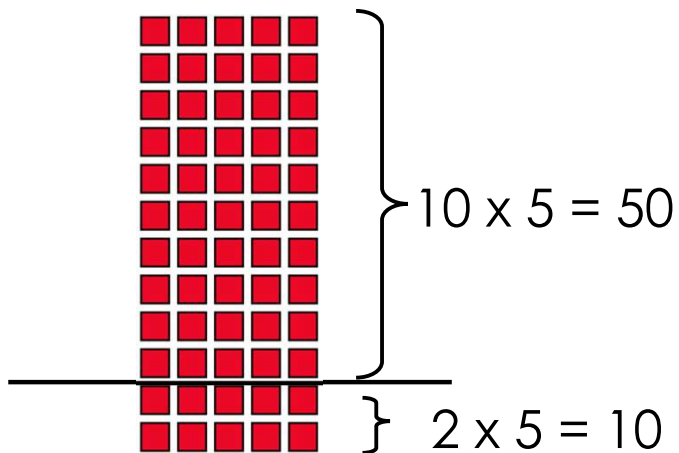




Vocabulary Highlight

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 12×5



$$12 \times 5 = (10 \times 5) + (2 \times 5)$$

$$50 + 10$$
$$12 \times 5 = 60$$

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 **12 x 4**? Explain your answer.

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

STEP 1

12 x 2 is related to **12 x 4**
 $12 \times 2 = 24$

STEP 2

Double 24.
 $24 + 24 = 48$

STEP 3

$12 \times 4 = 48$

12s Facts

x1	
x2	
x3	$12 \times 3 = 36$
x4	$12 \times 4 = 48$
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

Let's think of other strategies we learned in previous lessons, to solve 12×1 and 12×2 .



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

Based on previous lessons, what strategy can we use to find the product of **12 x 1**? Explain.

We can use the **identity property** of multiplication to solve. Any number multiplied by 1 equals that number. So... $12 \times 1 = 12$ and $1 \times 12 = 12$.

	12s Facts
x1	12 x 1 = 12
x2	
x3	12 x 3 = 36
x4	12 x 4 = 48
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

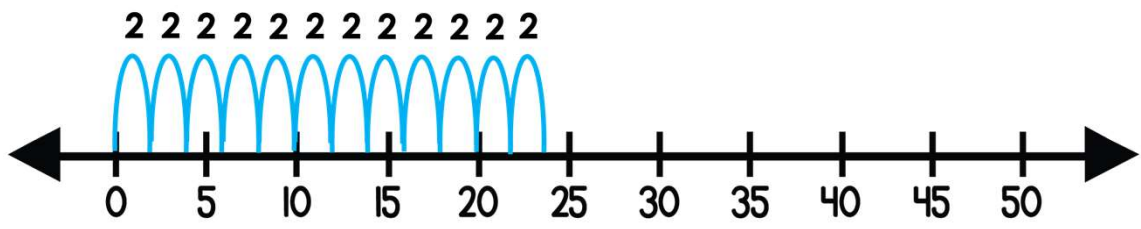
 **Problem #1**
LET'S WORK TOGETHER

Based on previous lessons, what strategy can we use to find the product of **12 x 2**? Explain.

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

12 + 12 = 24 then, 12 x 2 = 24 and, 2 x 12 = 24

We can also skip count by 2s.



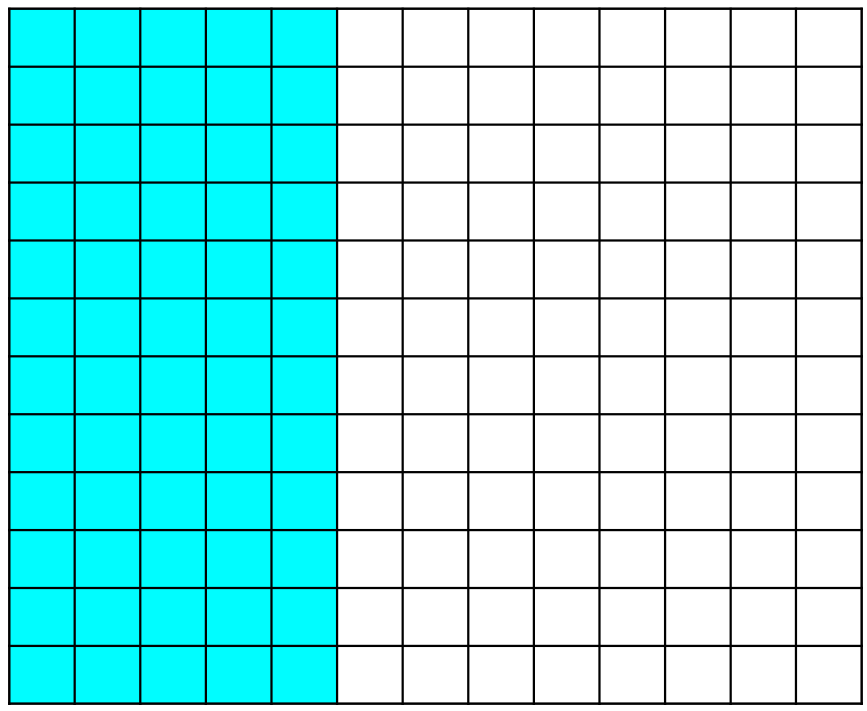
	12s Facts
x1	12 x 1 = 12
x2	12 x 2 = 24
x3	12 x 3 = 36
x4	12 x 4 = 48
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

LET'S DO ONE MORE TOGETHER...



