MULTIPLICATION

FACT FLUENCY

EXPLORE THE 9s TIMES TABLE

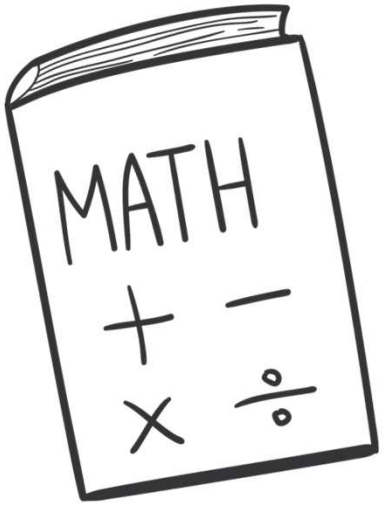
LESSON 11

TODAY'S OBJECTIVE

Today we will explore subtracting a group as a strategy to solve the 9s times table facts.

TAKE OUT YOUR

MATH JOURNALS



Today we'll use the 10s and 1s facts to find the products of the 9s facts.

WATCH ME FIRST

Let's review related facts.

In this table, I'm going to pair the 9s facts with the related 10s facts by replacing the 9s with 10s.

Which 10s fact is related to 9 x 2?

10 x 2 is related to **9 x 2**

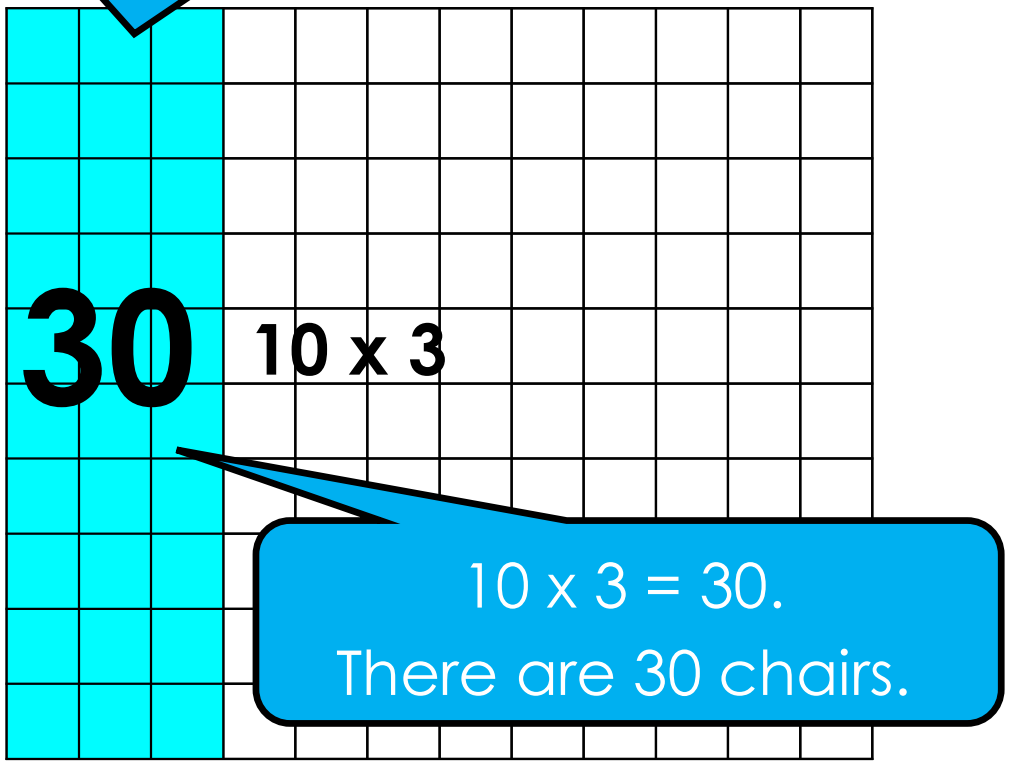
Multiplying by 9s	Multiplying by 10s
9 x 1	10 x 1
9 x 2	10 x 2
9 x 3	10 x 3
9 x 4	10 x 4
9 x 5	10 x 5
9 x 6	10 x 6
9 x 7	10 x 7
9 x 8	10 x 8
9 x 9	10 x 9
9 x 10	10 x 10
9 x 11	10 x 11
9 x 12	10 x 12

Now watch as I solve a 9s facts problem, using the related 10s fact.

WATCH ME FIRST

For class, Ms. Smith arranged 10 rows of chairs. She put 3 chairs in each row. I'll create a model to show her arrangement with one square representing one chair. Then I'll record the matching multiplication fact.

