

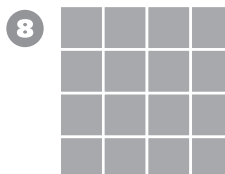
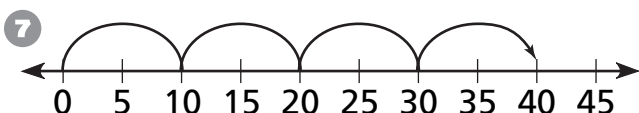
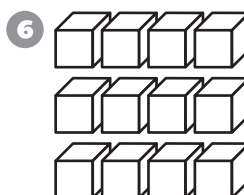
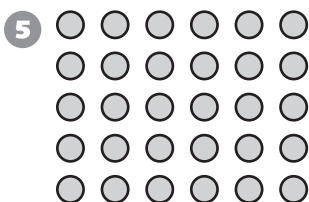
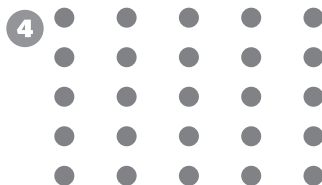
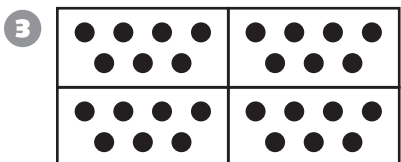
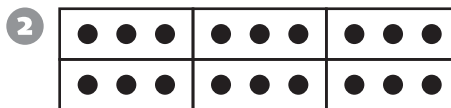
Introducing Arrays

Write the fact family for each diagram.
The first one is done for you.



$3 \times 9 = 27, 9 \times 3 = 27$

$27 \div 9 = 3, 27 \div 3 = 9$

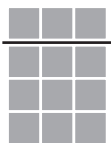


9 How does the number of sentences in a fact family with 2 identical factors compare to the number of sentences in a fact family with 2 different factors?

Separating Arrays

Find the total number of tiles in each array.

1



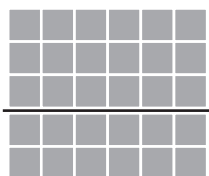
$$(1 \times 3) + (3 \times 3) = 3 + 9 = \square$$

2



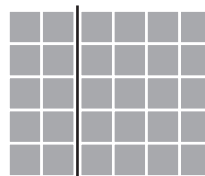
$$(4 \times 2) + (4 \times 1) = 8 + 4 = \square$$

3



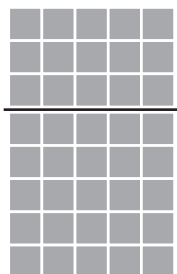
$$(3 \times 6) + (2 \times 6) = \square + \square = \square$$

4



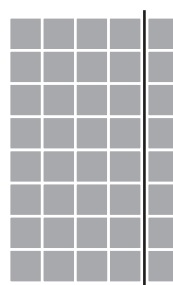
$$(5 \times 2) + (5 \times 4) = \square + \square = \square$$

5



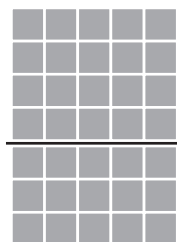
$$(3 \times 5) + (5 \times 5) = \square + \square = \square$$

6



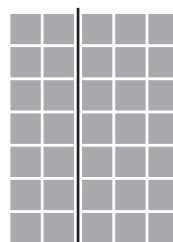
$$(8 \times 4) + (8 \times 1) = \square + \square = \square$$

7



$$(4 \times 5) + (3 \times 5) = \square + \square = \square$$

8

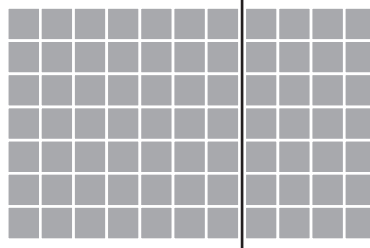


$$(7 \times 2) + (7 \times 3) = \square + \square = \square$$

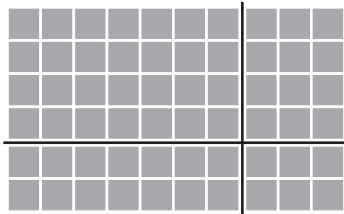
Adding Array Sections

Write the multiplication sentence shown by each part of the array. Find the sum of all the parts to find the total number of squares in the array.