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

Find the product of 12×5 using the **distributive property**.
Draw an area model in your math journal.

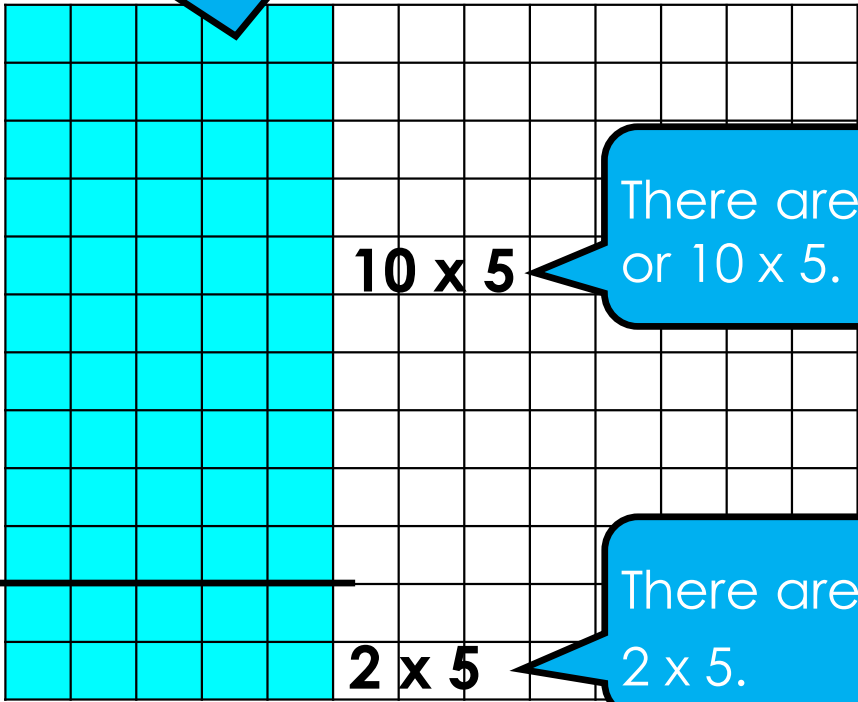


	12s Facts
x1	$12 \times 1 = 12$
x2	$12 \times 2 = 24$
x3	$12 \times 3 = 36$
x4	$12 \times 4 = 48$
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

 **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 2s facts.



There are 10 groups of 5 or 10×5 .

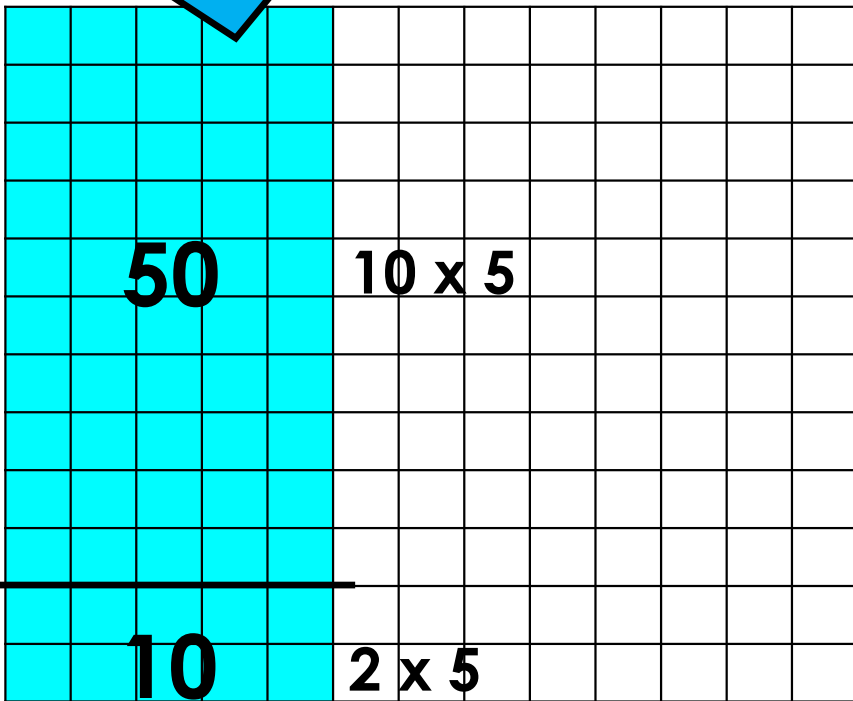
There are 2 groups of 5 or 2×5 .

	12s Facts
x1	$12 \times 1 = 12$
x2	$12 \times 2 = 24$
x3	$12 \times 3 = 36$
x4	$12 \times 4 = 48$
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 2s facts.



