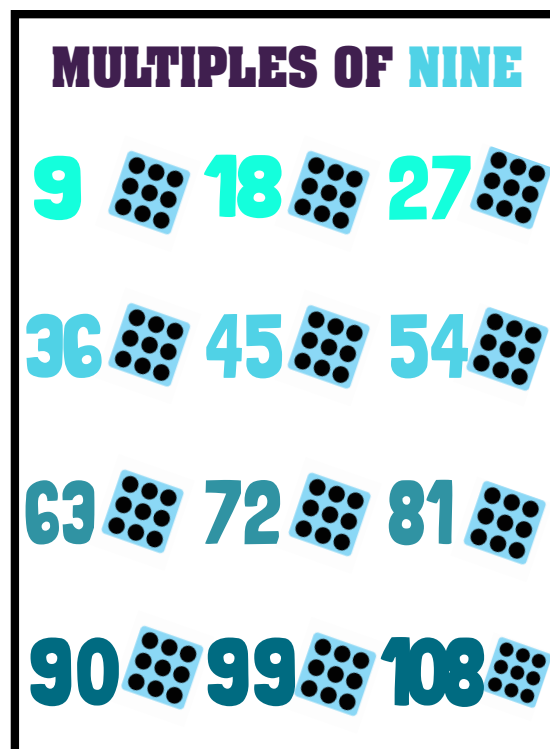
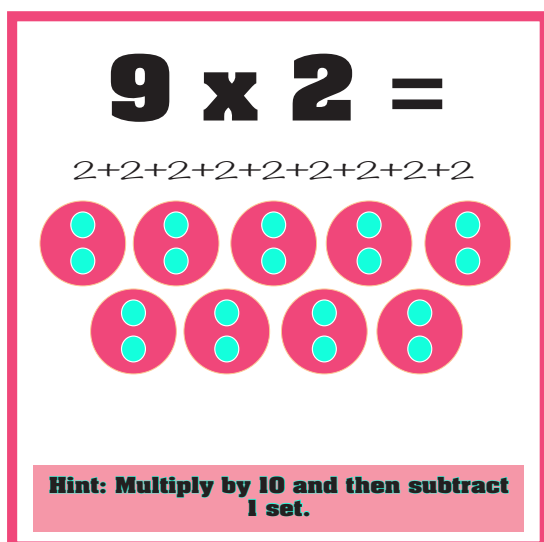
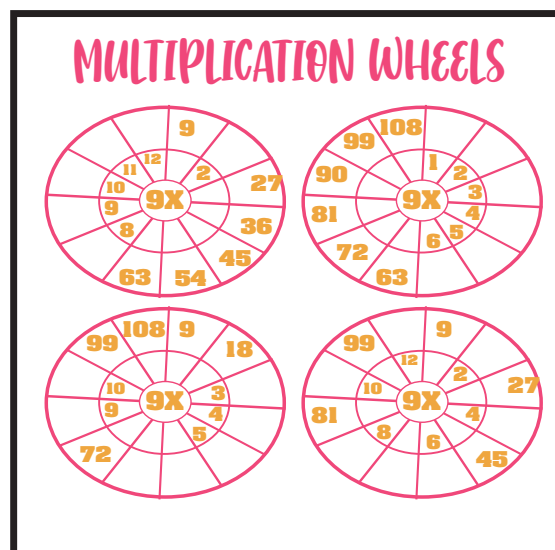


MULTIPLYING by 9

WORK BOOKLET ANSWER KEY

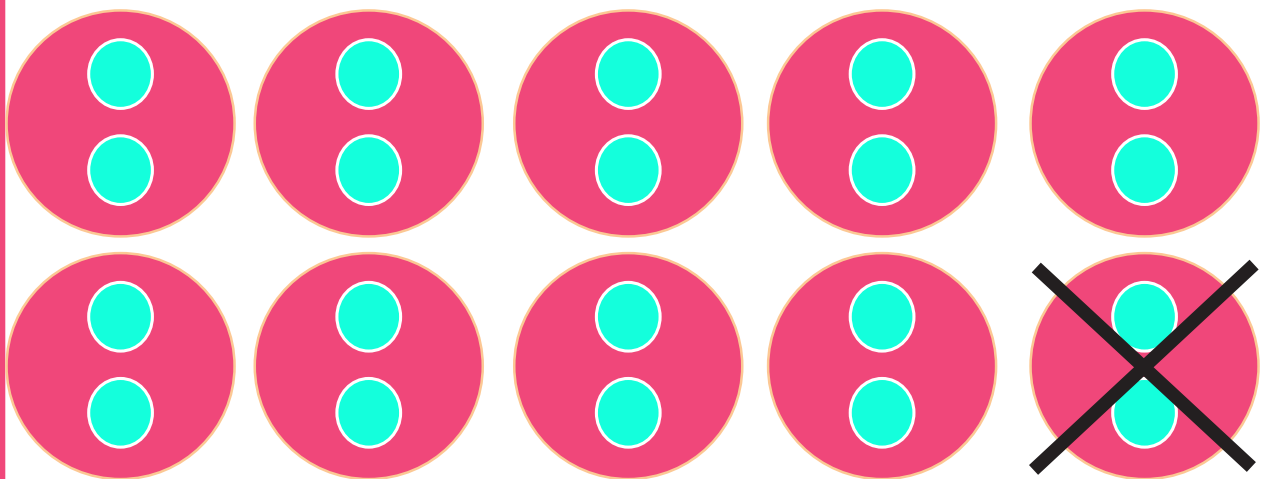


STRATEGY POSTER

When multiplying by **9**
Multiply by 10 and then subtract 1 set.

$$9 \times 2 =$$

$$2+2+2+2+2+2+2+2+2$$



Hint: Multiply by 10 and then subtract 1 set.

MULTIPLICATION

$$9 \times 5 = 45$$



FACTOR



FACTOR



PRODUCT

MULTIPLES OF NINE

9



18



27



36



45



54



63



72



81



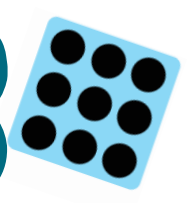
90



99



108



MULTIPLES OF NINE

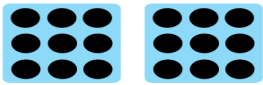
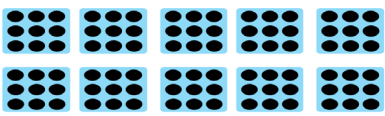
9 ○ 18 ○ 27 ○

36 ○ 45 ○ 54 ○

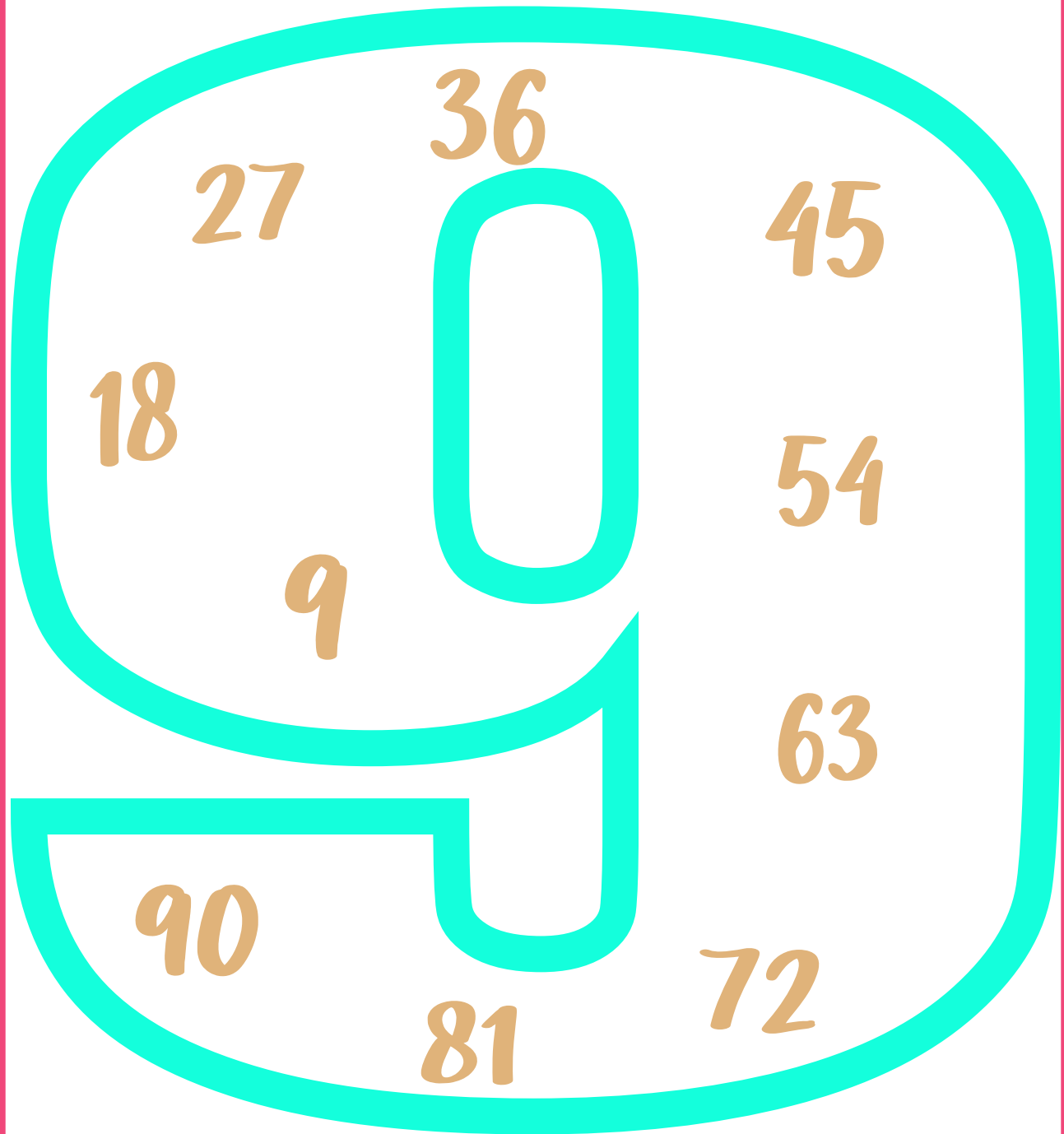
63 ○ 72 ○ 81 ○

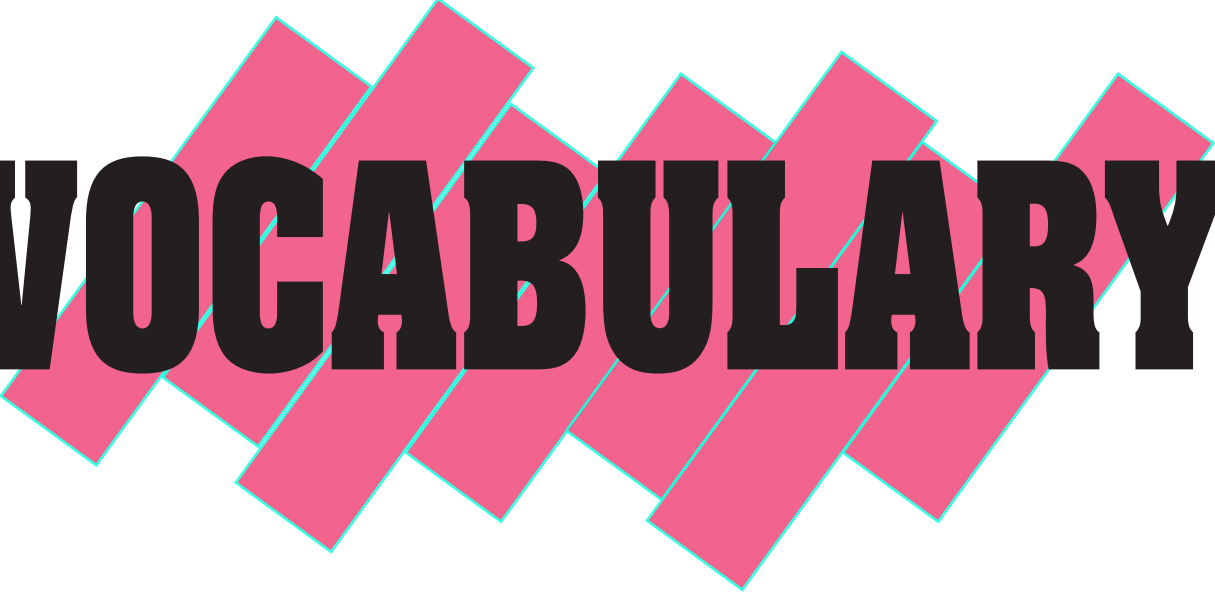
90 ○ 99 ○ 108 ○

PICTURING THE MATH

GROUP 9 DOTS ARE ON EACH DOMINO.	COUNT BY SEQUENCE	MULTIPLICATION EQUATION
If you have 2 dominos, how many dots would you have? 	9, 18	$2 \times 9 = 18$
If you have 6 dominos, how many dots would you have? 	9, 18, 27, 36, 45, 54	$6 \times 9 = 54$
If you have 8 dominos, how many dots would you have? 	9, 18, 27, 36, 45, 54, 63, 72	$8 \times 9 = 72$
If you have 4 dominos, how many dots would you have? 	9, 18, 27, 36,	$4 \times 9 = 36$
If you have 10 dominos, how many dots would you have? 	9, 18, 27, 36, 45, 54, 63, 72, 81, 90	$10 \times 9 = 90$