There are 10 groups of 3, or 10 x 3

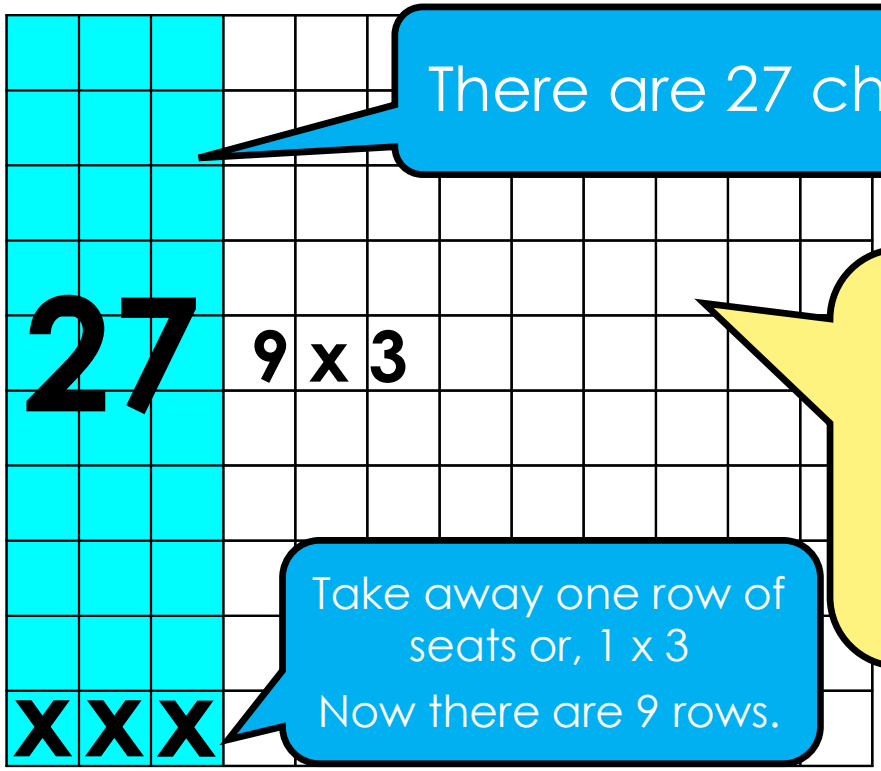


10 x 3 = 30.
There are 30 chairs.

9s Facts	10s Facts
	10 x 3 = 30

WATCH ME FIRST

Ms. Smith found out 3 students were absent, so she took away 3 seats. Now there are 9 rows of chairs, with 3 seats in each row. I'll update the model and record the new multiplication fact.



Now, I'll create an equation to solve.

$(10 \times 3) - (1 \times 3)$

$30 - 3 = 27$

So... 9 x 3 = 27

9s Facts	10s Facts
9 x 3 = 27	10 x 3 = 30

LET'S WORK TOGETHER

Let's Review!

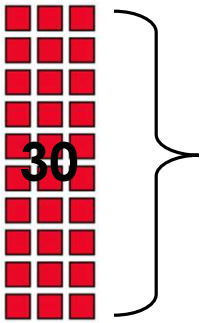
We can solve the 9s facts by using the related 10s and 1s facts:

1st – Find the related 10s fact.

2nd – Subtract one group (1s fact) to solve the 9s fact.

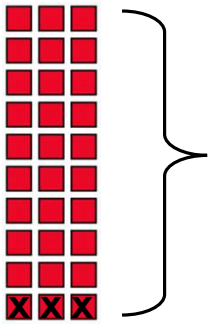
EXAMPLE: Find the product of **9 x 3**

STEP 1 **9 x 3** is related to 10 x 3



10 x 3

STEP 2 Subtract one group from the 10s fact



9 x 3 = (10 x 3) – (1 x 3)

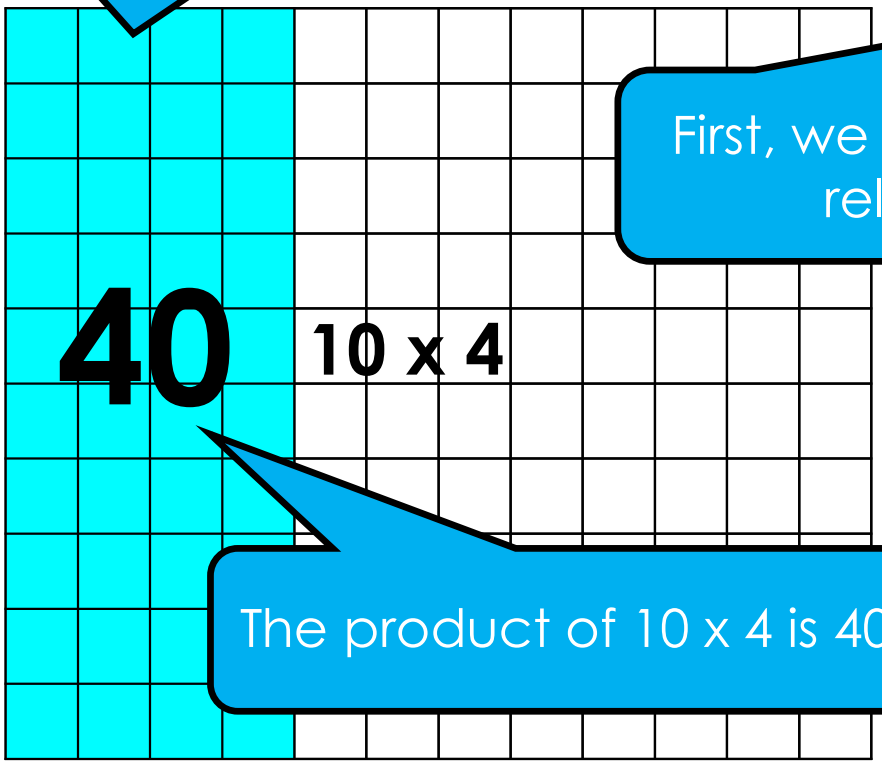
30 – 3

9 x 3 = **27**

Problem #1
LET'S WORK TOGETHER

If we want to find the product of **9 x 4** using this strategy, what should we do first? Record in your journal.