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

STEP 2 Find both products.

$$12 \times 5 = (10 \times 5) + (2 \times 5)$$

50

10

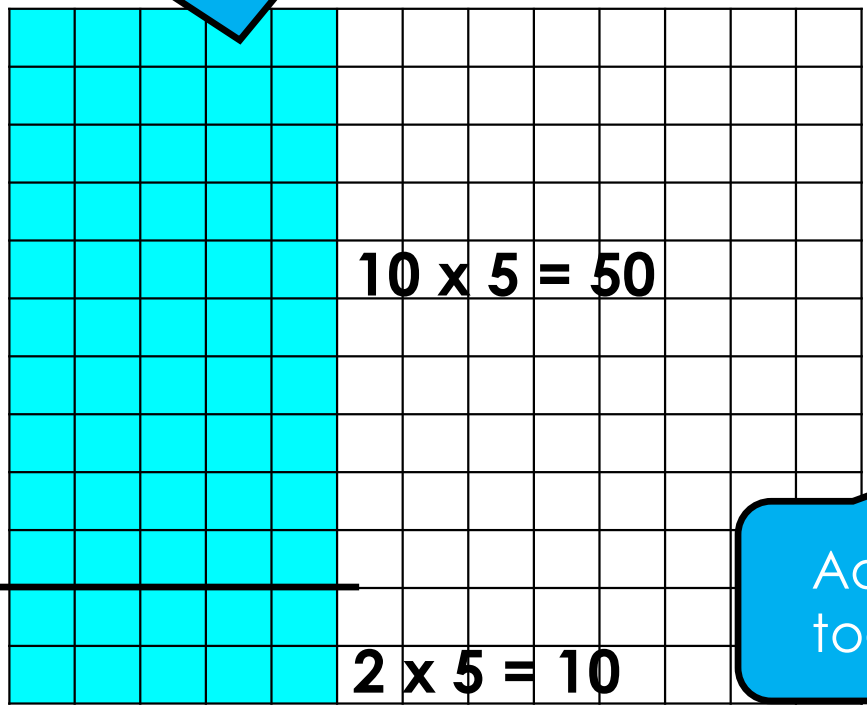
12s Facts	
x1	$12 \times 1 = 12$
x2	$12 \times 2 = 24$
x3	$12 \times 3 = 36$
x4	$12 \times 4 = 48$
x5	
x6	
x7	
x8	
x9	
x10	
x11	
x12	

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

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

STEP 1

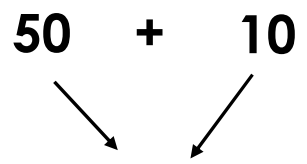
We need to decompose to find the related 10s and 2s facts.



STEP 2

Find both products.

$$12 \times 5 = (10 \times 5) + (2 \times 5)$$



STEP 3

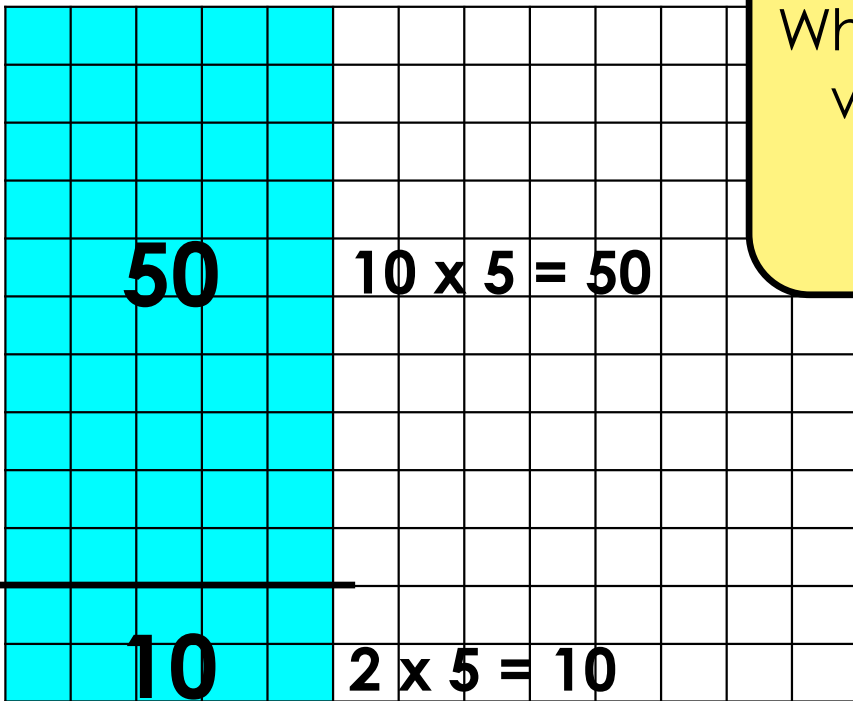
$12 \times 5 = 60$

Add the products together to find 12×5 .

12s Facts	
x1	$12 \times 1 = 12$
x2	$12 \times 2 = 24$
x3	$12 \times 3 = 36$
x4	$12 \times 4 = 48$
x5	$12 \times 5 = 60$
x6	
x7	
x8	
x9	
x10	
x11	
x12	

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

$12 \times 5 = 60$



What patterns do you notice when multiplying by 12s? Record in your journals.