MULTIPLES OF 9





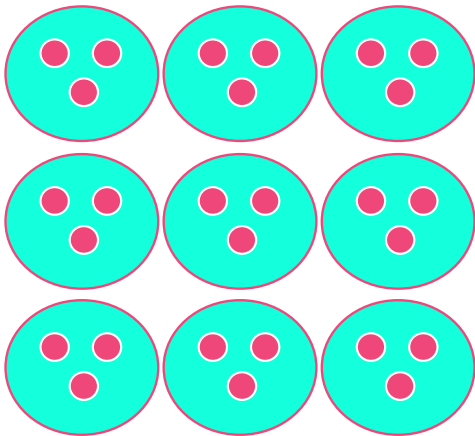
VOCABULARY

COMMUTATIVE PROPERTY

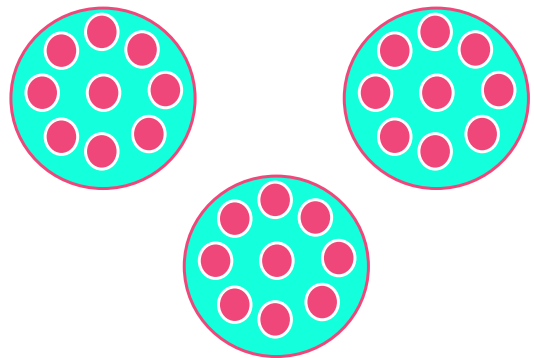
$$9 \times 3$$

=

$$3 \times 9$$

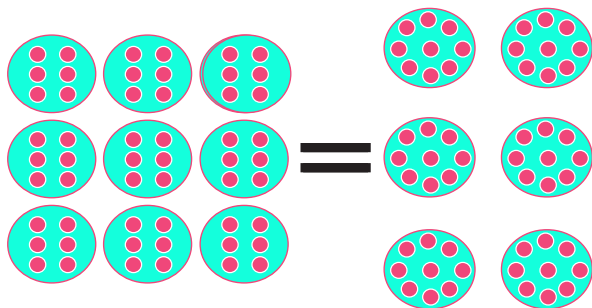


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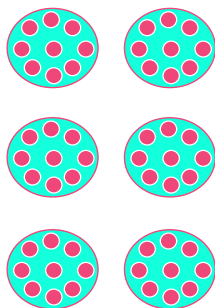


MODEL THE FACTS

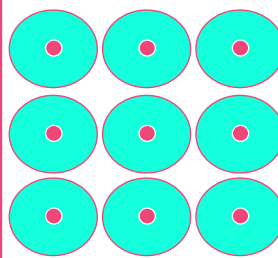
$$9 \times 6 = 6 \times 9$$



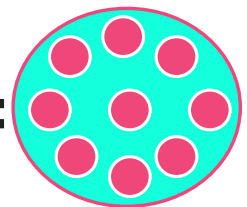
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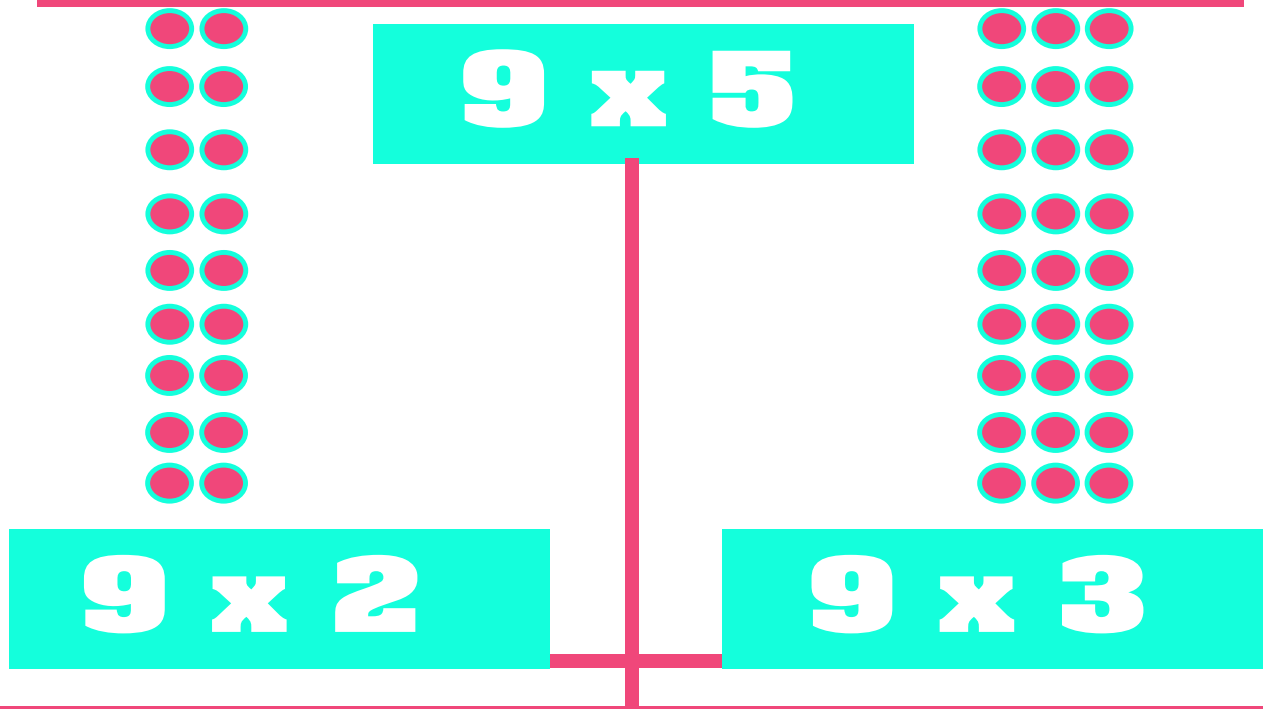
$$9 \times 1 = 1 \times 9$$



=

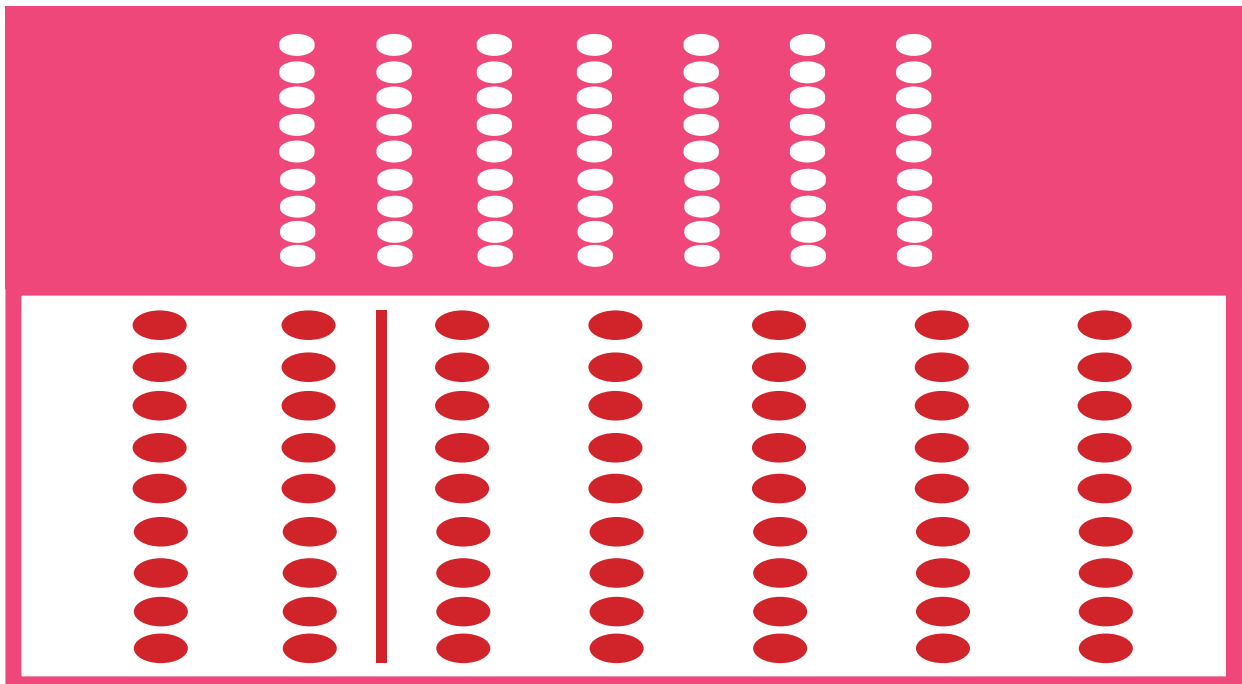


DISTRIBUTIVE PROPERTY



MODEL THE FACTS

$$9 \times 7 = (9 \times 2) + (9 \times 5)$$



There are other to ways to model this as well.

ASSOCIATIVE PROPERTY

$$9 \times 4 \times 2$$

$$9 \times 8 \text{ or } 36 \times 2$$

MORE EXAMPLES

$$9 \times 1 \times 9 = \underline{9} \times \underline{9}$$

$$9 \times 9 \times 9 = \underline{81} \times \underline{9}$$

$$9 \times 2 \times 9 = \underline{18} \times \underline{9}$$

These are examples. There are other answers.

FREE CHOICE

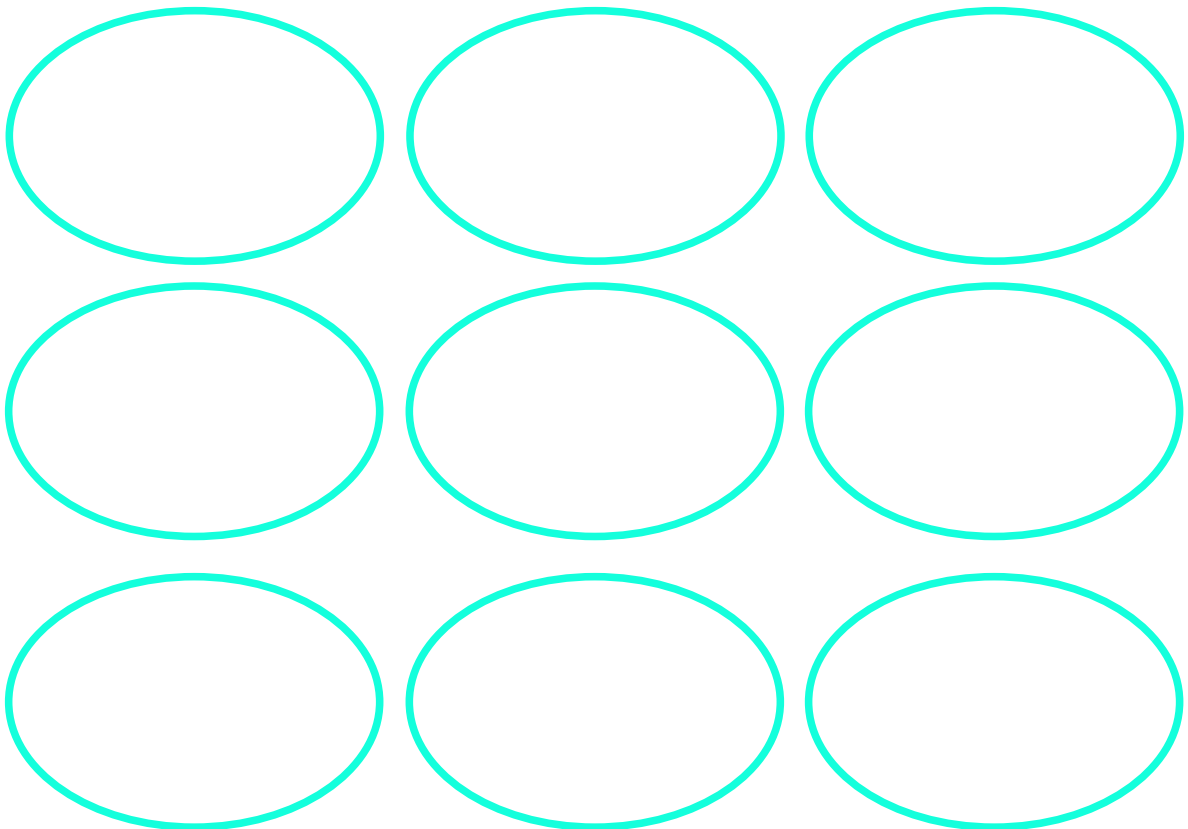
$$\underline{\quad} \times \underline{\quad} \times \underline{\quad} = \underline{\quad} \times \underline{\quad}$$

ZERO PROPERTY

When you multiply
by zero you get zero...