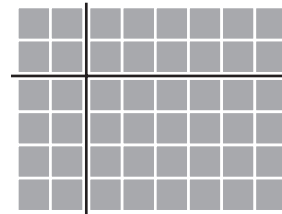
1



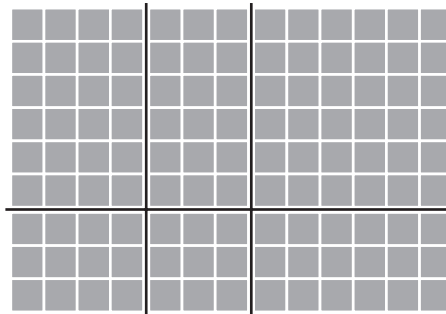
2



3



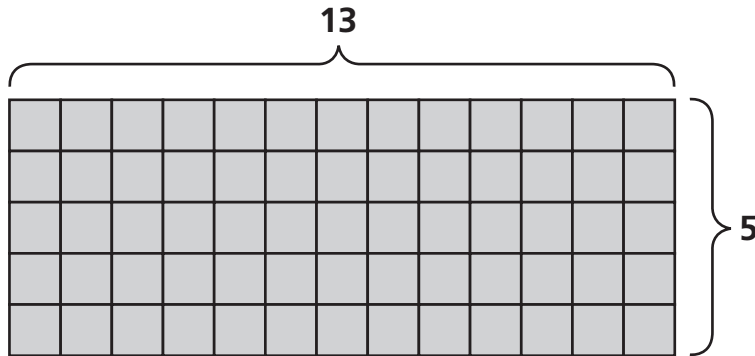
4



Exploring a Multiplication Shortcut

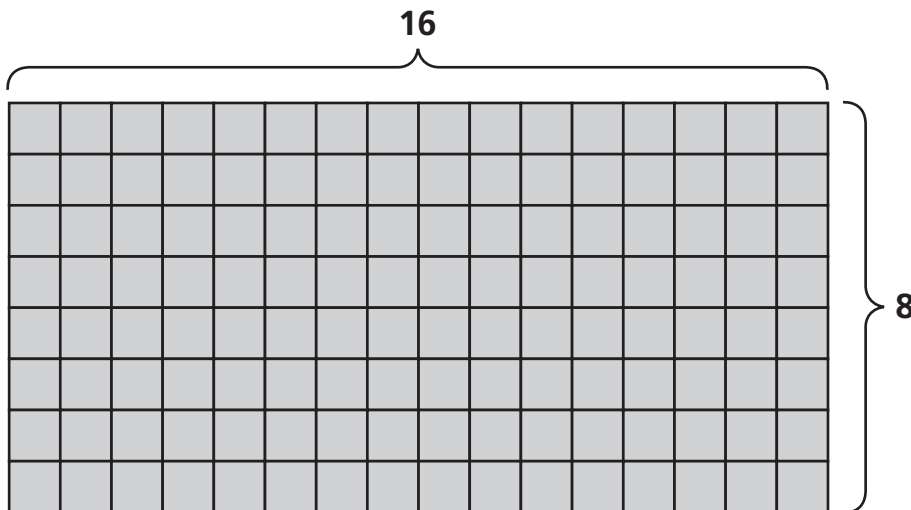
Find the number of squares in each array.

1



$$5 \times 13 = \square$$

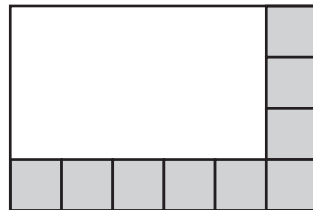
2



$$8 \times 16 = \square$$

Using a Multiplication Shortcut

For Problem 1, use the figure.



1 Number of rows in the figure _____

Number of columns in the figure _____

Number of rows + Number of columns _____

Complete the drawing.

How many small squares in all? _____

Two numbers that have a sum of 10 and a product of 24 are _____ and _____.

For Problems 2–8, find two numbers that have

2 a product of 30 and a difference of 7 _____ and _____

3 a product of 45 and a difference of 4 _____ and _____

4 a product of 60 and a difference of 4 _____ and _____

5 a product of 36 and a sum of 12 _____ and _____

6 a product of 25 and a difference of 0 _____ and _____

7 a product of 4 and a sum of 4 _____ and _____

8 a product of 18 and a sum of 11 _____ and _____

9 Create a product-and-sum or product-and-difference puzzle. Exchange with a partner and solve.

Connecting Multiplication and Division

- 1 Find the three numbers that are common to both lists.

_____, _____, and _____

A: 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60 63 66 69 72

B: 21 28 35 42 49 56 63 70 77 84 91 98

I multiplied my secret number by several other numbers and got 21, 42, and 63. My secret number is greater than 1 and less than 10. There is more than one possibility. What could my secret number be?

My secret number could be _____ or _____.

- 2 Find the number that is common to all lists. _____

A: 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44

B: 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

C: 16 24 32 40 48 56 64 72 80 88 96

I multiplied my secret number by another number and got 40. My secret number is greater than 1 and less than 10. There is more than one possibility. What could my number be?

My secret number could be _____ or _____ or _____.

- 3 I multiplied several numbers by my secret number and got 24, 36, 54. If my secret number is greater than 1, what is my secret number? There is more than one possibility.
-
-

- 4 I multiplied several numbers by my secret number and got 36, 48, and 60. How many possibilities can you find for my secret number? What are they?
-

Arrays with Leftovers

I divided some numbers by a secret number.
 Each table shows a different pattern. Find the
 secret number in each case.

1	Number divided	9	17	23	35	41	45
	Remainder	1	1	1	1	1	1

My secret number is _____.

2	Number divided	18	22	34	40	59	67
	Remainder	8	2	4	0	9	7

My secret number is _____.

3	Number divided	12	14	16	21	35	39
	Remainder	0	2	0	1	3	3

My secret number is _____.

4	Number divided	15	20	25	30	35	40
	Remainder	3	2	1	0	5	4

My secret number is _____.

5	Number divided	19	22	25	28	31	34
	Remainder	1	1	1	1	1	1

My secret number is _____.

6	Number divided	23	28	35	41	46	51
	Remainder	3	3	0	1	1	1

My secret number is _____.

Working with Remainders

Sammy brought fewer than 21 cookies to share with friends. He put some on the table. The rest are in the bag.



- 1 Sammy shared his cookies equally with 4 friends. Some cookies were left over.

Number of cookies	13	14	15	16	17	18	19	20
Left over	3	4	0	1	2	3	4	0

When you divide by 5, what remainders are possible? _____

- 2 Sammy shared his cookies equally with 6 friends. Some cookies were left over.

Number of cookies	13	14	15	16	17	18	19	20
Left over	6	0	1	2	3	4	5	6

When you divide by 7, what remainders are possible? _____

- 3 What remainders are possible when you divide by the following numbers?

A. by 2 _____

C. by 4 _____

B. by 3 _____

D. by 6 _____

- 4 Make up a rule that tells what remainders are possible for any divisor.