12s Facts	
x1	$12 \times 1 = 12$
x2	$12 \times 2 = 24$
x3	$12 \times 3 = 36$
x4	$12 \times 4 = 48$
x5	$12 \times 5 = 60$
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

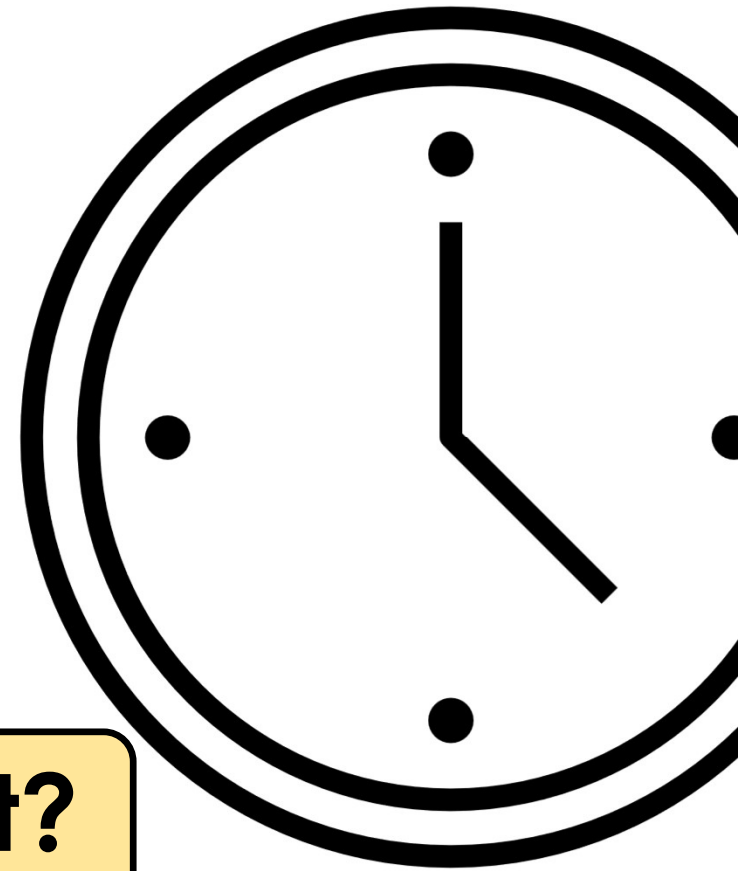


Now It's **“YOUR TURN”** to Solve



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 12×6 . Fill in the chart.





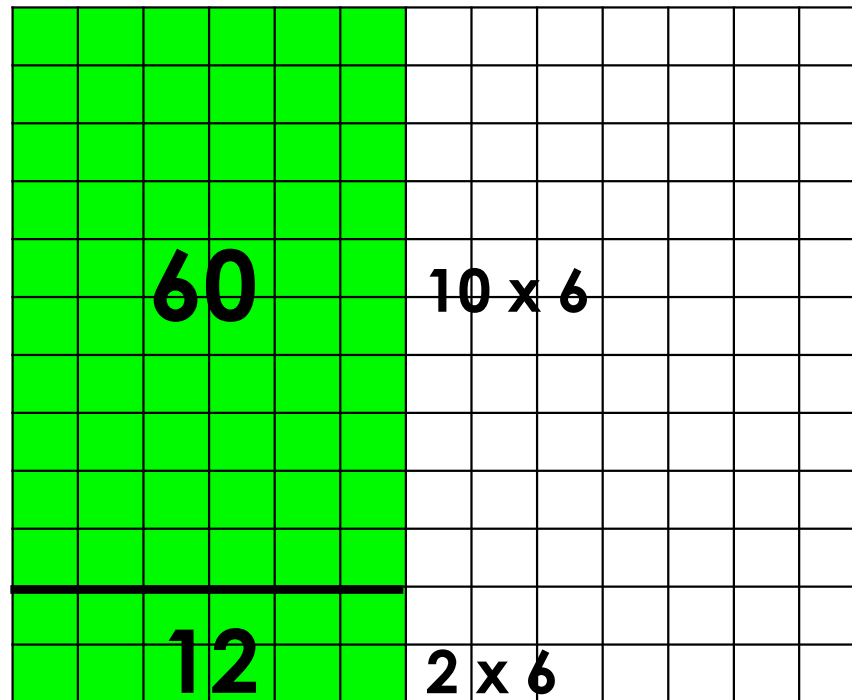
Problem #1

YOUR TURN

Use the distributive property to find the product of 12×6 . Fill in the chart.

	12s Facts
x1	$12 \times 1 = 12$
x2	$12 \times 2 = 24$
x3	$12 \times 3 = 36$
x4	$12 \times 4 = 48$
x5	$12 \times 5 = 60$
x6	$12 \times 6 = 72$
x7	
x8	
x9	
x10	
x11	
x12	

DRAW



RECORD & SOLVE

$$12 \times 6 = (10 \times 6) + (2 \times 6)$$

$$60 + 12$$

$$12 \times 6 = 72$$



Problem #2

YOUR TURN

Use the distributive property to find the product of 12×7 . Fill in the chart.