Zero groups of anything is zero

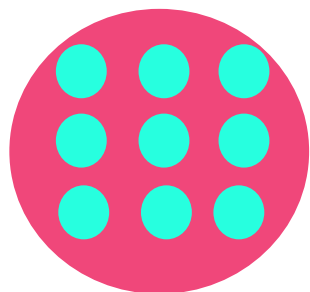
9 groups of 0 is 0



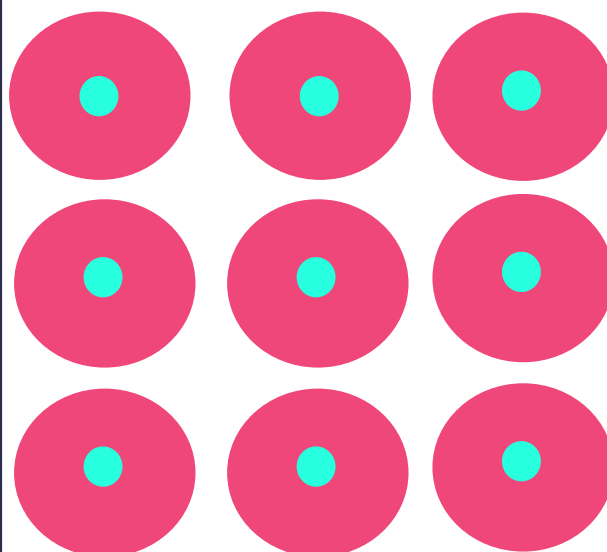
IDENTITY PROPERTY

**When you multiply by 1...
you get that number**

**1 group of
9 is 9**

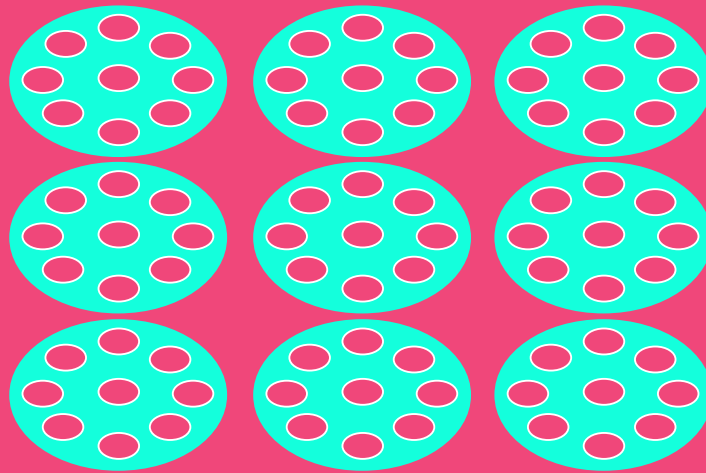


**9 groups
of 1 is 9**



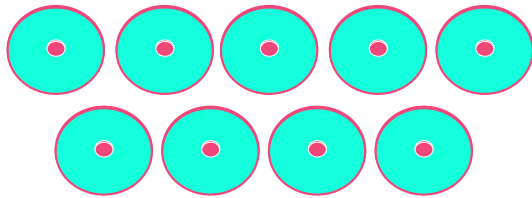
Modeling Multiplication

DRAW EQUAL GROUPS

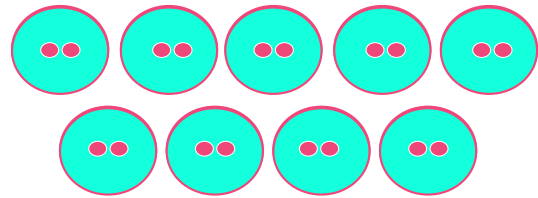


$$9 \times 9$$

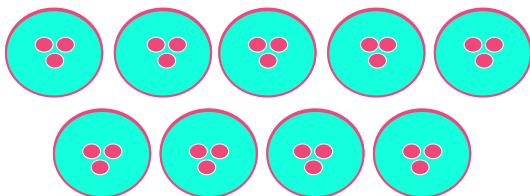
$$9 \times 1$$



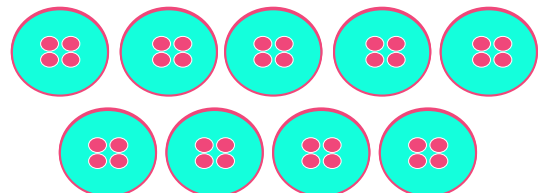
$$9 \times 2$$



$$9 \times 3$$



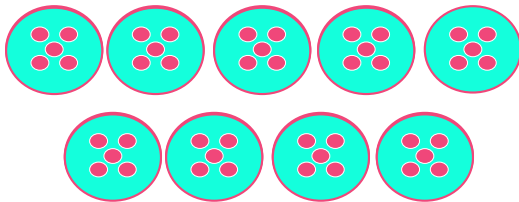
$$9 \times 4$$



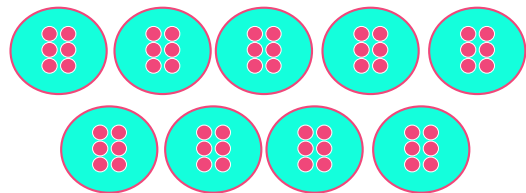
Modeling Multiplication

DRAW EQUAL GROUPS

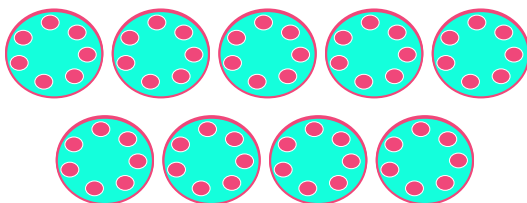
9×5



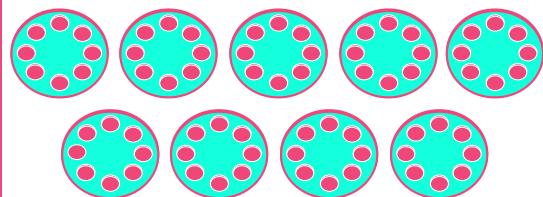
9×6



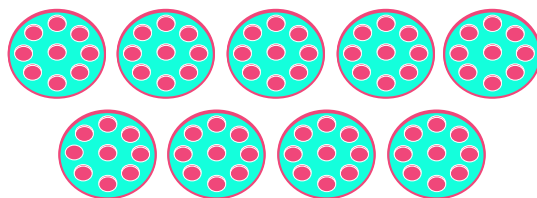
9×7



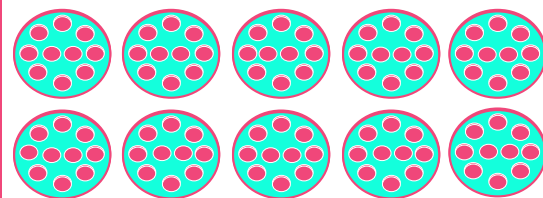
9×8



9×9



9×10



FREE CHOICE

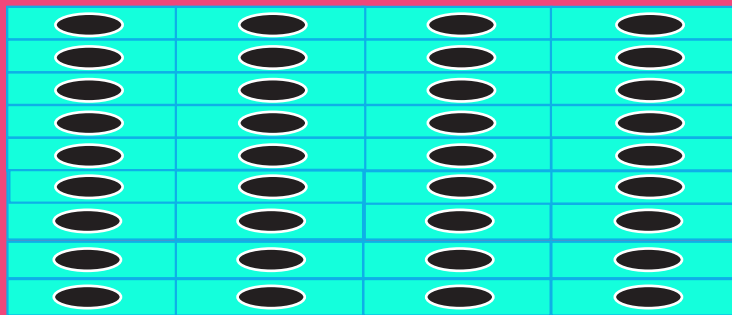
FREE CHOICE

Modeling Multiplication

DRAW AN ARRAY

9 groups of 4

$$9 \times 4 = ?$$

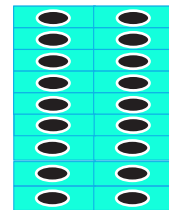


DRAW AN ARRAY

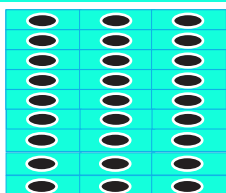
$$9 \times 1$$



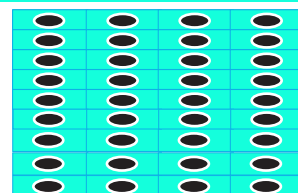
$$9 \times 2$$



$$9 \times 3$$



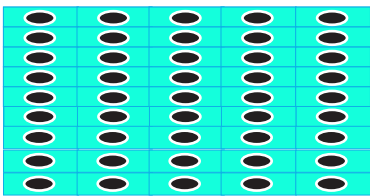
$$9 \times 4$$



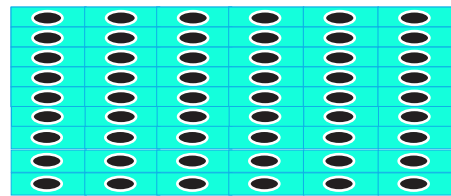
Modeling Multiplication

DRAW AN ARRAY

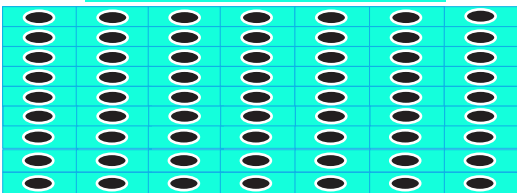
9×5



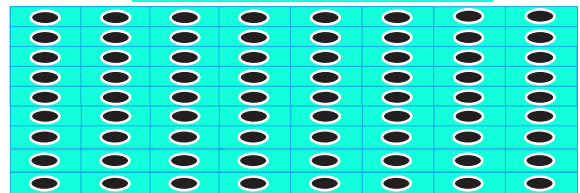
9×6



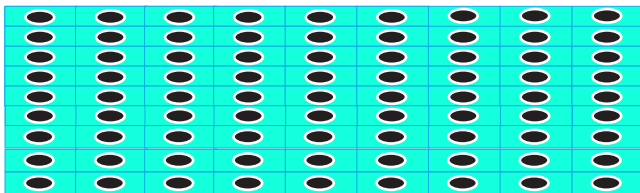
9×7



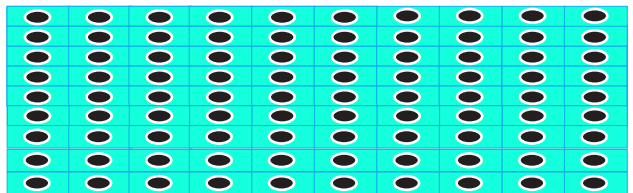
9×8



9×9



9×10



FREE CHOICE

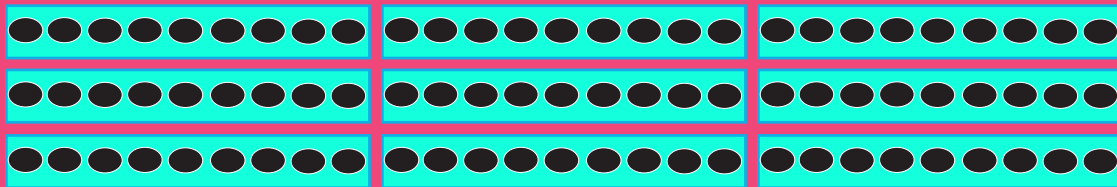
FREE CHOICE

Multiplication strategies:

REPEATED ADDITION

9 groups of 9

$$9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 = 81$$

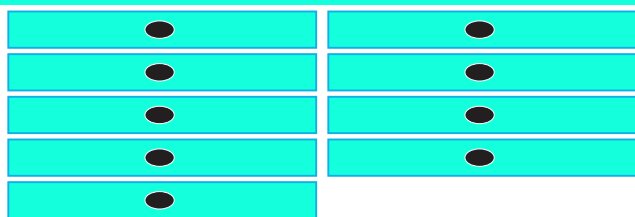


$$9 \times 9 = 81$$

MODEL THE REPEATED ADDITION SENTENCE

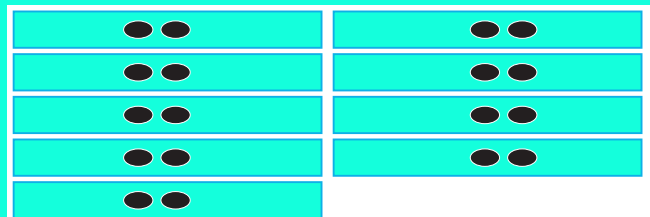
$$9 \times 1 =$$

$$1+1+1+1+1+1+1+1+1$$



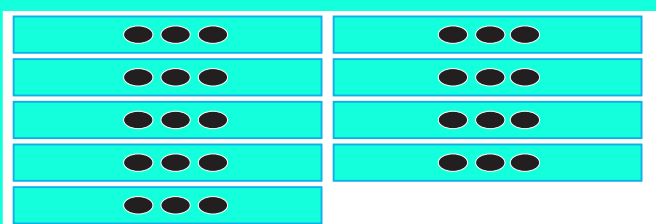
$$9 \times 2 =$$

$$2+2+2+2+2+2+2+2+2$$



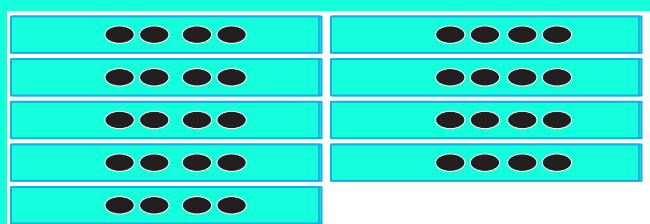
$$9 \times 3 =$$

$$3+3+3+3+3+3+3+3+3$$



$$9 \times 4 =$$

$$4+4+4+4+4+4+4+4+4$$

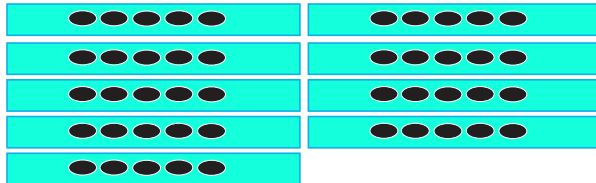


Multiplication strategies:

REPEATED ADDITION

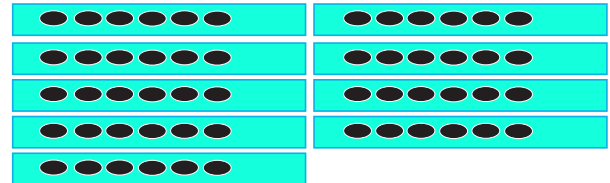
$$9 \times 5 =$$

$$5+5+5+5+5+5+5+5+5$$



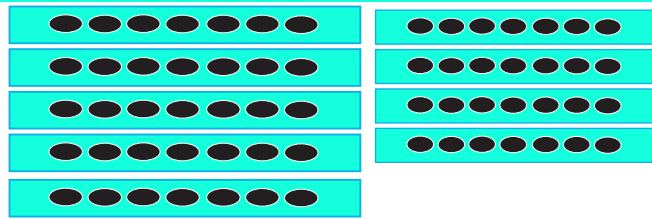
$$9 \times 6 =$$

$$6+6+6+6+6+6+6+6+6$$



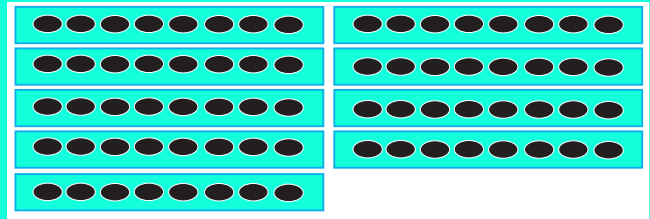
$$9 \times 7 =$$

$$7+7+7+7+7+7+7+7+7$$



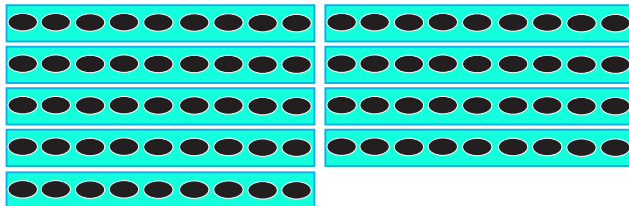
$$9 \times 8 =$$

$$8+8+8+8+8+8+8+8+8$$



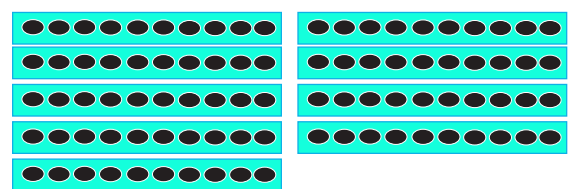
$$9 \times 9 =$$

$$9+9+9+9+9+9+9+9+9$$



$$9 \times 10 =$$

$$10+10+10+10+10+10+10+10+10$$



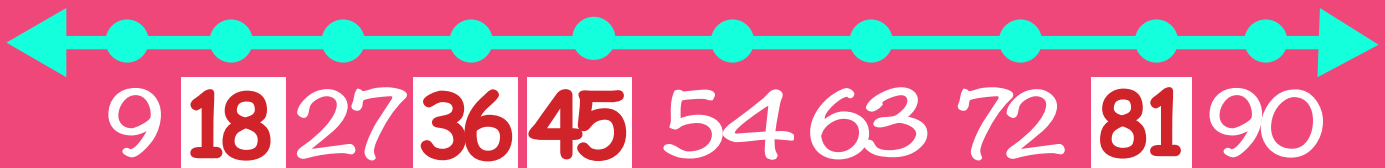
FREE CHOICE

FREE CHOICE

Modeling Multiplication

SKIP COUNTING

DRAW ON A NUMBER LINE



FILL IN THE MISSING NUMBERS



Modeling Multiplication

SKIP COUNTING

FILL IN THE MISSING NUMBERS

9	18	27	36	45	54	63	72	81	90
---	----	----	----	----	----	----	----	----	----

FILL IN THE MISSING NUMBERS

9	18	27	36	45	54	63	72	81	90
---	----	----	----	----	----	----	----	----	----

FILL IN THE MISSING NUMBERS

9	18	27	36	45	54	63	72	81	90
---	----	----	----	----	----	----	----	----	----

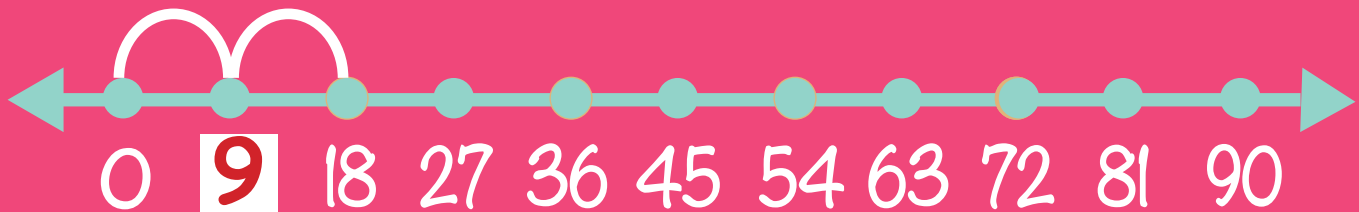
FILL IN THE MISSING NUMBERS

9	18	27	36	45	54	63	72	81	90
---	----	----	----	----	----	----	----	----	----

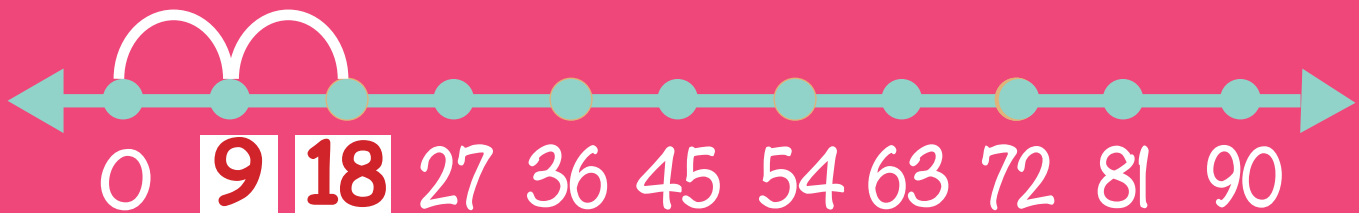
Modeling Multiplication

SKIP COUNTING

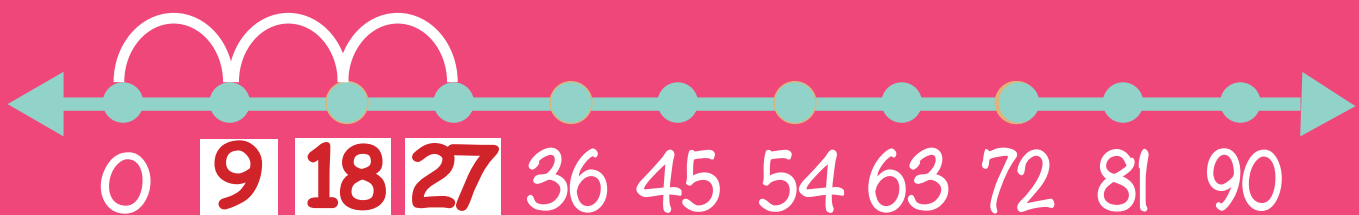
FILL IN THE MISSING NUMBERS. MODEL 9×1 ON THE NUMBER LINE.



FILL IN THE MISSING NUMBERS. MODEL 9×2 ON THE NUMBER LINE.



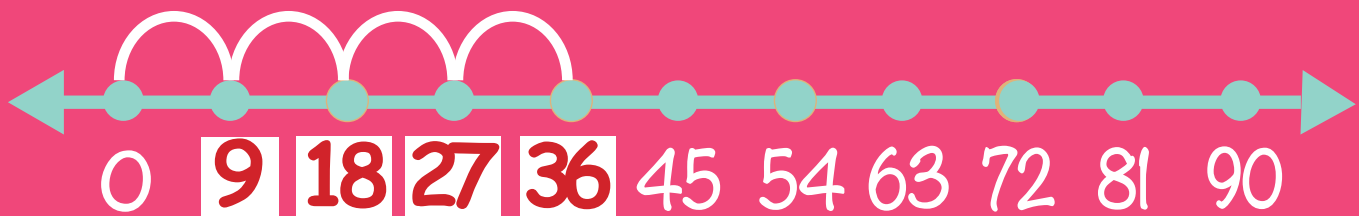
FILL IN THE MISSING NUMBERS. MODEL 9×3 ON THE NUMBER LINE.



Modeling Multiplication

SKIP COUNTING

FILL IN THE MISSING NUMBERS. MODEL 9×4 ON THE NUMBER LINE.



FILL IN THE MISSING NUMBERS. MODEL 9×5 ON THE NUMBER LINE.



FILL IN THE MISSING NUMBERS. MODEL 9×6 ON THE NUMBER LINE.



FILL IN THE MISSING NUMBERS. MODEL 9×7 ON THE NUMBER LINE.



Modeling Multiplication

SKIP COUNTING

FILL IN THE MISSING NUMBERS. MODEL 9×8 ON THE NUMBER LINE.



FILL IN THE MISSING NUMBERS. MODEL 9×9 ON THE NUMBER LINE.



FILL IN THE MISSING NUMBERS. MODEL 9×10 ON THE NUMBER LINE.



Multiplication strategies:

SKIP COUNTING ON THE NUMBER LINE



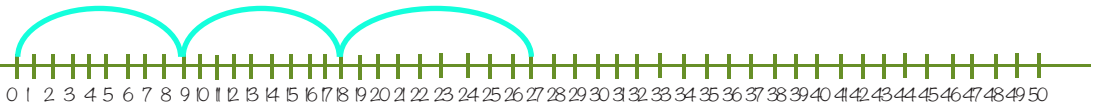
$$9 \times 2$$

SOLVE THE PROBLEM ON THE NUMBER LINE

$$9 \times 2$$



$$9 \times 3$$



$$9 \times 4$$

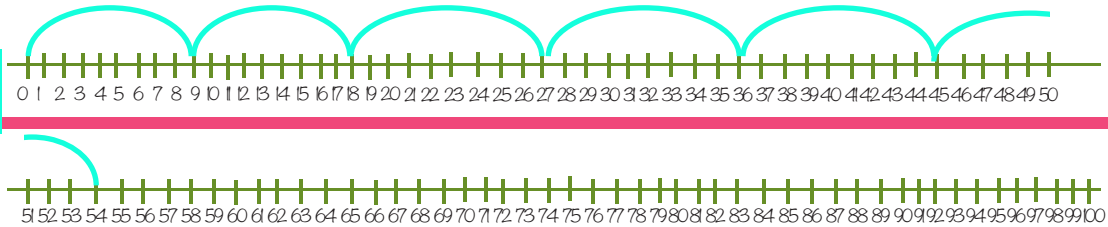


$$9 \times 5$$

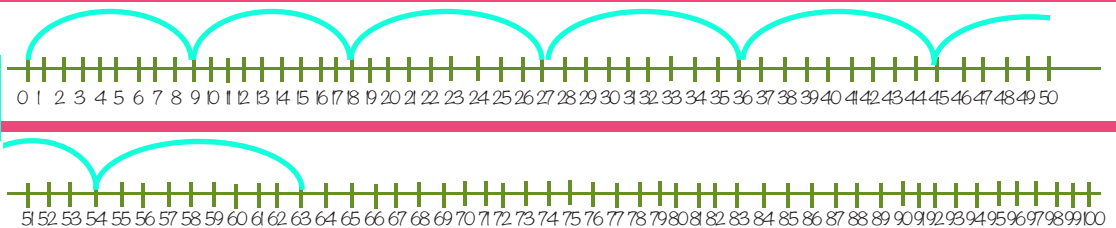


SOLVE THE PROBLEM ON THE NUMBER LINE

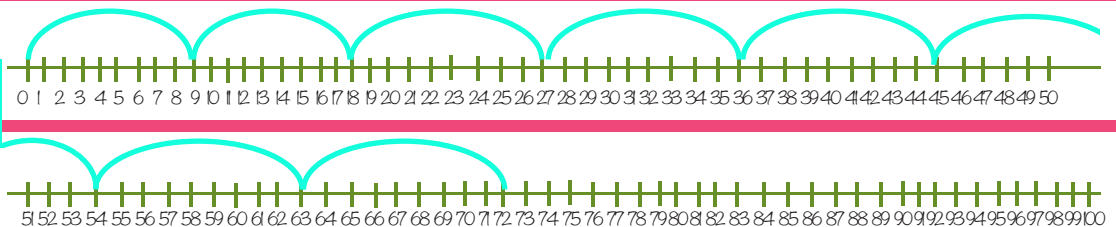
9×6



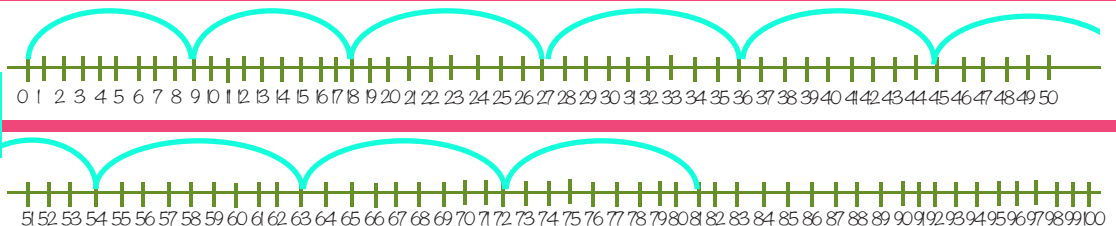
9×7



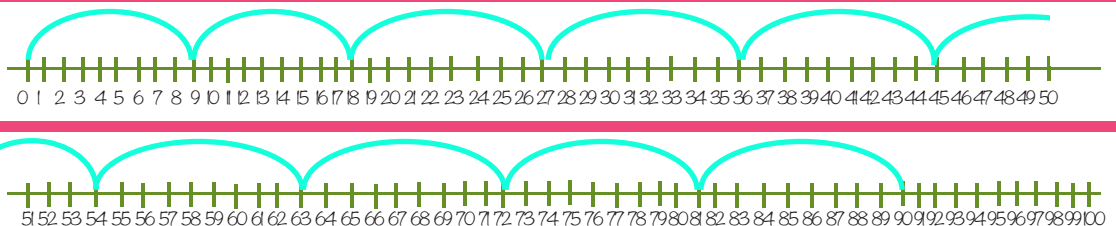
9×8



9×9



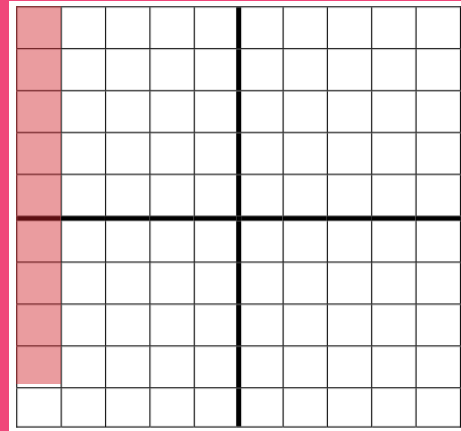
9×10



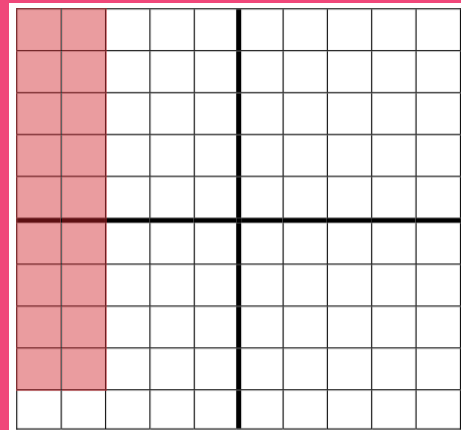
Array Flashcards

MODEL THE PROBLEMS ON THE GRIDS.

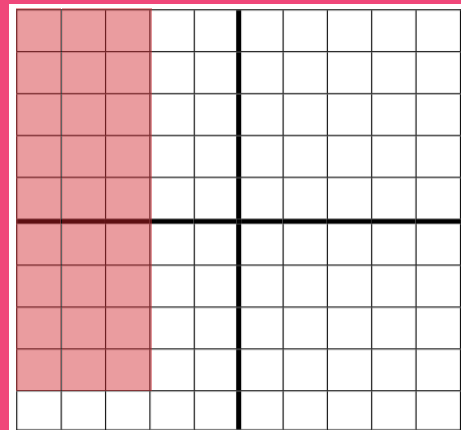
$$9 \times 1 = \underline{9}$$



$$9 \times 2 = \underline{18}$$



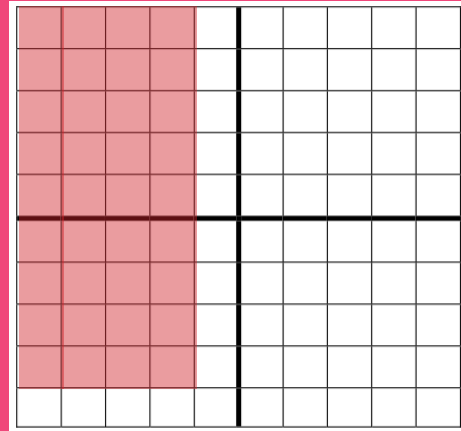
$$9 \times 3 = \underline{27}$$



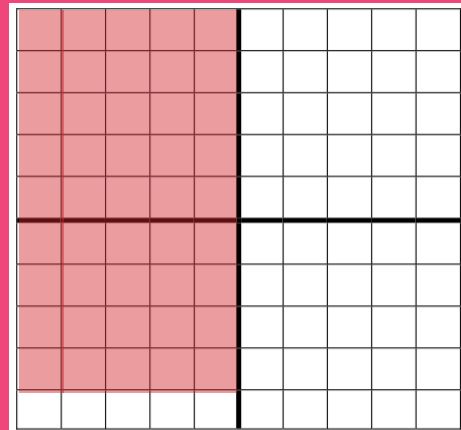
Array Flashcards

MODEL THE PROBLEMS ON THE GRIDS.