10 x 4 is related to 9 x 4



First, we need to identify the related 10s fact.

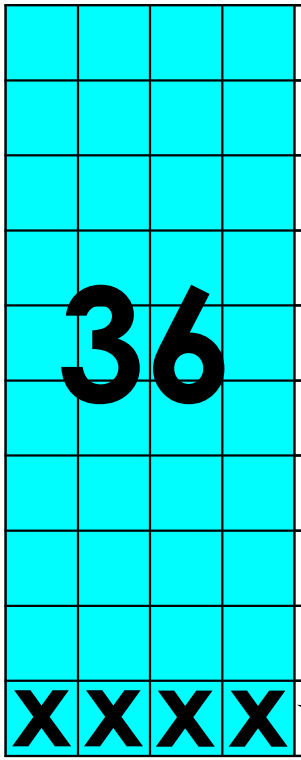
The product of 10 x 4 is 40.

9s Facts	10s Facts
9 x 3 = 27	10 x 3 = 30
	10 x 4 = 40

Problem #1
LET'S WORK TOGETHER

What's the last step?

Now there are 9 groups of 4 or 9 x 4.



Let's record:

(10 x 4) – (1 x 4)

40 – 4 = **36**

So... 9 x 4 = 36

Take away 1 group of 4 or 1 x 4.

9s Facts	10s Facts
9 x 3 = 27	10 x 3 = 30
9 x 4 = 36	**10 x 4 = 40**

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

LET'S WORK TOGETHER

Based on previous lessons, what other strategy can we use to find the product of **9 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 products of the 4s facts.

9s Facts	10s Facts
9 x 3 = 27	10 x 3 = 30
9 x 4 = 36	10 x 4 = 40

STEP 1

9 x 2 is related to **9 x 4**

9 x 2 = 18

STEP 2

Double 18.

18 + 18 = 36

STEP 3

9 x 4 = 36

Let's think of other strategies we learned in previous lessons, to solve 9 x 1 and 9 x 2.

LET'S WORK TOGETHER

Based on previous lessons, what strategy can we use to find the product of **9 x 1**? Explain.

We can use the **identity property** of multiplication to solve. Any number multiplied by 1 equals that number. So… 9 x 1 = 9 and 1 x 9 = 9 .

9s Facts	10s Facts
9 x 1 = 9	10 x 1 = 10
	10 x 2 = 20
9 x 3 = 27	10 x 3 = 30
9 x 4 = 36	10 x 4 = 40

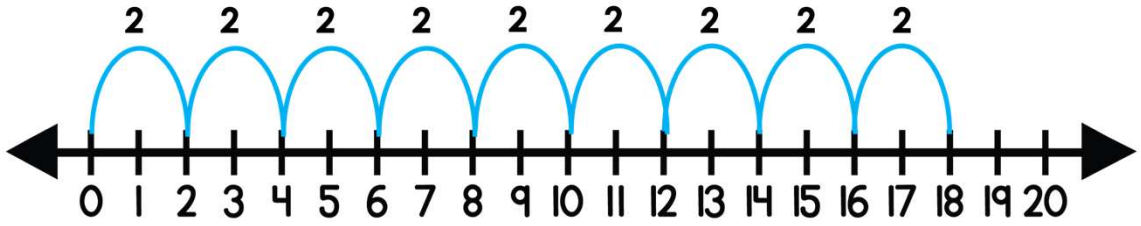
LET'S WORK TOGETHER

Based on previous lessons, what strategy can we use to find the product of **9 x 2**? Explain.

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

9 + 9 = <u>18</u> then, 9 x 2 = <u>18</u> and, 2 x 9 = <u>18</u>

We can also skip count by 2s.



9s Facts	10s Facts
9 x 1 = 9	10 x 1 = 10
9 x 2 = 18	10 x 2 = 20
9 x 3 = 27	10 x 3 = 30
9 x 4 = 36	10 x 4 = 40