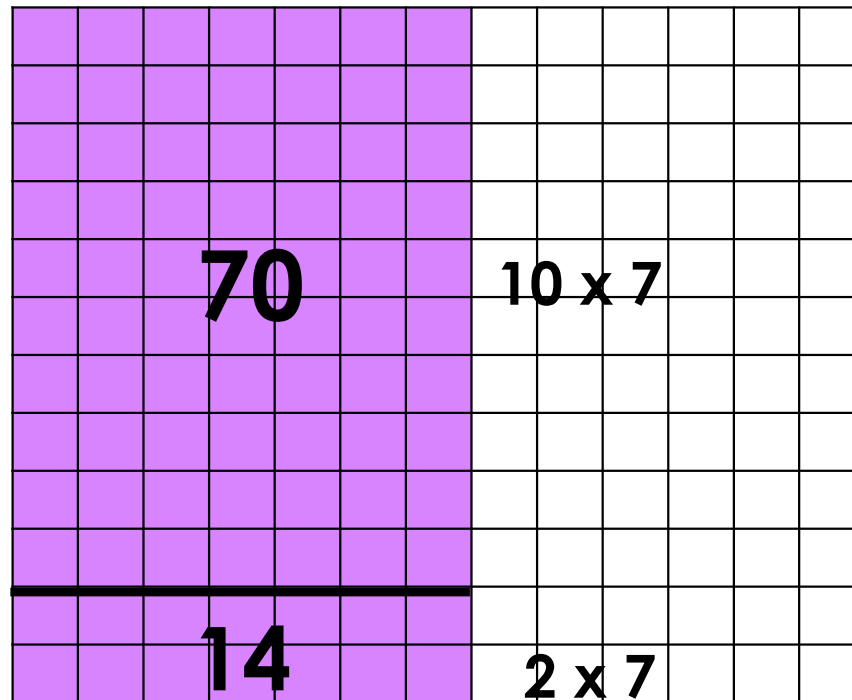
Problem #2

YOUR TURN

Use the distributive property to find the product of 12×7 . Fill in the chart.

	12s Facts
x1	$12 \times 1 = 12$
x2	$12 \times 2 = 24$
x3	$12 \times 3 = 36$
x4	$12 \times 4 = 48$
x5	$12 \times 5 = 60$
x6	$12 \times 6 = 72$
x7	$12 \times 7 = 84$
x8	
x9	
x10	
x11	
x12	

DRAW



RECORD & SOLVE

$$12 \times 7 = (10 \times 7) + (2 \times 7)$$

$$70 + 14$$

$$12 \times 7 = 84$$



Problem #3

YOUR TURN

Use the distributive property to find the product of 12×8 . Fill in the chart.





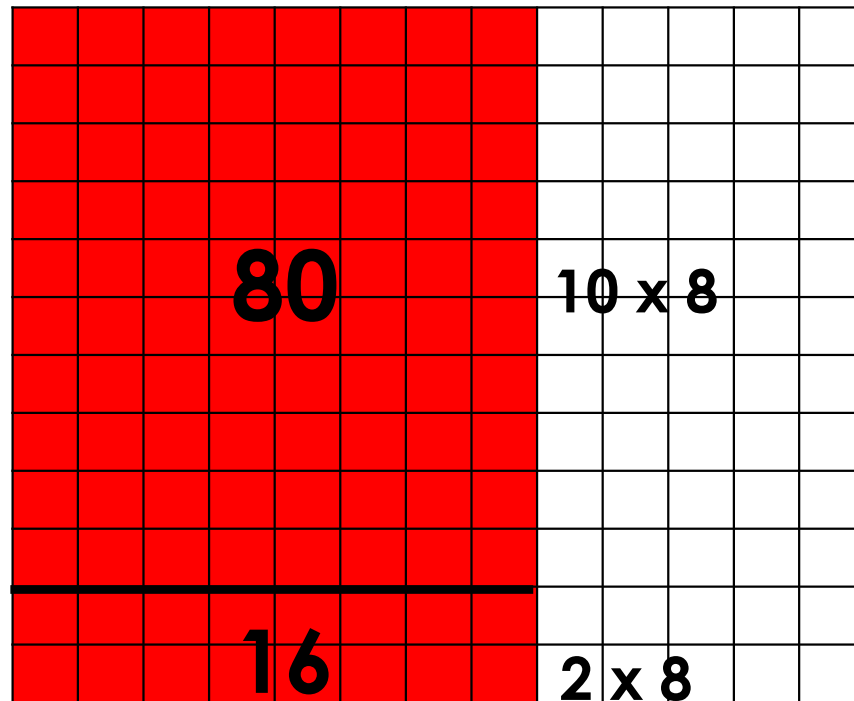
Problem #3

YOUR TURN

Use the distributive property to find the product of 12×8 . Fill in the chart.

	12s Facts
x1	$12 \times 1 = 12$
x2	$12 \times 2 = 24$
x3	$12 \times 3 = 36$
x4	$12 \times 4 = 48$
x5	$12 \times 5 = 60$
x6	$12 \times 6 = 72$
x7	$12 \times 7 = 84$
x8	$12 \times 8 = 96$
x9	
x10	
x11	
x12	

DRAW



RECORD & SOLVE

$$12 \times 8 = (10 \times 8) + (2 \times 8)$$

$$80 + 16$$

$$12 \times 8 = 96$$



Problem #4

YOUR TURN

Use the distributive property to find the product of 12×9 . Fill in the chart.