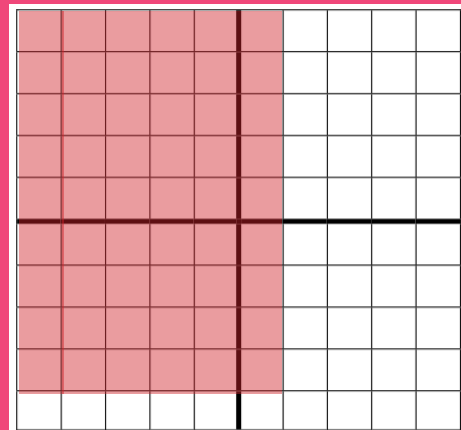
$$9 \times 4 = \underline{36}$$



$$9 \times 5 = \underline{45}$$



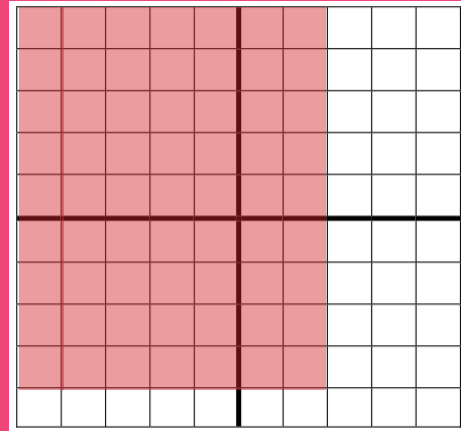
$$9 \times 6 = \underline{54}$$



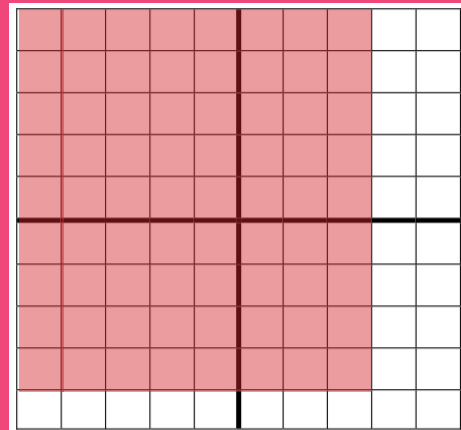
Array Flashcards

MODEL THE PROBLEMS ON THE GRIDS.

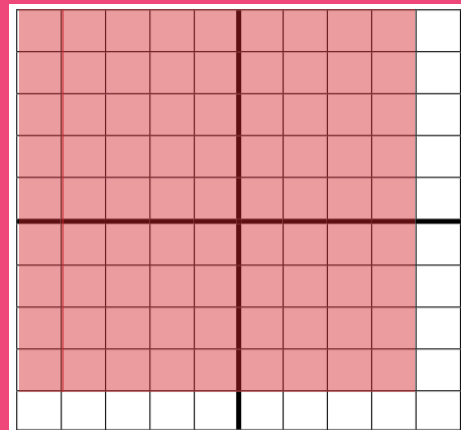
$$9 \times 7 = \underline{63}$$



$$9 \times 8 = \underline{72}$$



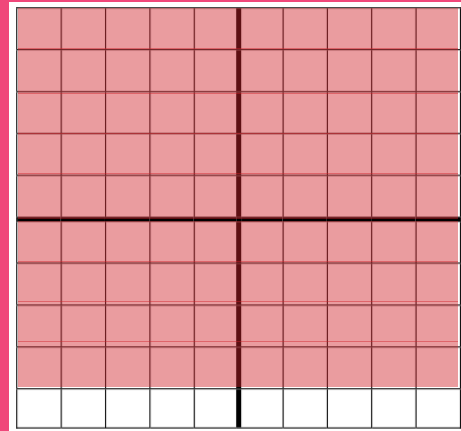
$$9 \times 9 = \underline{81}$$



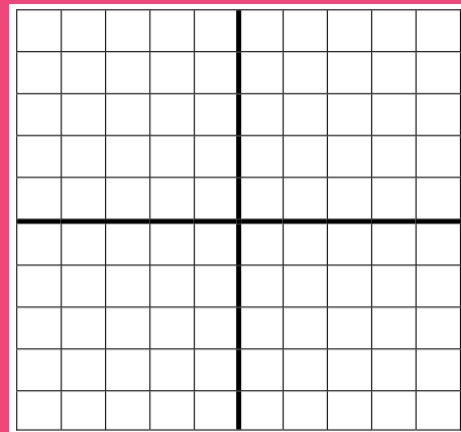
Array Flashcards

MODEL THE PROBLEMS ON THE GRIDS.

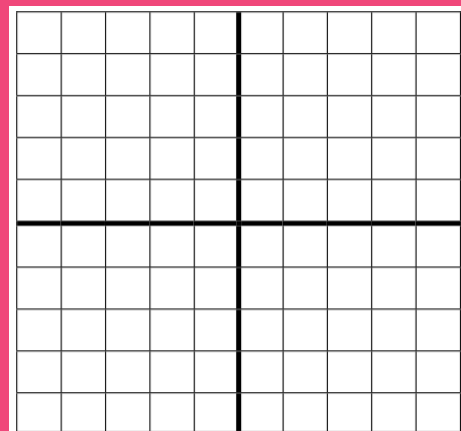
$$9 \times 10 = \underline{90}$$



FREE CHOICE



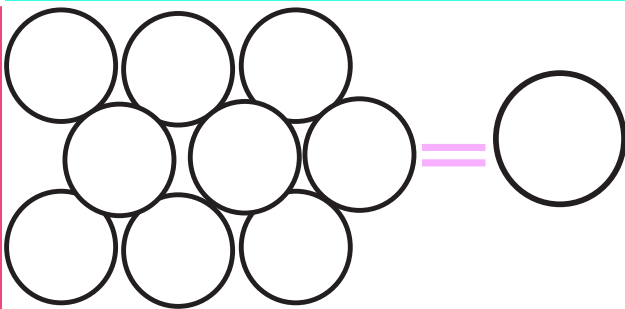
FREE CHOICE



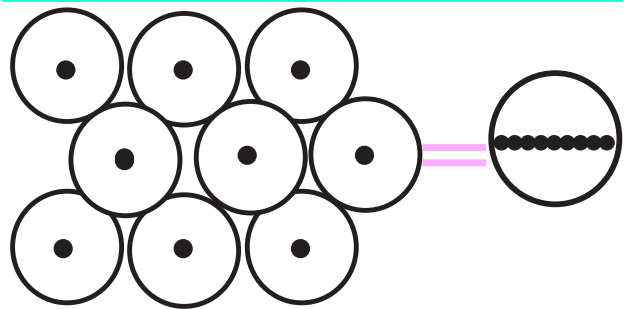
Equal Group Flashcards

MAKE YOUR OWN EQUAL GROUP FLASHCARDS. DRAW EQUAL GROUPS TO MODEL THE PROBLEM.

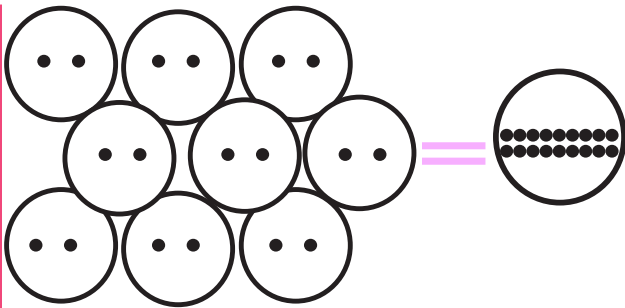
$$9 \times 0 = 0$$



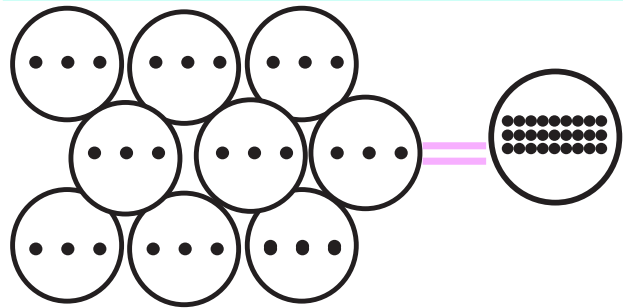
$$9 \times 1 = 9$$



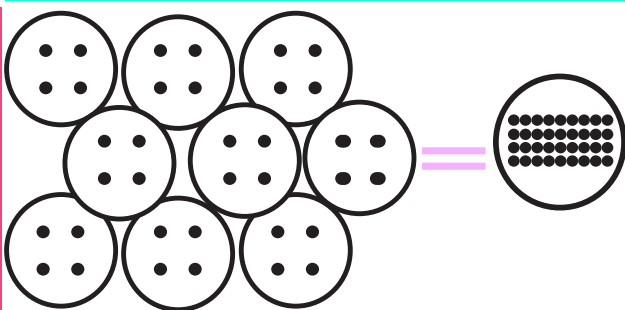
$$9 \times 2 = 18$$



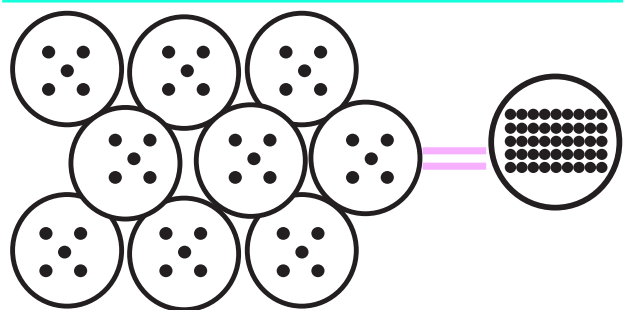
$$9 \times 3 = 27$$



$$9 \times 4 = 36$$



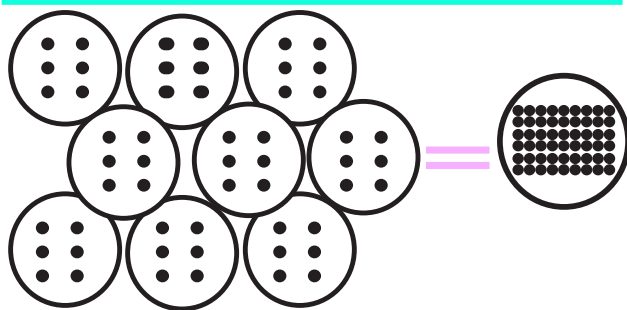
$$9 \times 5 = 45$$



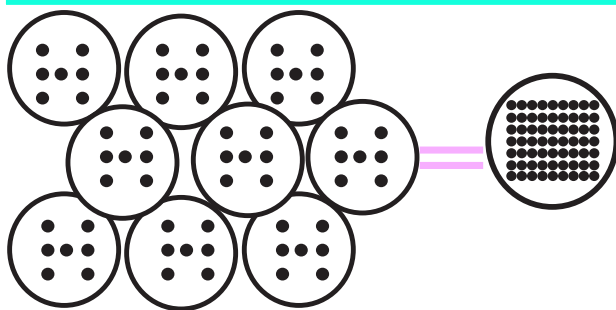
Equal Group Flashcards

MAKE YOUR OWN EQUAL GROUP FLASHCARDS. DRAW EQUAL GROUPS TO MODEL THE PROBLEM.

