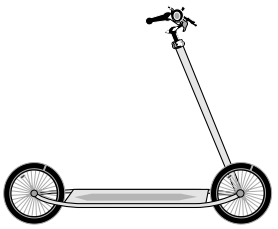
CHAPTER 9

1 Using Adding to Multiply

Goal **Multiply using skip counting and addition.**

1. Show how many wheels there are on 5 scooters in each way.

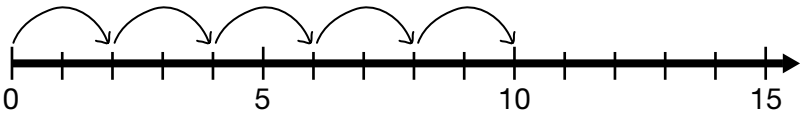


scooter

a) Draw 5 groups of wheels.

○ ○ ○ ○ ○
○ ○ ○ ○ ○

b) Skip count on a number line.



c) Write an addition sentence. 2 + 2 + 2 + 2 + 2 = 10

d) Write a multiplication fact. 5 x 2 = 10

2. Write an addition sentence and multiplication sentence for each.

a) 

5 + 5 + 5 = 15

3 x 5 = 15

b) 7 groups of 2 2 + 2 + 2 + 2 + 2 + 2 + 2 = 14 7 x 2 = 14

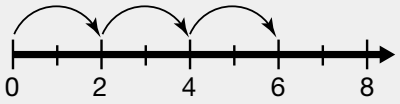
3. Calculate each product. Use toothpicks, buttons, or some other small items as counters if you wish.

a) 2 × 5 = 10 **d)** 6 × 2 = 12 **g)** 5 × 5 = 25

b) 4 × 2 = 8 **e)** 6 × 5 = 30 **h)** 3 × 2 = 6

c) 4 × 5 = 20 **f)** 7 × 5 = 35 **i)** 2 × 2 = 4

At-Home Help



is **skip counting** on a number line.

2 + 2 + 2 = 6
is an **addition sentence**.

3 × 2 = 6
is a **multiplication fact**.

The **product** is 6 and the **factors** are 3 and 2.

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CHAPTER 9

2 Solve Problems by Guessing and Testing

Goal **Use guessing and testing to solve problems.**

1. 70 students voted to decide where to go for the grade 3 field trip.

Places for the Grade 3 Trip

museum

zoo

aquarium

Each ✋ means ■ students.

a) How many students does each ✋ represent?

5

b) How many students voted for each place?

museum: 15
zoo: 35
aquarium: 20

2. Jordie has 5 of the same coins. He has less than 30¢. How much money could Jordie have?

Jordie could have 25¢ (5 nickels) or 5¢ (5 pennies).

3. Mia has 33¢ in her pocket. She has only 3 pennies. What are all the different combinations of coins she could have?

1 quarter, 1 nickel, 3 pennies
3 dimes, 3 pennies
2 dimes, 2 nickels, 3 pennies
1 dime, 4 nickels, 3 pennies
6 nickels, 3 pennies

At-Home Help

Guessing and testing is a useful problem-solving strategy. You can use guessing and testing to find out how many students each 🐟 represents.

Favourite Fish for 18 Students

tetra

goldfish

Each 🐟 means ■ students.

18 students were surveyed, but there are not 18 🐟.

Guess 5 for each 🐟.
Test by skip counting.

5 10 15

20

That's a lot more than 18.

Guess 2 for each 🐟.

2 4 6

8 10 12 14 16 18

That's correct, so each 🐟 means 2 students.

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CHAPTER 9

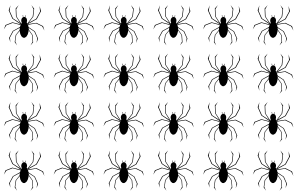
3

Arrays and Multiplication

Goal **Use arrays to represent and solve multiplication problems.**

1. Write 2 related multiplication facts for each array.

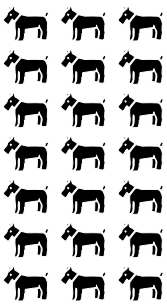
a)



4 x 6 = 24

6 x 4 = 24

b)



7 x 3 = 21

3 x 7 = 21

At-Home Help

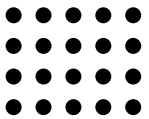
An **array** is a rectangular arrangement of objects or pictures.