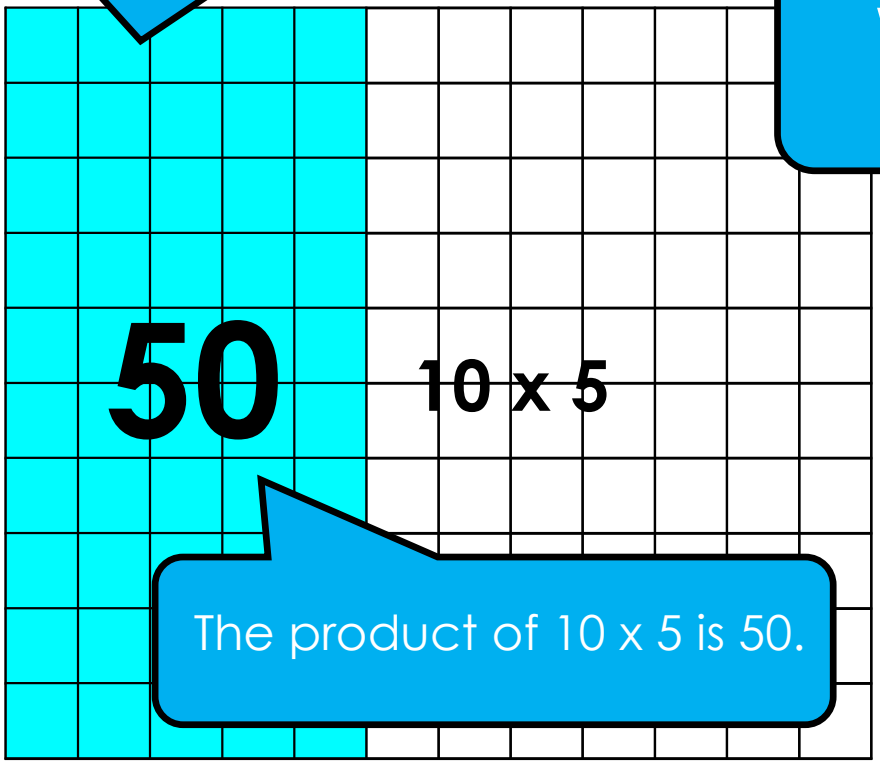
Let's find the product of **9 x 5** together.

Problem #2
LET'S WORK TOGETHER

Find **9 x 5**. What do we need to do first?

10 x 5 is related to 9 x 5

We need to identify the related 10s fact.

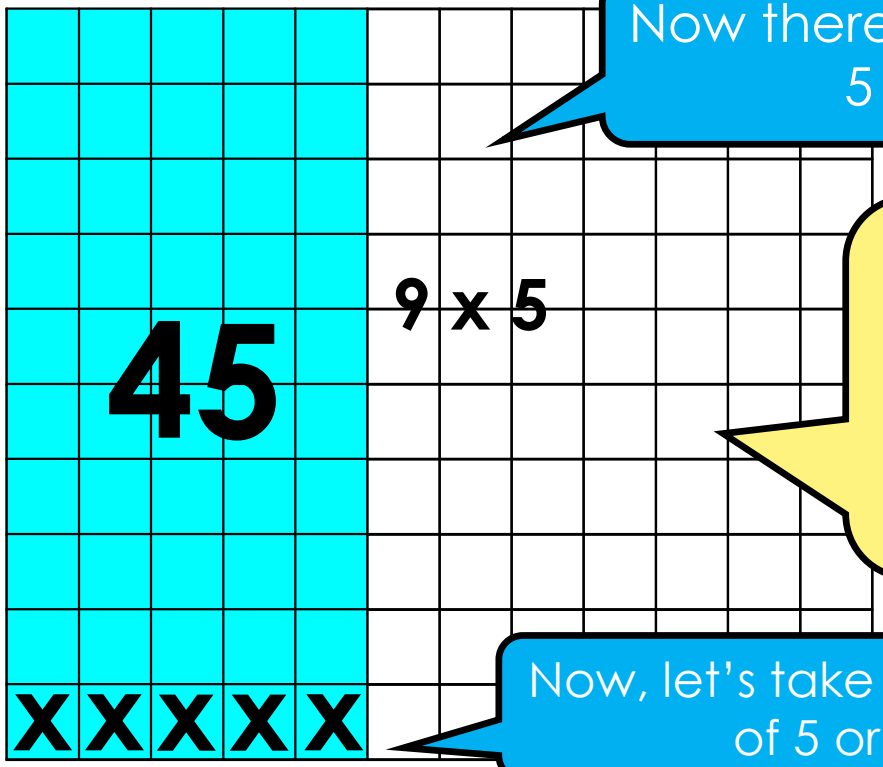


The product of 10 x 5 is 50.

9s Facts	10s Facts
9 x 1 = 9	10 x 1 = 10
9 x 2 = 18	10 x 2 = 20
9 x 3 = 27	10 x 3 = 30
9 x 4 = 36	10 x 4 = 40
	10 x 5 = 50

Problem #2
LET'S WORK TOGETHER

What's the last step?



Now there are 9 groups of 5 or 9 x 5.

Let's record...

(10 x 5) – (1 x 5)