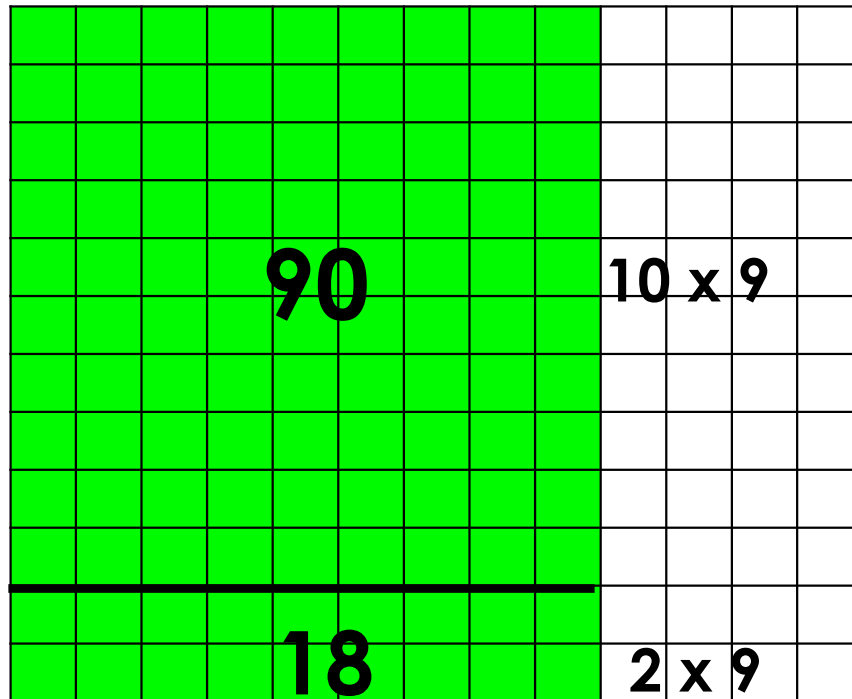
Problem #4

YOUR TURN

Use the distributive property to find the product of 12×9 . Fill in the chart.

	12s Facts
x1	$12 \times 1 = 12$
x2	$12 \times 2 = 24$
x3	$12 \times 3 = 36$
x4	$12 \times 4 = 48$
x5	$12 \times 5 = 60$
x6	$12 \times 6 = 72$
x7	$12 \times 7 = 84$
x8	$12 \times 8 = 96$
x9	$12 \times 9 = 108$
x10	
x11	
x12	

DRAW



RECORD & SOLVE

$$12 \times 9 = (10 \times 9) + (2 \times 9)$$

$$90 + 18$$

$$12 \times 9 = 108$$



Problem #5

YOUR TURN

Use the distributive property to find the product of 12×10 . Fill in the chart.





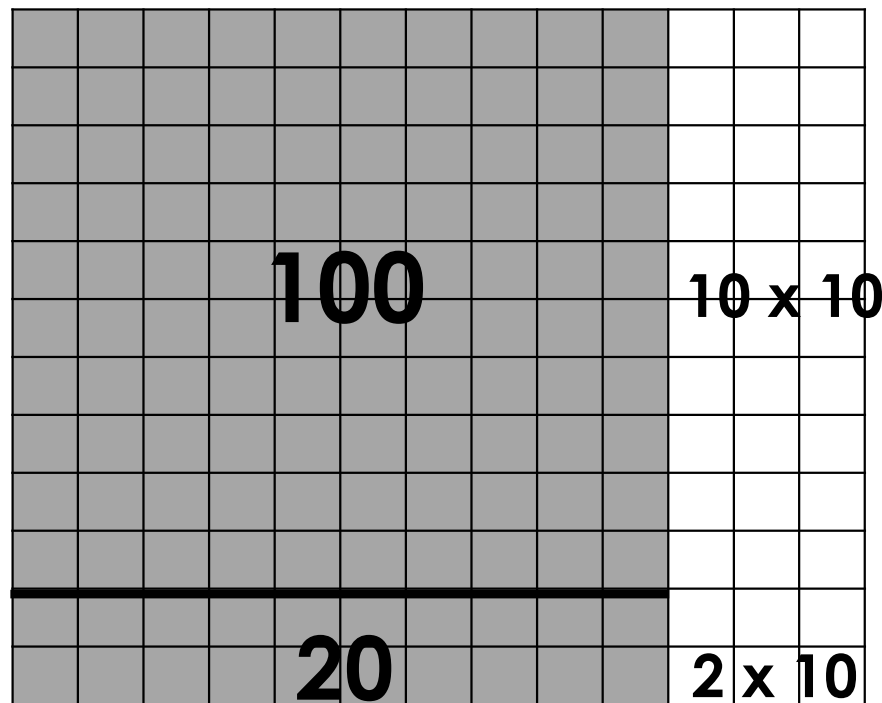
Problem #5

YOUR TURN

Use the distributive property to find the product of 12×10 . Fill in the chart.