Related multiplication facts are 2 facts that describe the same array.

$2 \times 4 = 8$ $4 \times 2 = 8$

2. Sketch 1 array for each. Write the related multiplication facts.

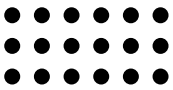
a) 4×5



4 x 5 = 20

5 x 4 = 20

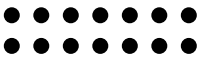
b) 3×6



3 x 6 = 18

6 x 3 = 18

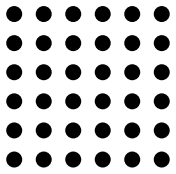
c) 2×7



2 x 7 = 14

7 x 2 = 14

d) 6×6

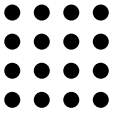


6 x 6 = 36

3. a) How many facts can you write for 6×6 in Question 2 d)? 1

b) Sketch another array that is like 6×6.

Answers will vary.
For example:



5. Complete this sentence.

If I know 7 × 5 = 35, then I know 5 × 7 = 35.

or 5 x 7 = 35 and 7 x 5 = 35

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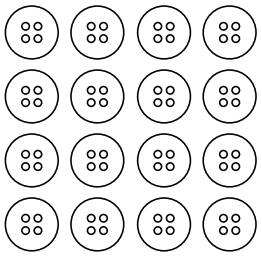
CHAPTER 9

4 Doubling

Goal **Relate multiplication facts using a doubling strategy.**

1. a) This array shows 2 sets of 4 buttons. Extend the array to make 4 sets of 4 buttons.



b) How does your array show that 4×4 is double 2×4? It doubles because there are 4 sets of 4 buttons, not 2. In other words, 2 x 4 becomes 4 x 4.

At-Home Help

To **double a number**, multiply the number by 2 or add the number to itself.
To double 6, use $2 \times 6 = 12$ or $6 + 6 = 12$.

To **double a multiplication fact**, multiply one of the factors and the product by 2.
To double $4 \times 3 = 12$, use $4 \times 6 = 24$ or $8 \times 3 = 24$.

2. Use $5 \times 4 = 20$ to calculate $5 \times 8 =$ 40.

3. How many mittens are needed for each?

a) 2 sets of twins

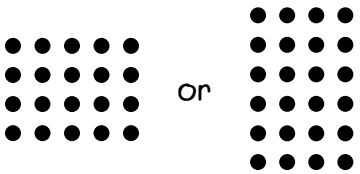
8 mittens

b) 2 sets of quadruplets

16 mittens

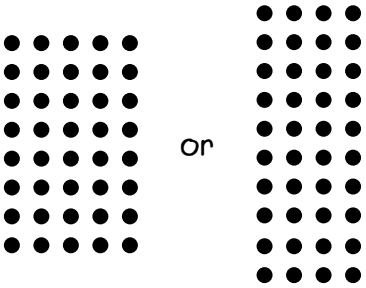
4. a) Sketch an array to show 4×5. Write the multiplication fact.

4 x 5 = 20



b) Double the number of rows in the array. Write the multiplication fact.

8 x 5 = 40 or 10 x 4 = 40



5. Complete each doubled fact.

a) $4 \times 3 = 12$, so $4 \times 6 =$ 24.

b) $5 \times 3 = 15$, so $5 \times 6 =$ 30.

c) $3 \times 7 = 21$, so $6 \times 7 =$ 42.

d) $3 \times 6 = 18$, so $6 \times 6 =$ 36.

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CHAPTER 9

5 Relating Multiplication Facts

Goal **Show different ways to multiply.**

1. a) $5 \times 5 = 25$ and $2 \times 5 = 10$,

so $7 \times 5 =$ 35.

b) 5 groups of 3 = 15
2 groups of 3 = 6

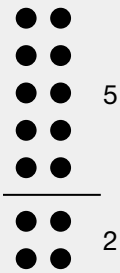
So 7 groups of 3 = 21.

2. Colin remembers $7 \times 7 = 49$,
but he can't remember 6×7.
Is 6×7 greater than or less than 49? less

Explain. For example, 6 is less than 7,
so 6 x 7 is less than 7 x 7.

At-Home Help

This **array** shows how to find 7×2 by adding other facts of 2.