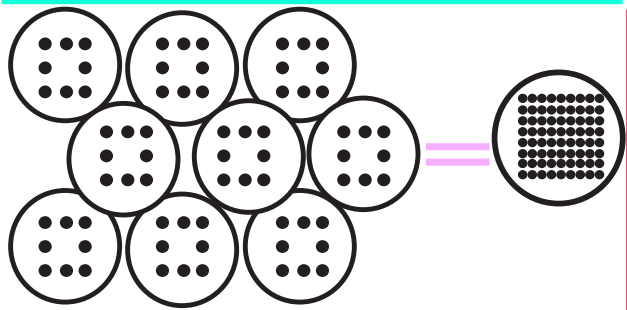
$$9 \times 6 = 54$$



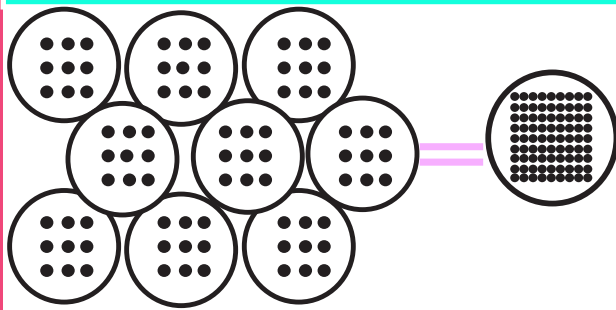
$$9 \times 7 = 63$$



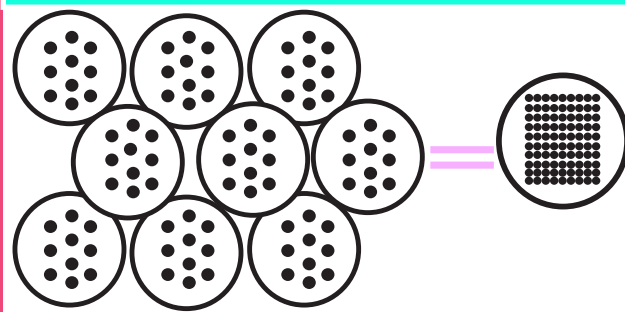
$$9 \times 8 = 72$$



$$9 \times 9 = 81$$



$$9 \times 10 = 90$$



Regular Flashcards

$$9 \times 0$$

$$9 \times 1$$

$$9 \times 2$$

$$9 \times 3$$

$$9 \times 4$$

$$9 \times 5$$

Regular Flashcards

$$9 \times 6$$

$$9 \times 7$$

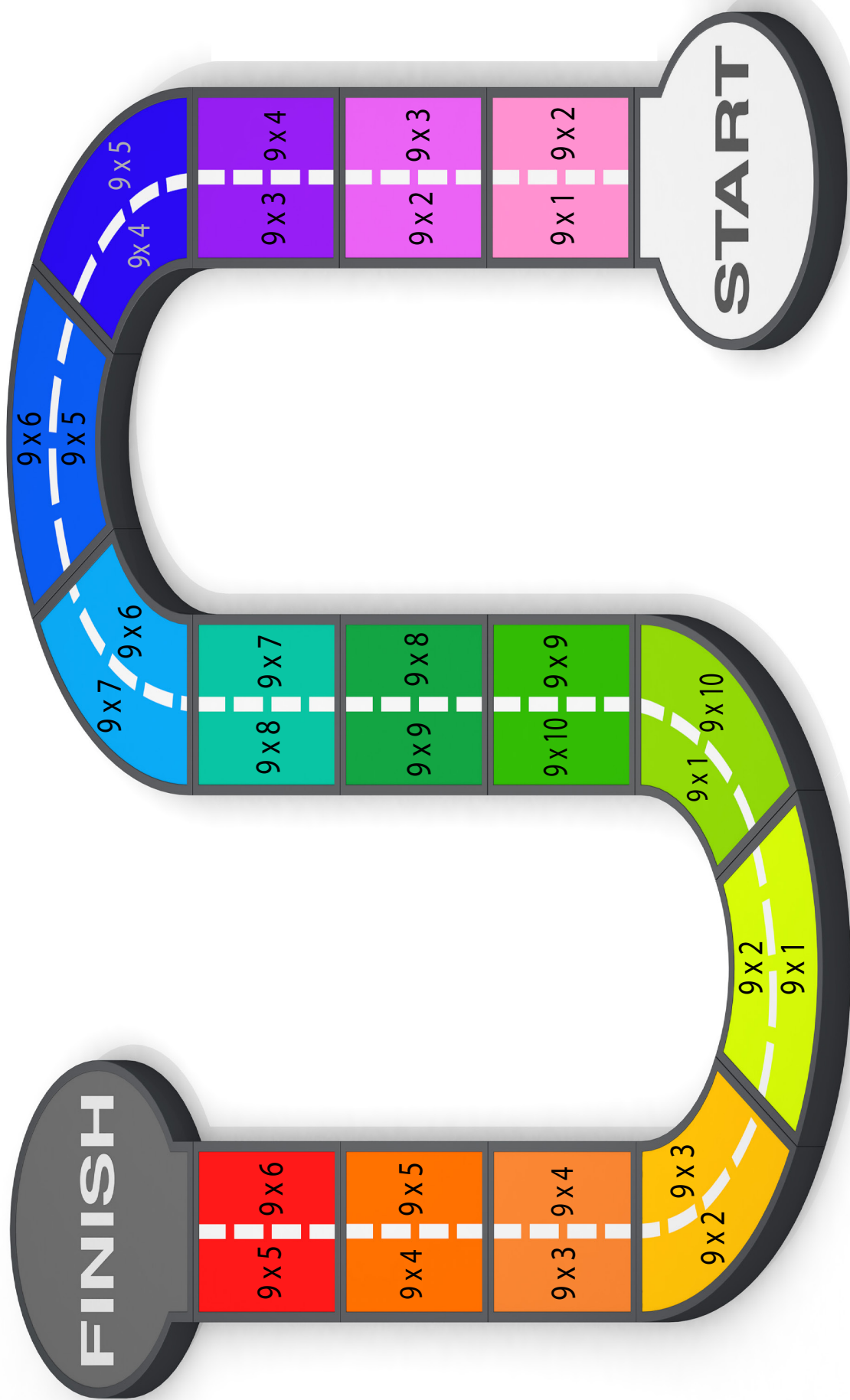
$$9 \times 8$$

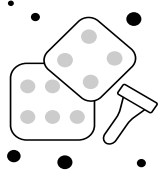
$$9 \times 9$$

$$9 \times 10$$

MULTIPLICATION RACE

Directions: Play with a partner. Each player chooses a marker and a side. Decide who starts. Roll the die. Take turns moving. Player 1 says the product. Player 2 checks the answer using the bookmark. If it is correct, stay on the spot. If it is incorrect, move back one. Whoever reaches first wins.

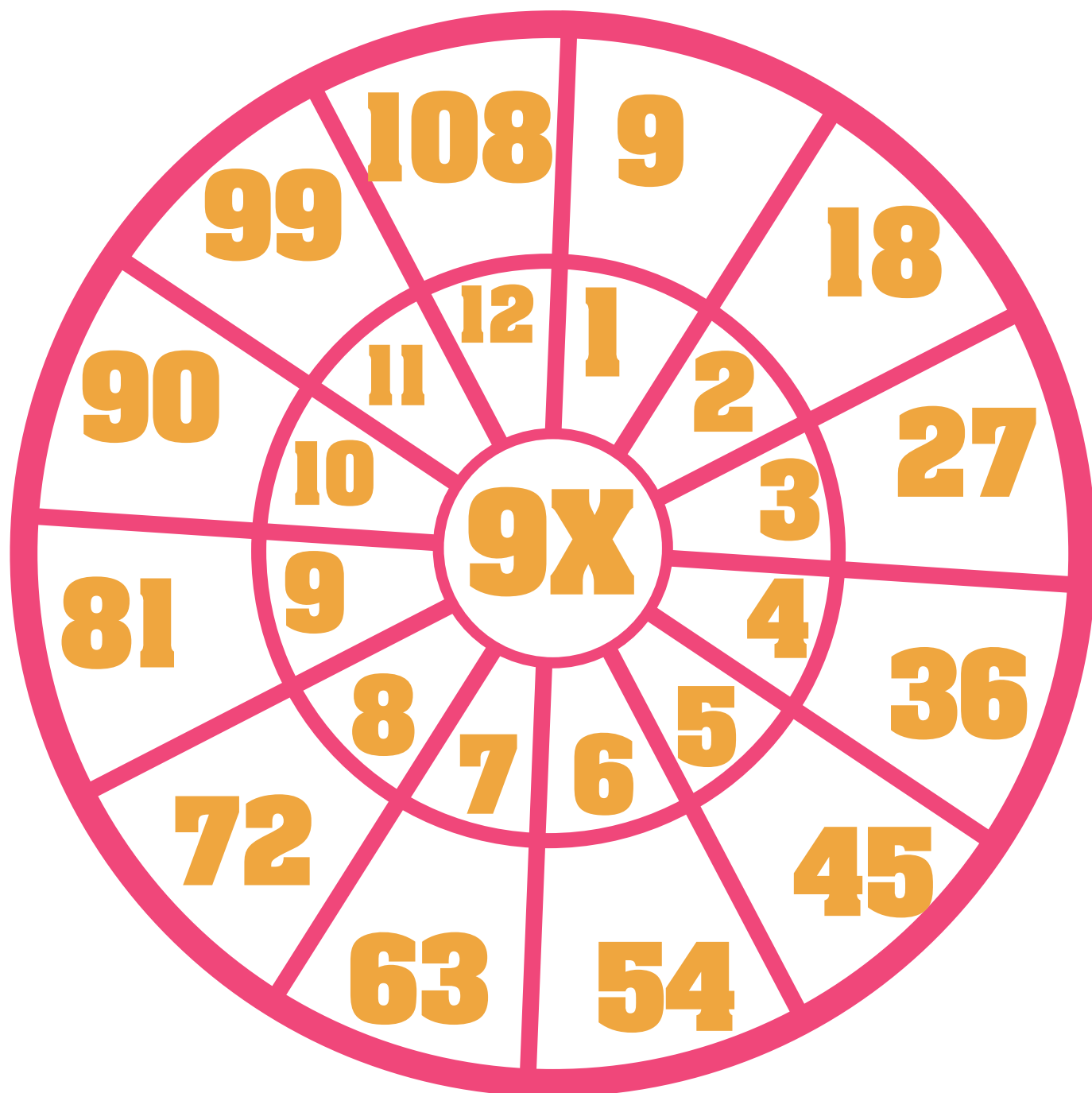




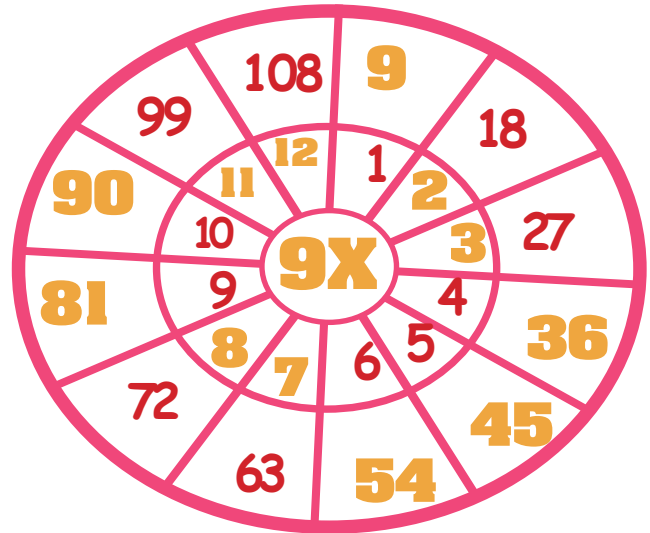
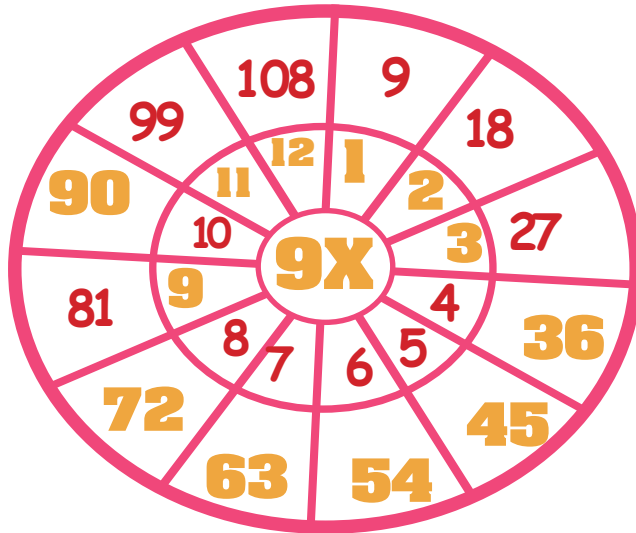
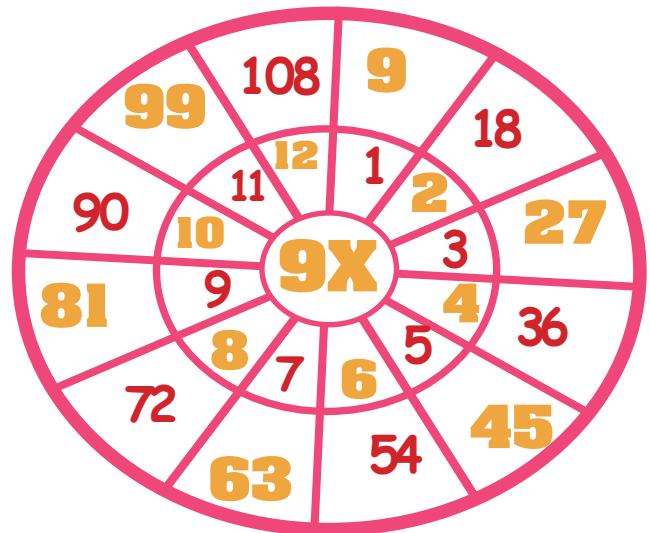
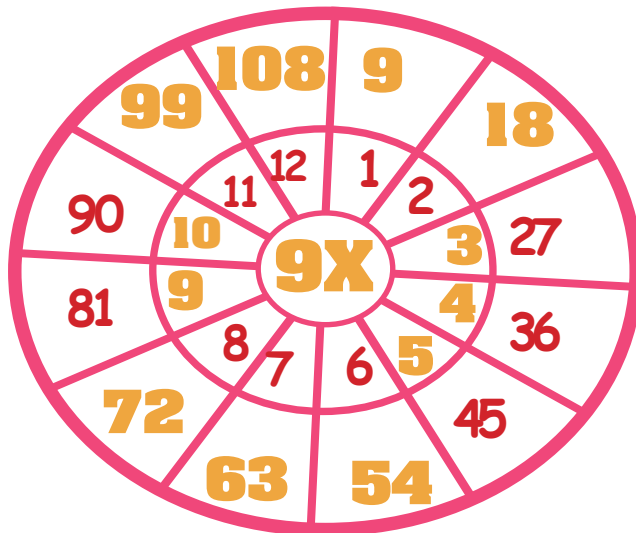
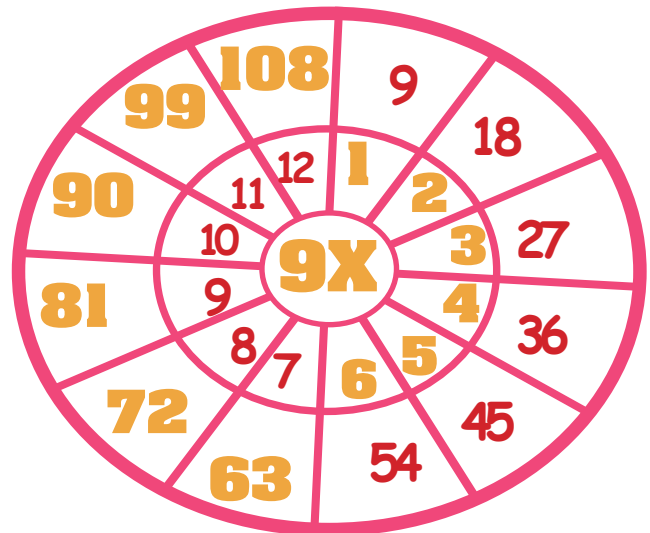
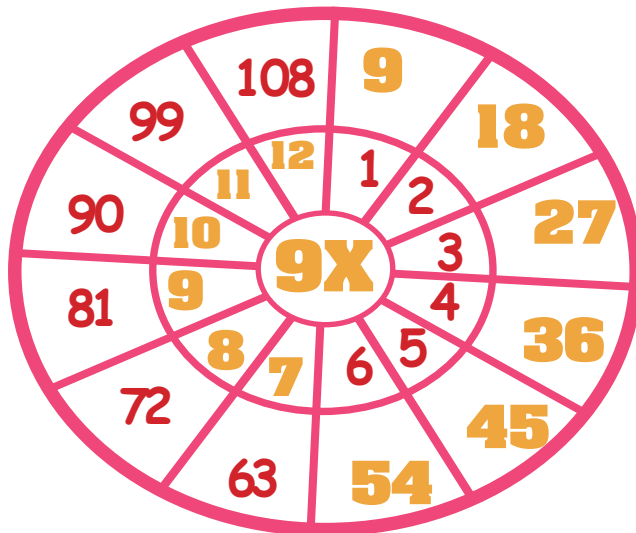
BALLOON RACE