50 – 5 = 45

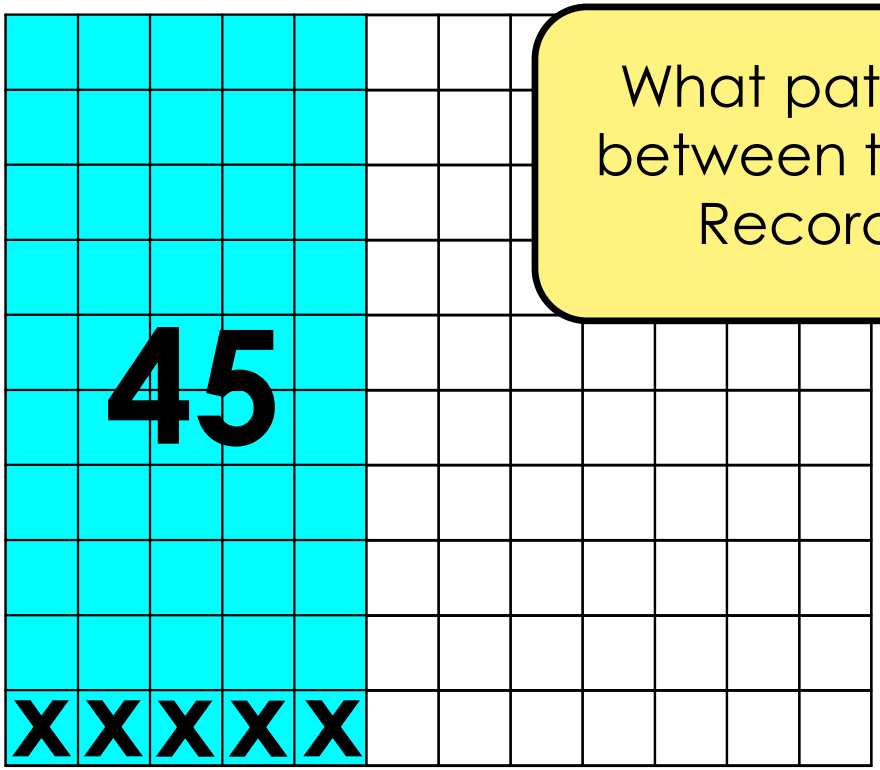
So... 9 x 5 = 45

Now, let's take away 1 group of 5 or 1 x 5.

9s Facts	10s Facts
9 x 1 = 9	10 x 1 = 10
9 x 2 = 18	10 x 2 = 20
9 x 3 = 27	10 x 3 = 30
9 x 4 = 36	10 x 4 = 40
9 x 5 = 45	**10 x 5 = 50**

Problem #2
LET'S WORK TOGETHER

9 x 5

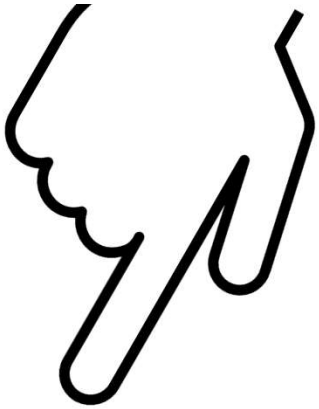


What patterns do you notice between the 9s and 10s facts? Record in your journals.

9s Facts	10s Facts
9 x 1 = 9	10 x 1 = 10
9 x 2 = 18	10 x 2 = 20
9 x 3 = 27	10 x 3 = 30
9 x 4 = 36	10 x 4 = 40
9 x 5 = 45	**10 x 5 = 50**

CHECK - IN

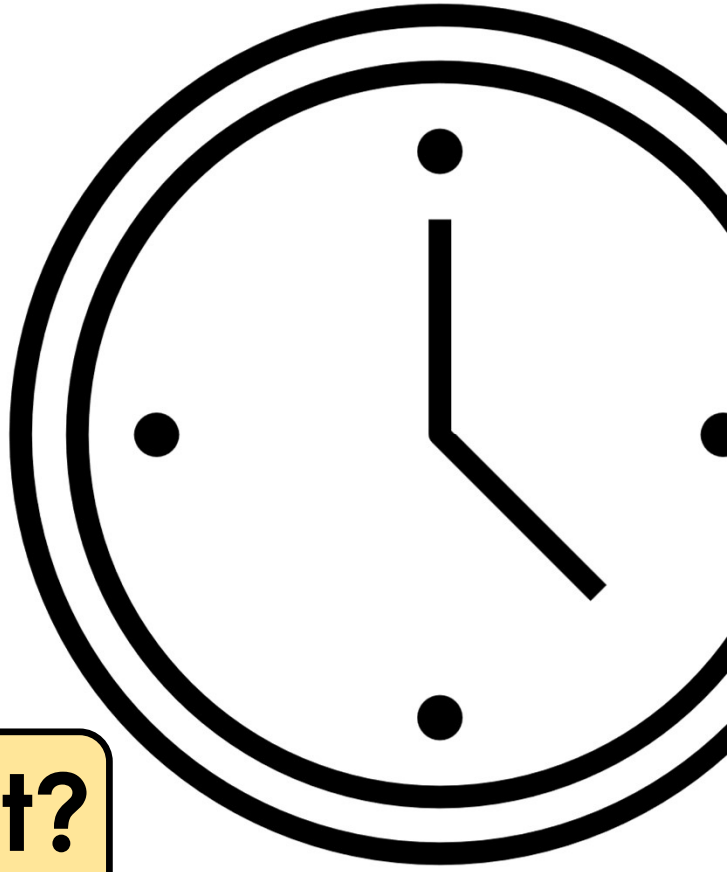
- What did you notice?
- Can you make a connection to anything else you already know? How?
- Do you have any questions?



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?