	12s Facts
x1	$12 \times 1 = 12$
x2	$12 \times 2 = 24$
x3	$12 \times 3 = 36$
x4	$12 \times 4 = 48$
x5	$12 \times 5 = 60$
x6	$12 \times 6 = 72$
x7	$12 \times 7 = 84$
x8	$12 \times 8 = 96$
x9	$12 \times 9 = 108$
x10	$12 \times 10 = 120$
x11	
x12	

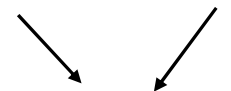
DRAW



RECORD & SOLVE

$$12 \times 10 = (10 \times 10) + (2 \times 10)$$

$$100 + 20$$



$$12 \times 10 = 120$$



Problem #6

YOUR TURN

Use the distributive property to find the product of 12×11 . Fill in the chart.





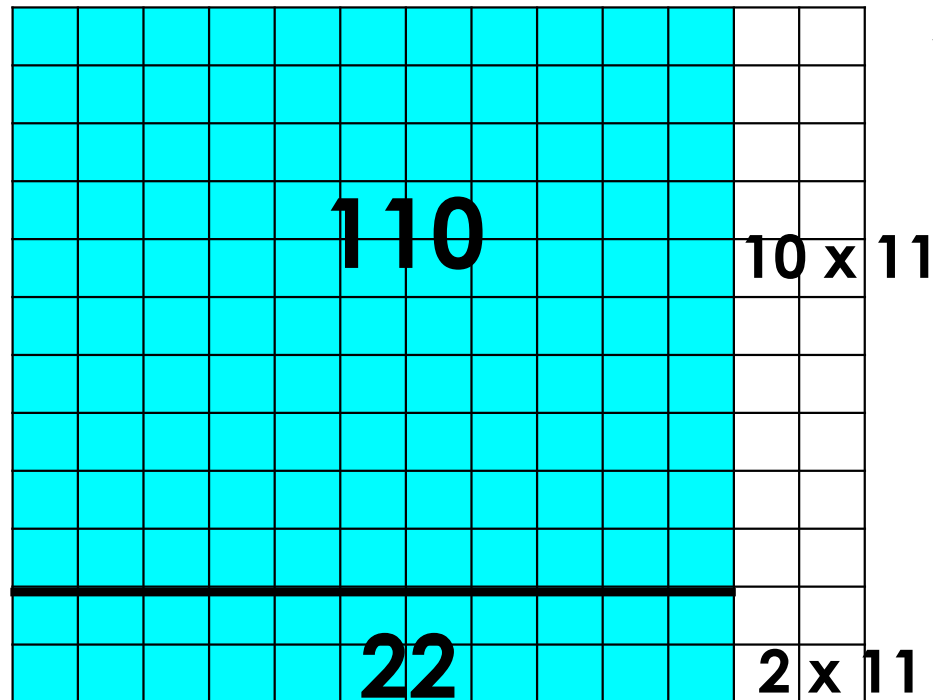
Problem #6

YOUR TURN

Use the distributive property to find the product of 12×11 . Fill in the chart.

	12s Facts
x1	$12 \times 1 = 12$
x2	$12 \times 2 = 24$
x3	$12 \times 3 = 36$
x4	$12 \times 4 = 48$
x5	$12 \times 5 = 60$
x6	$12 \times 6 = 72$
x7	$12 \times 7 = 84$
x8	$12 \times 8 = 96$
x9	$12 \times 9 = 108$
x10	$12 \times 10 = 120$
x11	$12 \times 11 = 132$
x12	

DRAW



RECORD & SOLVE

$$12 \times 11 = (10 \times 11) + (2 \times 11)$$

$$110 + 22$$

$$12 \times 11 = 132$$



Problem #7

YOUR TURN

Use the distributive property to find the product of 12×12 . Fill in the chart.





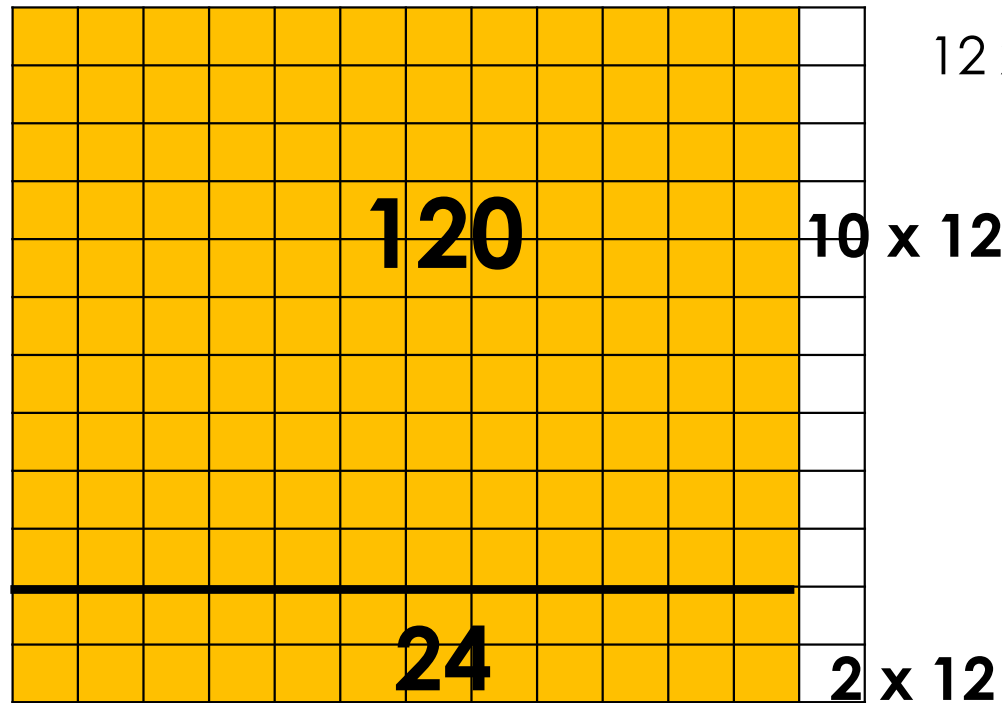
Problem #7

YOUR TURN

Use the distributive property to find the product of 12×12 . Fill in the chart.