MULTIPLICATION WHEELS



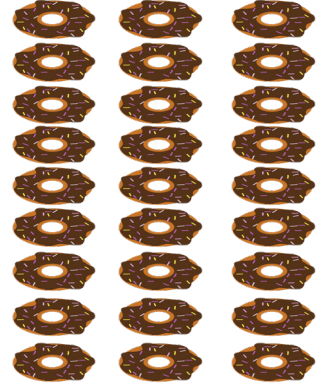
MULTIPLICATION WHEELS



PICTURE FACT FAMILY



$$\begin{array}{r} 9 \\ \hline 2 \\ \hline 18 \\ \hline 18 \end{array} \begin{array}{c} \times \\ \times \\ \div \\ \div \end{array} \begin{array}{r} 2 \\ \hline 9 \\ \hline 9 \\ \hline 2 \end{array} = \begin{array}{r} 18 \\ \hline 18 \\ \hline 2 \\ \hline 9 \end{array}$$



$$\begin{array}{r} 9 \\ \hline 3 \\ \hline 27 \\ \hline 27 \end{array} \begin{array}{c} \times \\ \times \\ \div \\ \div \end{array} \begin{array}{r} 3 \\ \hline 9 \\ \hline 3 \\ \hline 9 \end{array} = \begin{array}{r} 27 \\ \hline 27 \\ \hline 9 \\ \hline 3 \end{array}$$

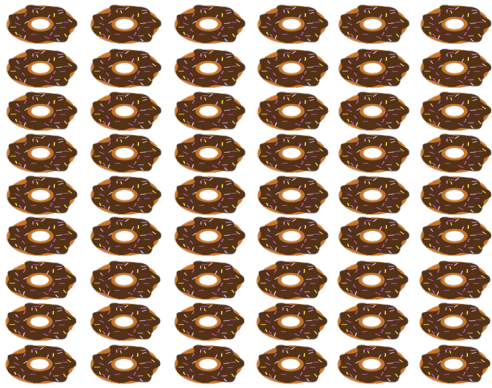


$$\begin{array}{r} 9 \\ \hline 4 \\ \hline 36 \\ \hline 36 \end{array} \begin{array}{c} \times \\ \times \\ \div \\ \div \end{array} \begin{array}{r} 4 \\ \hline 9 \\ \hline 4 \\ \hline 9 \end{array} = \begin{array}{r} 36 \\ \hline 36 \\ \hline 9 \\ \hline 4 \end{array}$$

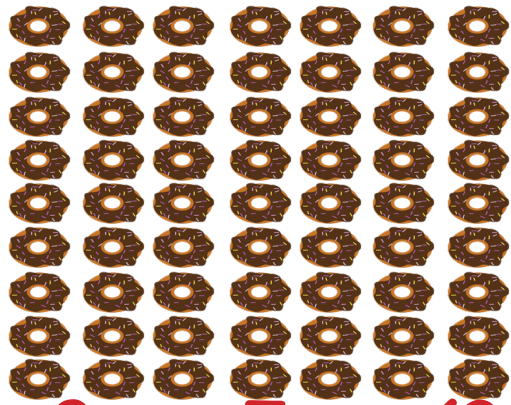


$$\begin{array}{r} 9 \\ \hline 5 \\ \hline 45 \\ \hline 45 \end{array} \begin{array}{c} \times \\ \times \\ \div \\ \div \end{array} \begin{array}{r} 5 \\ \hline 9 \\ \hline 5 \\ \hline 9 \end{array} = \begin{array}{r} 45 \\ \hline 45 \\ \hline 9 \\ \hline 5 \end{array}$$

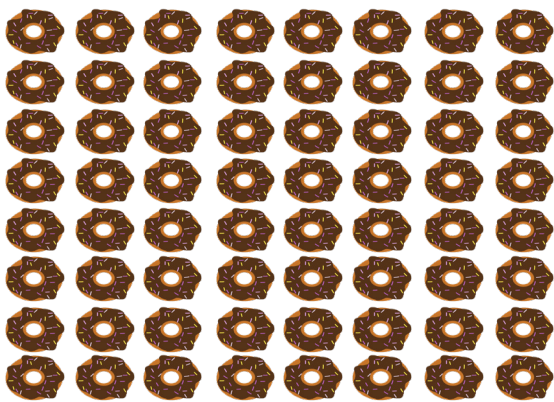
PICTURE FACT FAMILY



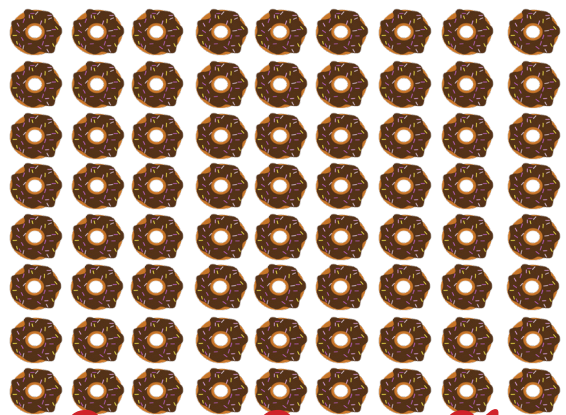
$$\begin{array}{r} 9 \times 6 = 54 \\ 6 \times 9 = 54 \\ 54 \div 6 = 9 \\ 54 \div 9 = 6 \end{array}$$



$$\begin{array}{r} 9 \times 7 = 63 \\ 7 \times 9 = 63 \\ 63 \div 7 = 9 \\ 63 \div 9 = 7 \end{array}$$

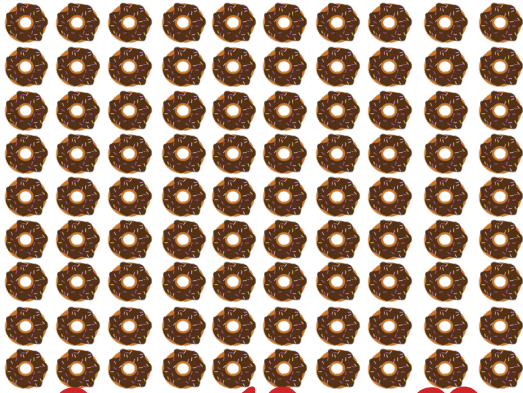


$$\begin{array}{r} 9 \times 8 = 72 \\ 8 \times 9 = 72 \\ 72 \div 8 = 9 \\ 72 \div 9 = 8 \end{array}$$



$$\begin{array}{r} 9 \times 9 = 81 \\ 9 \times 9 = 81 \\ 81 \div 9 = 9 \\ 81 \div 9 = 9 \end{array}$$

PICTURE FACT FAMILY



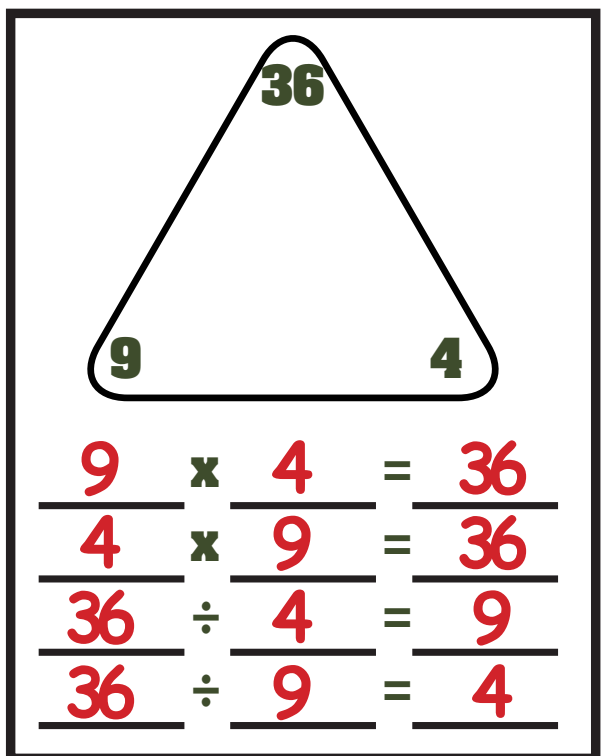
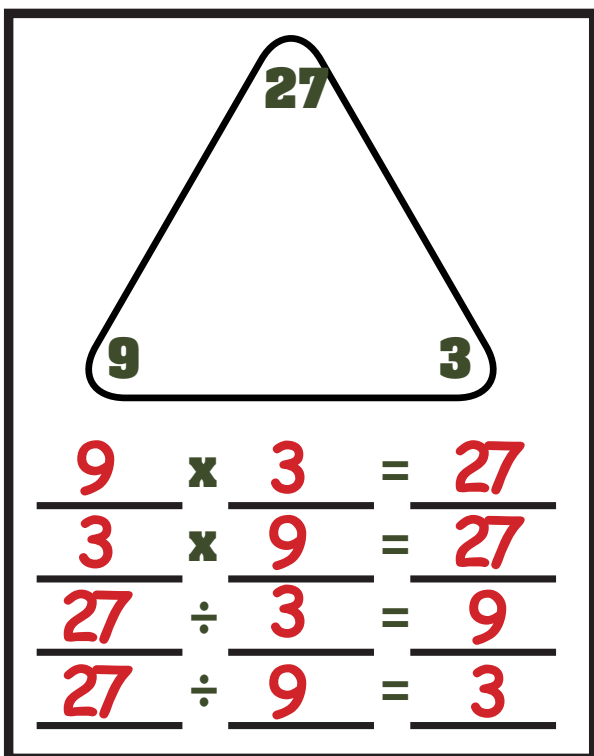
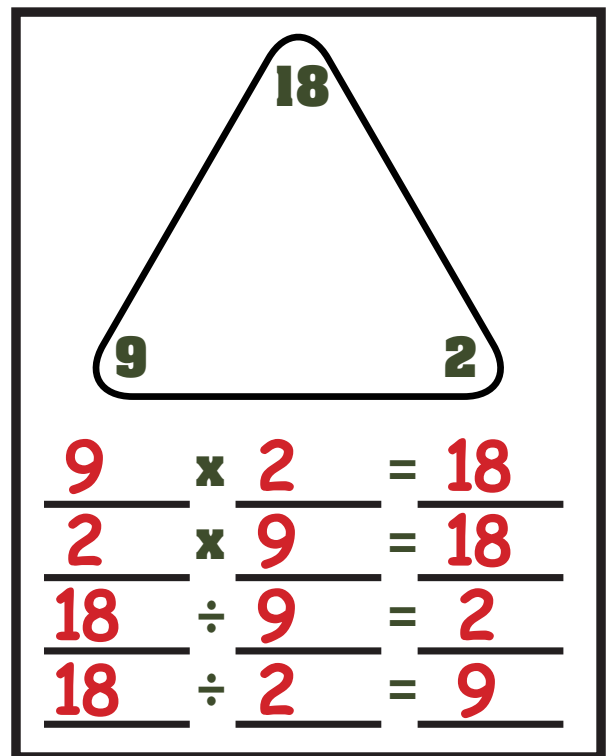
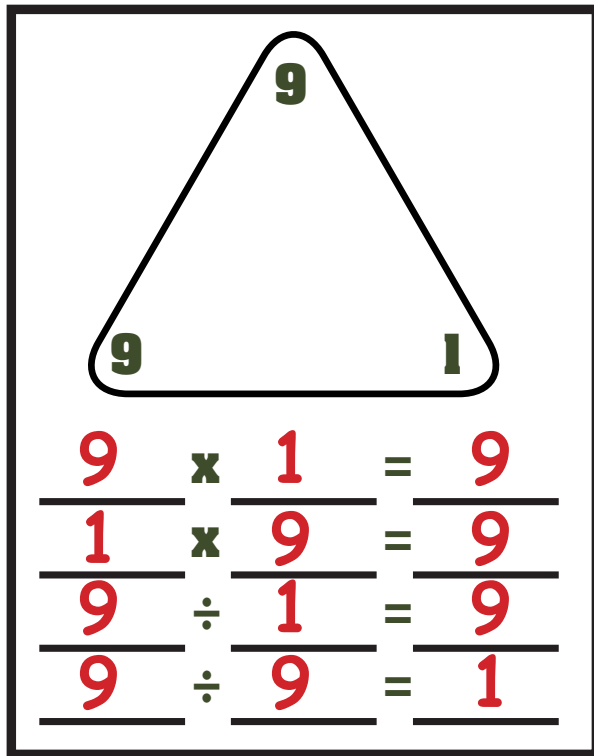
A 9x10 grid of donuts, with 9 rows and 10 columns, totaling 90 donuts. Below the grid are four math facts for the 9 and 10 multiplication and division family.

$$\begin{array}{r} 9 \\ \hline \end{array} \times \begin{array}{r} 10 \\ \hline \end{array} = \begin{array}{r} 90 \\ \hline \end{array}$$
$$\begin{array}{r} 10 \\ \hline \end{array} \times \begin{array}{r} 9 \\ \hline \end{array} = \begin{array}{r} 90 \\ \hline \end{array}$$
$$\begin{array}{r} 90 \\ \hline \end{array} \div \begin{array}{r} 10 \\ \hline \end{array} = \begin{array}{r} 9 \\ \hline \end{array}$$
$$\begin{array}{r} 90 \\ \hline \end{array} \div \begin{array}{r} 9 \\ \hline \end{array} = \begin{array}{r} 10 \\ \hline \end{array}$$