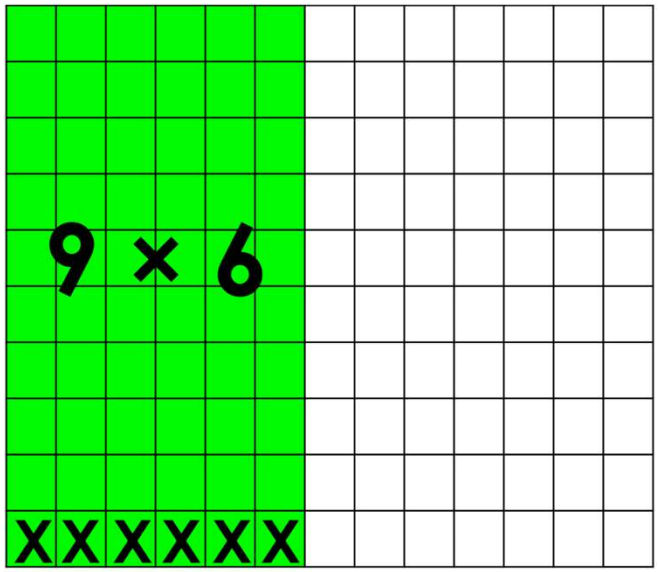
Problem #1
YOUR TURN

Use the strategy we just learned to find the product of 9 × 6. Fill in the chart.

Problem #1
YOUR TURN

Use the strategy we just learned to find the product of 9 × 6. Fill in the chart.

DRAW



9 x 6 is related to 10 x 6 and 10 x 6 = 60.

RECORD & SOLVE

9 x 6 = (10 x 6) − (1 x 6)

60 − 6

9 x 6 = 54

9s Facts	10s Facts
9 x 1 = 9	10 x 1 = 10
9 x 2 = 18	10 x 2 = 20
9 x 3 = 27	10 x 3 = 30
9 x 4 = 36	10 x 4 = 40
9 x 5 = 45	10 x 5 = 50
9 x 6 = 54	**10 x 6 = 60**

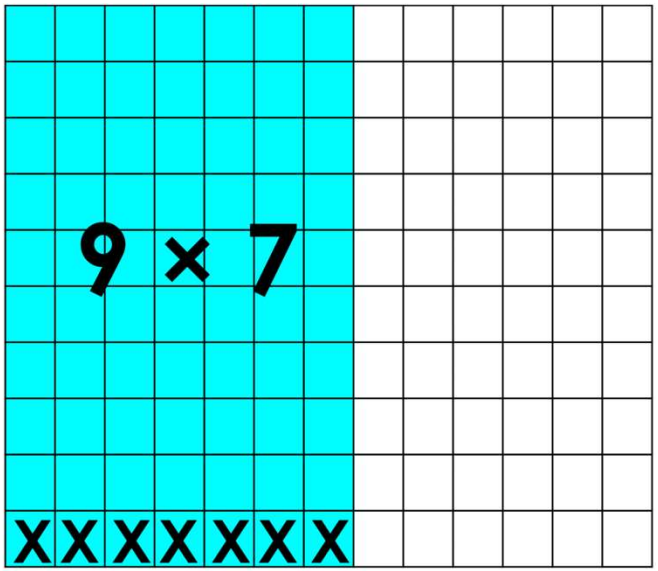
Problem #2
YOUR TURN

Use the strategy we just learned to find the product of 9 × 7. Fill in the chart.

Problem #2
YOUR TURN

Use the strategy we just learned to find the product of 9 × 7. Fill in the chart.

DRAW



9 x 7 is related to 10 x 7 and 10 x 7 = 70.

RECORD & SOLVE

9 x 7 = (10 x 7) − (1 x 7)

70 − 7

9 x 7 = 63

9s Facts	10s Facts
9 x 1 = 9	10 x 1 = 10
9 x 2 = 18	10 x 2 = 20
9 x 3 = 27	10 x 3 = 30
9 x 4 = 36	10 x 4 = 40
9 x 5 = 45	10 x 5 = 50
9 x 6 = 54	10 x 6 = 60
9 x 7 = 63	**10 x 7 = 70**

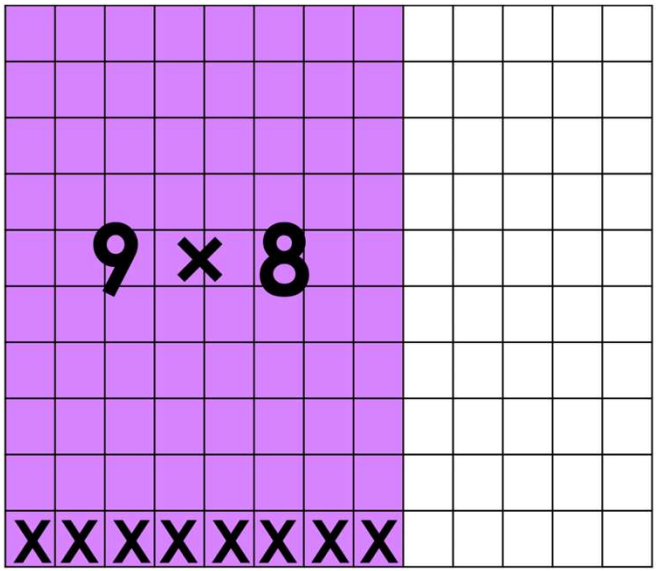
Problem #3
YOUR TURN

Use the strategy we just learned to find the product of 9 × 8. Fill in the chart.