	12s Facts
x1	$12 \times 1 = 12$
x2	$12 \times 2 = 24$
x3	$12 \times 3 = 36$
x4	$12 \times 4 = 48$
x5	$12 \times 5 = 60$
x6	$12 \times 6 = 72$
x7	$12 \times 7 = 84$
x8	$12 \times 8 = 96$
x9	$12 \times 9 = 108$
x10	$12 \times 10 = 120$
x11	$12 \times 11 = 132$
x12	$12 \times 12 = 144$

DRAW



RECORD & SOLVE

$$12 \times 12 = (10 \times 12) + (2 \times 12)$$

$$120 + 24$$

$$12 \times 12 = 144$$



Problem #8

YOUR TURN

Explain the strategy we used to solve the 12 times tables.





Problem #8

YOUR TURN

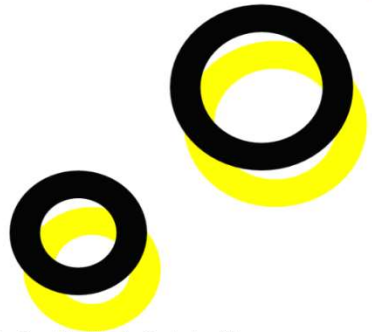
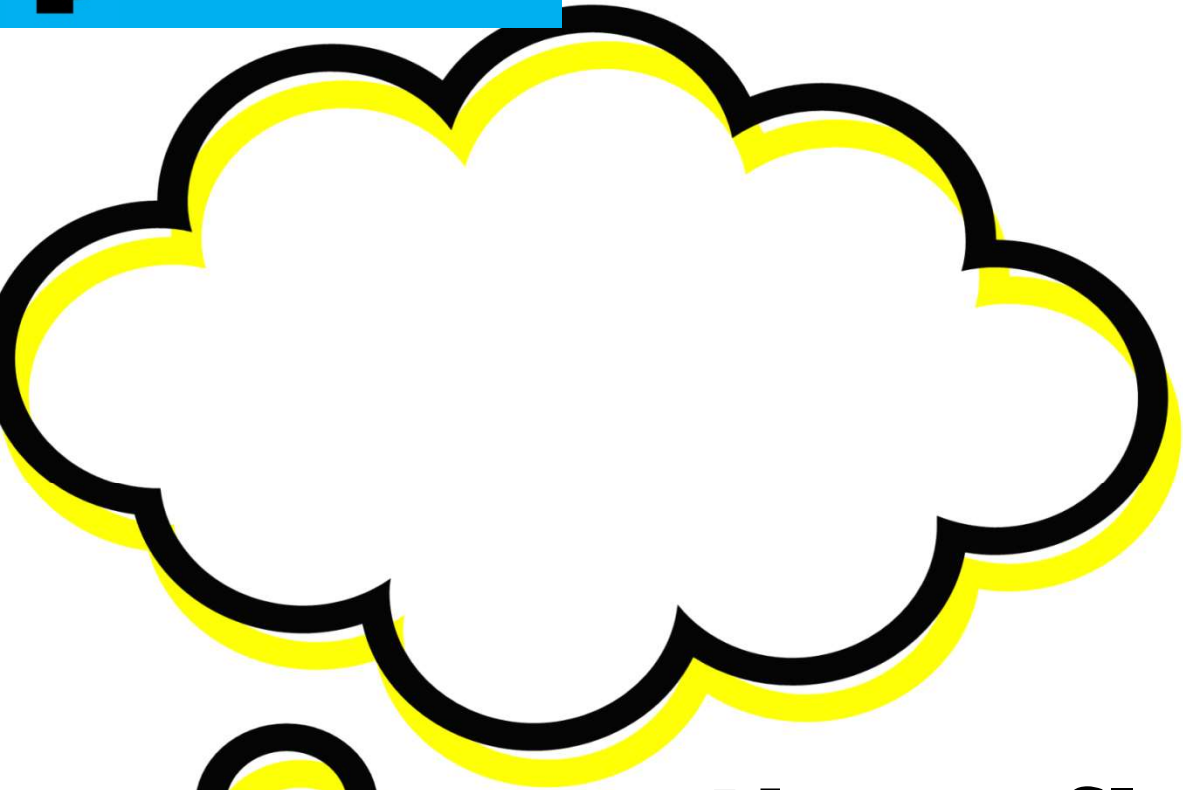
Explain the strategy we used to solve the 12 times tables.

Answers May Vary

We can use the distributive property to solve. We can add the products of the related 10s and 2s facts. By adding these together we will find the products of the 12s facts.



 **Let's Reflect**



It's reflection time!