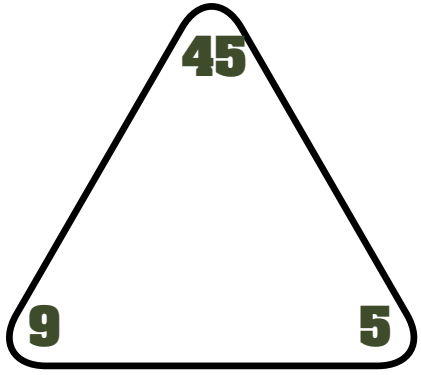
MAKE YOUR OWN

	x		=	
	x		=	
	÷		=	
	÷		=	

TRIANGLE FACT FAMILY



TRIANGLE FACT FAMILY

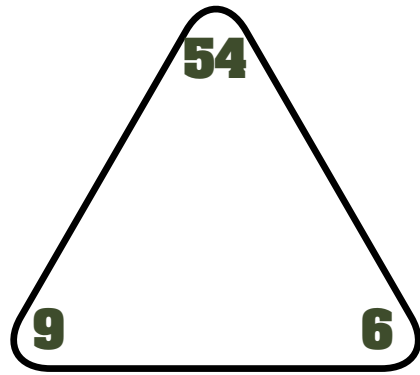


9 x 5 = 45

5 x 9 = 45

45 ÷ 5 = 9

45 ÷ 9 = 5

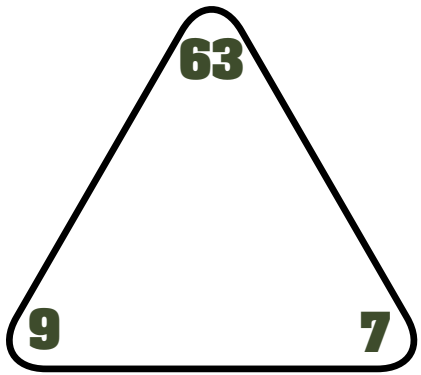


9 x 6 = 54

6 x 9 = 54

54 ÷ 6 = 9

54 ÷ 9 = 6

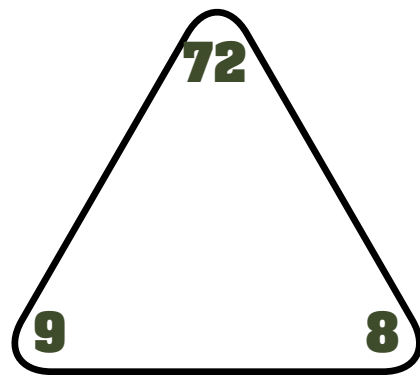


9 x 7 = 63

7 x 9 = 63

63 ÷ 7 = 9

63 ÷ 9 = 7



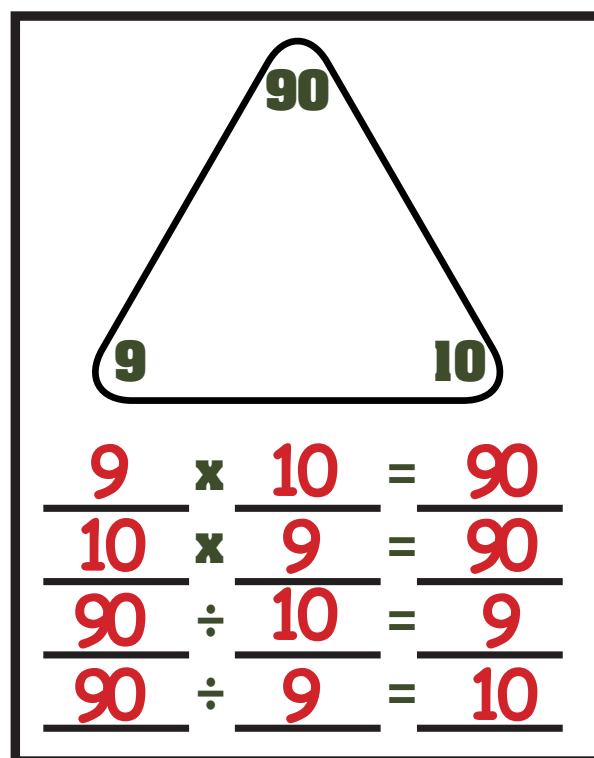
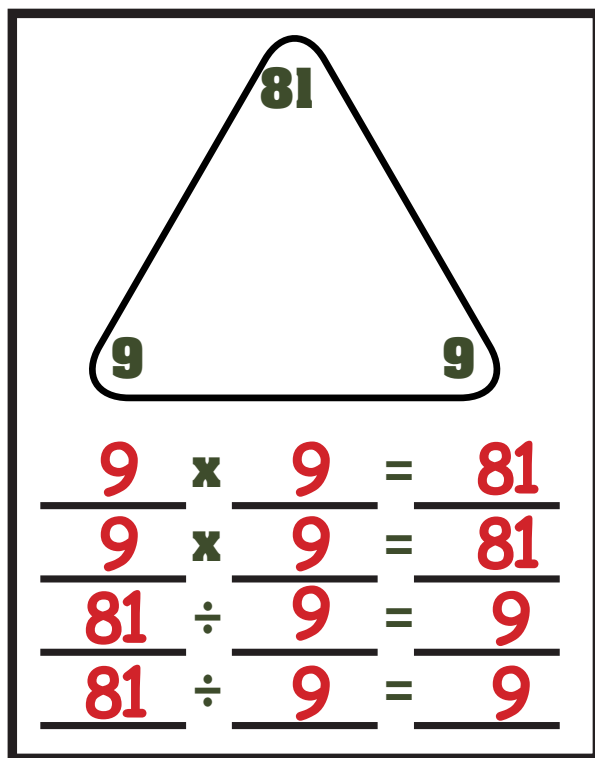
9 x 8 = 72

8 x 9 = 72

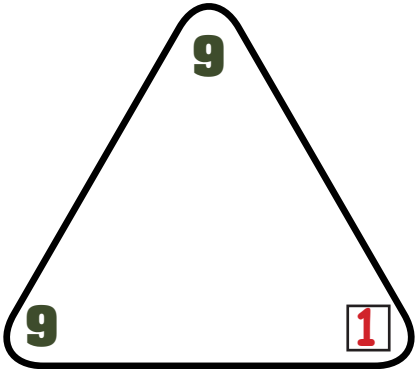
72 ÷ 8 = 9

72 ÷ 9 = 8

TRIANGLE FACT FAMILY



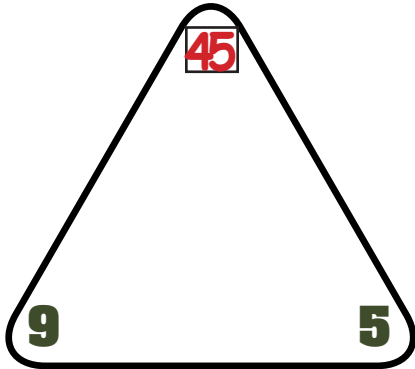
TRIANGLE FACT FAMILY



9

9

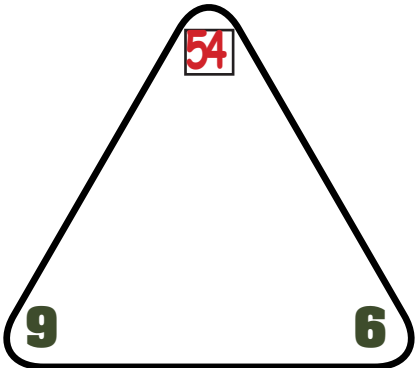
1

$$\begin{array}{r} 9 \times 1 = 9 \\ 1 \times 9 = 9 \\ 9 \div 1 = 9 \\ 9 \div 9 = 1 \end{array}$$


45

9

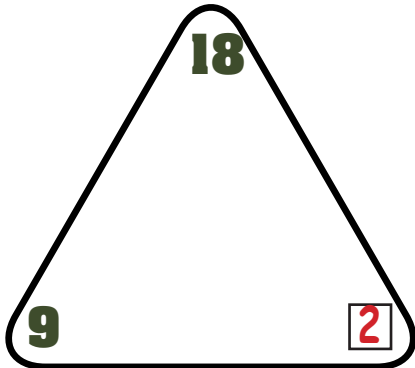
5

$$\begin{array}{r} 9 \times 5 = 45 \\ 5 \times 9 = 45 \\ 45 \div 5 = 9 \\ 45 \div 9 = 5 \end{array}$$


54

9

6

$$\begin{array}{r} 9 \times 6 = 54 \\ 6 \times 9 = 54 \\ 54 \div 6 = 9 \\ 54 \div 9 = 6 \end{array}$$


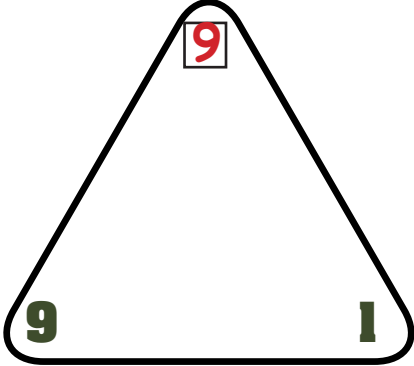
18

9

2

$$\begin{array}{r} 9 \times 2 = 18 \\ 2 \times 9 = 18 \\ 18 \div 9 = 2 \\ 18 \div 2 = 9 \end{array}$$

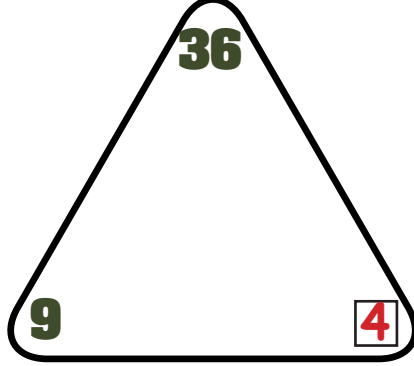
TRIANGLE FACT FAMILY



$$\begin{array}{r} 9 \\ \hline 1 \end{array} \times \begin{array}{r} 1 \\ \hline 9 \end{array} = \begin{array}{r} 9 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 1 \\ \hline 9 \end{array} \times \begin{array}{r} 9 \\ \hline 1 \end{array} = \begin{array}{r} 9 \\ \hline 9 \end{array}$$

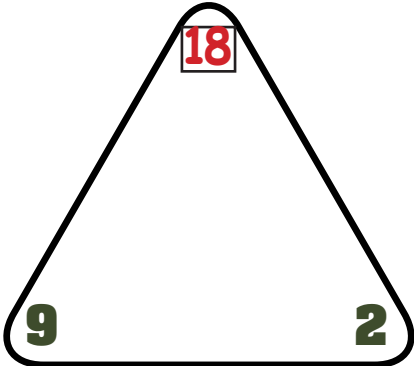
$$\begin{array}{r} 9 \\ \hline 9 \end{array} \div \begin{array}{r} 1 \\ \hline 9 \end{array} = \begin{array}{r} 9 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 9 \\ \hline 9 \end{array} \div \begin{array}{r} 9 \\ \hline 9 \end{array} = \begin{array}{r} 9 \\ \hline 1 \end{array}$$


$$\begin{array}{r} 9 \\ \hline 4 \end{array} \times \begin{array}{r} 4 \\ \hline 9 \end{array} = \begin{array}{r} 36 \\ \hline 36 \end{array}$$

$$\begin{array}{r} 4 \\ \hline 9 \end{array} \times \begin{array}{r} 9 \\ \hline 4 \end{array} = \begin{array}{r} 36 \\ \hline 36 \end{array}$$

$$\begin{array}{r} 36 \\ \hline 36 \end{array} \div \begin{array}{r} 4 \\ \hline 9 \end{array} = \begin{array}{r} 9 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 36 \\ \hline 36 \end{array} \div \begin{array}{r} 9 \\ \hline 4 \end{array} = \begin{array}{r} 9 \\ \hline 4 \end{array}$$


$$\begin{array}{r} 9 \\ \hline 2 \end{array} \times \begin{array}{r} 2 \\ \hline 9 \end{array} = \begin{array}{r} 18 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 2 \\ \hline 9 \end{array} \times \begin{array}{r} 9 \\ \hline 2 \end{array} = \begin{array}{r} 18 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 18 \\ \hline 18 \end{array} \div \begin{array}{r} 9 \\ \hline 2 \end{array} = \begin{array}{r} 2 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 18 \\ \hline 18 \end{array} \div \begin{array}{r} 2 \\ \hline 9 \end{array} = \begin{array}{r} 2 \\ \hline 9 \end{array}$$

WORD PROBLEM

MODEL YOUR THINKING AND SOLVE THE PROBLEM

THE BAKERY HAD 9 ROWS OF DONUTS. THERE WERE 6 DONUTS IN EACH ROW. HOW MANY DONUTS DID THEY HAVE ALTOGETHER?

$$\underline{9} \times \underline{6} = \underline{54}$$

THE BAKERY HAD 9 BOXES OF DONUTS WITH 8 DONUTS IN EACH BOX. HOW MANY DONUTS DID THEY HAVE ALTOGETHER?

$$\underline{9} \times \underline{8} = \underline{72}$$

THERE WERE 9 BAGS OF DONUTS IN THE BAKERY. EACH BAG HAD 3 DONUTS INSIDE. HOW MANY DONUTS WERE THERE ALTOGETHER?

$$\underline{9} \times \underline{3} = \underline{27}$$

THE BAKERY HAD 9 BOXES OF DONUTS WITH 7 DONUTS IN EACH BOX. HOW MANY DONUTS DID THEY HAVE ALTOGETHER?

$$\underline{9} \times \underline{7} = \underline{63}$$

QUIZ

Write an 9's fact in each box. Then follow the instructions in each box to match the fact.

**I CAN SKIP COUNT
BY 9'S!**

**I CAN REPRESENT 9'S
WITH EQUAL GROUPS!**

**I CAN REPRESENT 9'S
WITH ARRAYS!**

**I CAN REPRESENT 9'S
ON THE NUMBER LINE.**

**I CAN USE REPEATED
ADDITION FOR MY 9'S.**

**MY STRATEGY FOR
THINKING ABOUT 9'S IS...**

CERTIFICATE

★ GREAT MATH WORK! ★

HAS SUCCESSFULLY PRACTICED THE
9 TIMES TABLES!

GREAT JOB!

TEACHER: _____ DATE: _____

9

Multiplication

$$9 \times 1 = 9$$

$$9 \times 2 = 18$$

$$9 \times 3 = 27$$

$$9 \times 4 = 36$$

$$9 \times 5 = 45$$

$$9 \times 6 = 54$$

$$9 \times 7 = 63$$

$$9 \times 8 = 72$$

$$9 \times 9 = 81$$

$$9 \times 10 = 90$$

Hint: Multiply by 10
and then subtract 1
set.

9

MULTIPLICATION

$$9 \times 1 = 9$$

$$9 \times 2 = 18$$

$$9 \times 3 = 27$$

$$9 \times 4 = 36$$

$$9 \times 5 = 45$$

$$9 \times 6 = 54$$

$$9 \times 7 = 63$$

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9

MULTIPLICATION

$$9 \times 1 = 9$$

$$9 \times 2 = 18$$

$$9 \times 3 = 27$$

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Hint: Multiply by 10
and then subtract 1
set.