Problem #3
YOUR TURN

Use the strategy we just learned to find the product of 9 × 8. Fill in the chart.

DRAW



9 x 8 is related to 10 x 8 and 10 x 8 = 80.

RECORD & SOLVE

9 x 8 = (10 x 8) − (1 x 8)

80 − 8

9 x 8 = 72

9s Facts	10s Facts
9 x 1 = 9	10 x 1 = 10
9 x 2 = 18	10 x 2 = 20
9 x 3 = 27	10 x 3 = 30
9 x 4 = 36	10 x 4 = 40
9 x 5 = 45	10 x 5 = 50
9 x 6 = 54	10 x 6 = 60
9 x 7 = 63	10 x 7 = 70
9 x 8 = 72	**10 x 8 = 80**

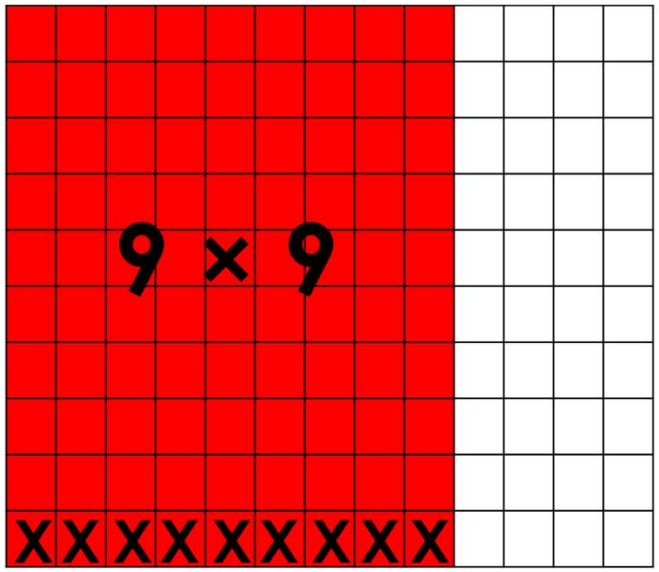
Problem #4
YOUR TURN

Use the strategy we just learned to find the product of 9 × 9. Fill in the chart.

Problem #4
YOUR TURN

Use the strategy we just learned to find the product of 9 × 9. Fill in the chart.

DRAW



9 x 9 is related to
10 x 9 and 10 x 9 = 90.

RECORD & SOLVE

9 x 9 = (10 x 9) − (1 x 9)

90 − 9

9 x 9 = 81

9s Facts	10s Facts
9 x 1 = 9	10 x 1 = 10
9 x 2 = 18	10 x 2 = 20
9 x 3 = 27	10 x 3 = 30
9 x 4 = 36	10 x 4 = 40
9 x 5 = 45	10 x 5 = 50
9 x 6 = 54	10 x 6 = 60
9 x 7 = 63	10 x 7 = 70
9 x 8 = 72	10 x 8 = 80
9 x 9 = 81	**10 x 9 = 90**

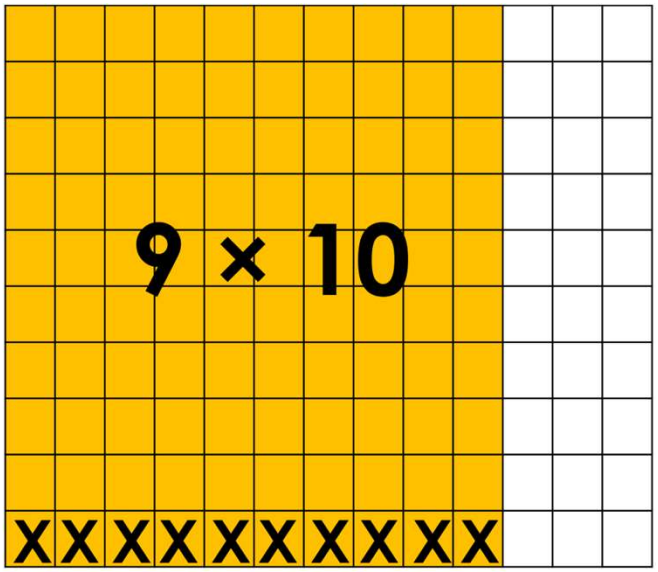
Problem #5
YOUR TURN

Use the strategy we just learned to find the product of 9 × 10. Fill in the chart.

Problem #5
YOUR TURN

Use the strategy we just learned to find the product of 9 × 10. Fill in the chart.

DRAW



9 x 10 is related to 10 x 10 and 10 x 10 = 100.