$5 \times 2 = 10$

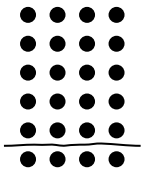
$2 \times 2 = 4$

So $7 \times 2 = 14$.

3. Draw a sketch to show how to find each product by using 2 arrays.

Answers will vary. For example:

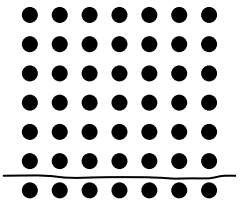
a) $6 \times 4 = 24$



5 x 4 = 20

1 x 4 = 4

b) $7 \times 7 = 49$



6 x 7 = 42

1 x 7 = 7

4. You remember $4 \times 4 = 16$, but you forget 4×7.

Is 4×7 greater than or less than double 16? less

Explain. For example, since 4 x 4 = 16, then 4 x 8 = 32.
4 x 7 is less than 4 x 8, so 4 x 7 is less than double 16, or 32.

5. Paulette's dog is 4 years old. How many human years is that?
Remember that 1 dog year is like 7 human years.

28 human years

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CHAPTER 9

6 Making a Multiplication Table

Goal **Use strategies to complete a multiplication table.**

Use the multiplication table below.

1. a) Count by 1s to complete row 1.

b) Skip count by 2s to complete row 2.

c) Skip count by 5s to complete row 5.

d) Complete columns 1, 2, and 5.

2. a) Add row 1 and row 2 to complete row 3. For example, in the square where row 3 and column 1 cross, write 3 because $1 + 2 = 3$.

b) Complete column 3.

3. a) Double row 2 to complete row 4.

b) Double row 3 to complete row 6.

c) Which columns will you complete in a similar way?

Columns 4 and 6

4. Complete row 7 and column 7. What method did you use?

Answers will vary. For example, it was all filled in from having done the columns except for 7 x 7, which is 7 more than 6 x 7, or 49.

At-Home Help

When completed, the multiplication table will display all the multiplication facts up to 7×7.

To find 2×3, find the square where row 2 crosses column 3. The product 6 belongs in this square.

column ↓

row →

×	1	2	3	4	5	6	7
1	1	2	3	4	5	6	7
2	2	4	6	8	10	12	14
3	3	6	9	12	15	18	21
4	4	8	12	16	20	24	28
5	5	10	15	20	25	30	35
6	6	12	18	24	30	36	42
7	7	14	21	28	35	42	49

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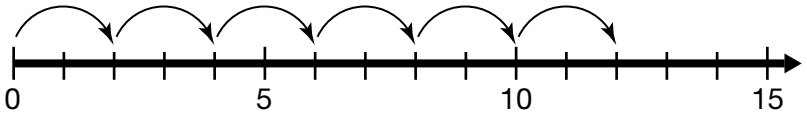
Test Yourself

Circle the correct answer.

1. Which multiplication fact is shown on this number line?



A. $5 \times 2 = 10$ **B.** $4 \times 5 = 20$ **C.** $6 \times 2 = 12$ **D.** $3 \times 5 = 15$

2. Which multiplication fact matches this picture?

E. $5 \times 5 = 25$ **F.** $5 \times 3 = 15$ **G.** $5 \times 1 = 5$ **H.** $5 \times 4 = 20$

3. How many students does each ● represent?

Favourite Pet for 30 Students

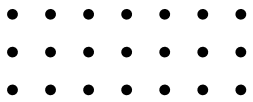
dog ● ● ● ●

cat ● ●

Each ● means ■ students.

A. 1 **B.** 2 **C.** 5 **D.** 10

4. Which related multiplication facts match this array?

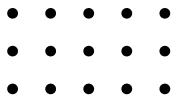


E. 6×7 and 7×6 **G.** 3×7 and 7×3

F. 3×6 and 6×3 **H.** 2×7 and 7×2

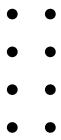
5. Which array matches $3 \times 4 = 12$?

A.

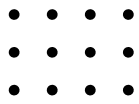


B.

C.



D.



6. Which multiplication fact shows **double** the fact $2 \times 3 = 6$?

E. $4 \times 3 = 12$ **F.** $4 \times 6 = 24$ **G.** $2 \times 4 = 8$ **H.** $1 \times 3 = 3$

7. Which number completes the sentence $7 \times 5 = \blacksquare \times 7$?

A. 3 **B.** 4 **C.** 5 **D.** 7

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