RECORD & SOLVE

9 x 10 = (10 x 10) − (1 x 10)

100 − 10

9 x 10 = 90

9s Facts	10s Facts
9 x 1 = 9	10 x 1 = 10
9 x 2 = 18	10 x 2 = 20
9 x 3 = 27	10 x 3 = 30
9 x 4 = 36	10 x 4 = 40
9 x 5 = 45	10 x 5 = 50
9 x 6 = 54	10 x 6 = 60
9 x 7 = 63	10 x 7 = 70
9 x 8 = 72	10 x 8 = 80
9 x 9 = 81	10 x 9 = 90
9 x 10 = 90	**10 x 10 = 100**

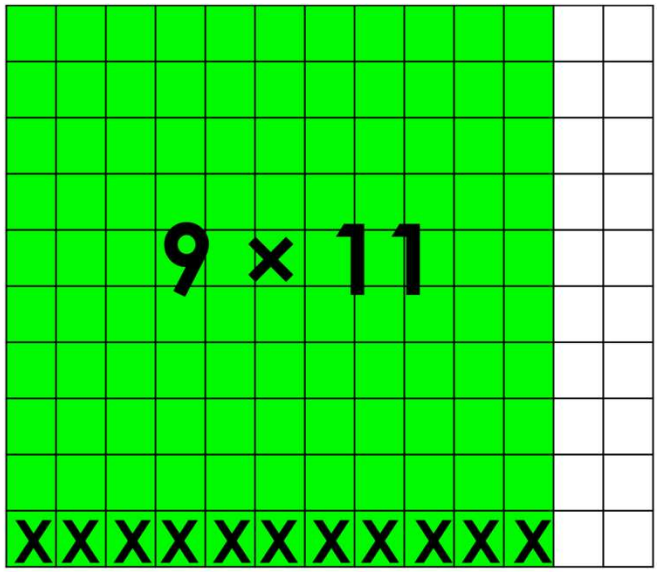
Problem #6
YOUR TURN

Use the strategy we just learned to find the product of 9 × 11. Fill in the chart.

Problem #6
YOUR TURN

Use the strategy we just learned to find the product of 9 × 11. Fill in the chart.

DRAW



9 x 11 is related to 10 x 11 and 10 x 11 = 110.

RECORD & SOLVE

9 x 11 = (10 x 11) – (1 x 11)

110 – 11

9 x 11 = 99

9s Facts	10s Facts
9 x 1 = 9	10 x 1 = 10
9 x 2 = 18	10 x 2 = 20
9 x 3 = 27	10 x 3 = 30
9 x 4 = 36	10 x 4 = 40
9 x 5 = 45	10 x 5 = 50
9 x 6 = 54	10 x 6 = 60
9 x 7 = 63	10 x 7 = 70
9 x 8 = 72	10 x 8 = 80
9 x 9 = 81	10 x 9 = 90
9 x 10 = 90	10 x 10 = 100
9 x 11 = 99	**10 x 11 = 110**

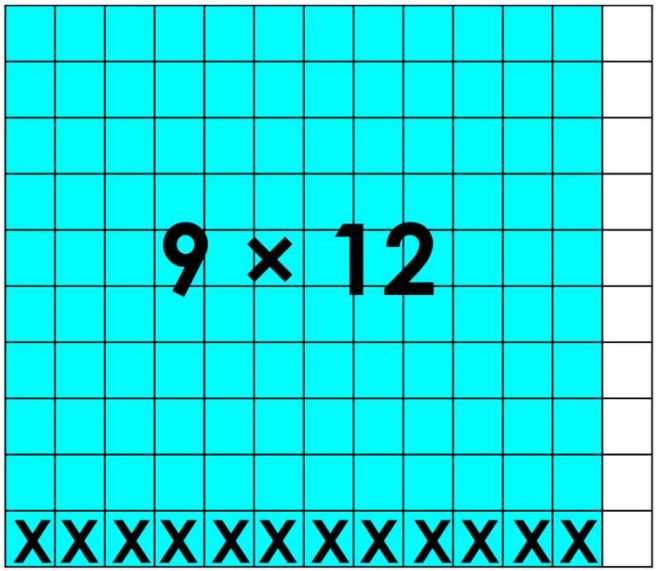
Problem #7
YOUR TURN

Use the strategy we just learned to find the product of 9 × 12. Fill in the chart.

Problem #7
YOUR TURN

Use the strategy we just learned to find the product of 9 × 12. Fill in the chart.

DRAW



9 x 12 is related to 10 x 12 and 10 x 10 = 120.

RECORD & SOLVE

9 x 12 = (10 x 12) – (1 x 12)

120 - 12

9 x 12 = 108

9s Facts	10s Facts
9 x 1 = 9	10 x 1 = 10
9 x 2 = 18	10 x 2 = 20
9 x 3 = 27	10 x 3 = 30
9 x 4 = 36	10 x 4 = 40
9 x 5 = 45	10 x 5 = 50
9 x 6 = 54	10 x 6 = 60
9 x 7 = 63	10 x 7 = 70
9 x 8 = 72	10 x 8 = 80
9 x 9 = 81	10 x 9 = 90
9 x 10 = 90	10 x 10 = 100
9 x 11 = 99	10 x 11 = 110
9 x 12 = 108	**10 x 12 = 120**

Problem #8
YOUR TURN

Explain the strategy we used to solve the 9s times table fact.

Problem #8
YOUR TURN

Explain the strategy we used to solve the 9s times table facts.

Answers May Vary

We could use the 10s times table and subtract one group to find the 9s fact.

Let's Reflect

It's reflection time!