Factors and Multiples

Essential Question How are factors and multiples related?

🔑 Unlock the Problem Real World

Toy animals are sold in sets of 3, 5, 10, and 12. Mason wants to make a display with 3 animals in each row. Which sets could he buy, if he wants to display all of the animals?

The product of two numbers is a multiple of each number. Factors and multiples are related.

$$3 \times 4 = 12$$

↑   ↑   ↑

factor   factor   multiple of 3
multiple of 4

- How many animals will be in each row?

  _____

- How many animals are sold in each set?

  _____

🔒 One Way Find factors.

Tell whether 3 is a factor of each number.
Think: If a number is divisible by 3, then 3 is a factor of the number.

Is 3 a factor of 3? _____

Is 3 a factor of 5? _____

Is 3 a factor of 10? _____

Is 3 a factor of 12? _____

3 is a factor of _____ and _____.

🔒 Another Way Find multiples.

Multiply and make a list.   __3__, _____, _____, _____, _____, ...

                    1×3 2×3 3×3 4×3 5×3

_____ and _____ are multiples of 3.

So, Mason could buy sets of _____ and _____ toy animals.

Math Talk **MATHEMATICAL PRACTICES ⑥**

Explain how you can use what you know about factors to determine whether one number is a multiple of another number.

Common Multiples A **common multiple** is a multiple of two or more numbers.

🔑 Example Find common multiples.

Tony works every 3 days and Amanda works every 5 days. If Tony works June 3 and Amanda works June 5, on what days in June will they work together?

Circle multiples of 3. Draw a box around multiples of 5.

June						
Sun	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Think: The common multiples have both a circle and a box.

The common multiples are _____ and _____.

So, Tony and Amanda will work together on June _____ and June _____.

Share and Show MATH BOARD

1. Multiply to list the next five multiples of 4.

_____4_____, _____, _____, _____, _____, _____

1 × 4

Is the number a factor of 6? Write *yes* or *no.*

✓ **2.** 3   **3.** 6   **4.** 16   **5.** 18

_____   _____   _____   _____

Is the number a multiple of 6? Write *yes* or *no.*

✓ **6.** 3   **7.** 6   **8.** 16   **9.** 18

_____   _____   _____   _____

Name _____

On Your Own

Is the number a multiple of 3? Write *yes* or *no*.

10. 4

11. 8

12. 24

13. 38

_____   _____   _____   _____

14. List the next nine multiples of each number. Find the common multiples.

Multiples of 2: 2, _____

Multiples of 8: 8, _____

Common multiples: _____

MATHEMATICAL PRACTICE ⑧ **Generalize** **Algebra** **Find the unknown number.**

15. 12, 24, 36, _____

16. 25, 50, 75, 100, _____

Tell whether 20 is a factor or multiple of the number.
Write *factor, multiple,* or *neither*.

17. 10

18. 20

19. 30

_____   _____   _____

THINK SMARTER **Write *true* or *false*. Explain.**

20. Every whole number is a multiple of 1.

21. Every whole number is a factor of 1.

_____

_____

_____

_____

22. **THINK SMARTER** Julio wears a blue shirt every 3 days. Larry wears a blue shirt every 4 days. On April 12, both Julio and Larry wore a blue shirt. What is the next date that they will both wear a blue shirt?
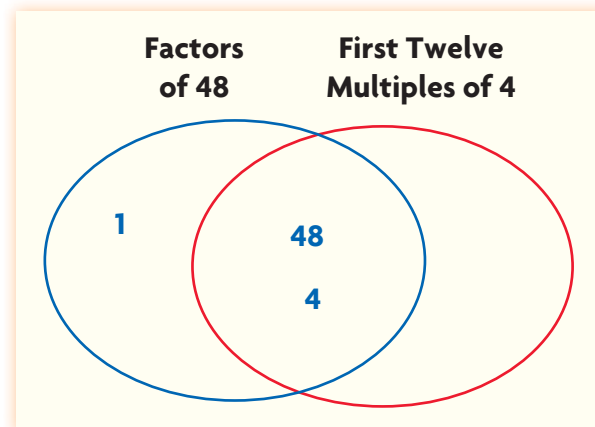
_____

April						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Problem Solving • Applications (Real World)

Complete the Venn diagram. Then use it to solve 23–25.

23. What multiples of 4 are not factors of 48?

_____

24. What factors of 48 are multiples of 4?

_____

25. **GO DEEPER** **Pose a Problem** Look back at Problem 24. Write a similar problem by changing the numbers. Then solve.

_____

_____

	Factors of 48	First Twelve Multiples of 4

1   48   4

26. Kia paid $10 for two charms. The price of each charm was a multiple of $2. What are the possible prices of the charms?

_____

27. **MATHEMATICAL PRACTICE 7** **Look for Structure** The answer is 9, 18, 27, 36, 45. What is the question?

_____

28. **WRITE** ▸ *Math* How do you know whether a number is a multiple of another number?

_____

_____

WRITE ▸ *Math*
Show Your Work

29. **THINK SMARTER** For numbers 29a–29e, select True or False for each statement.

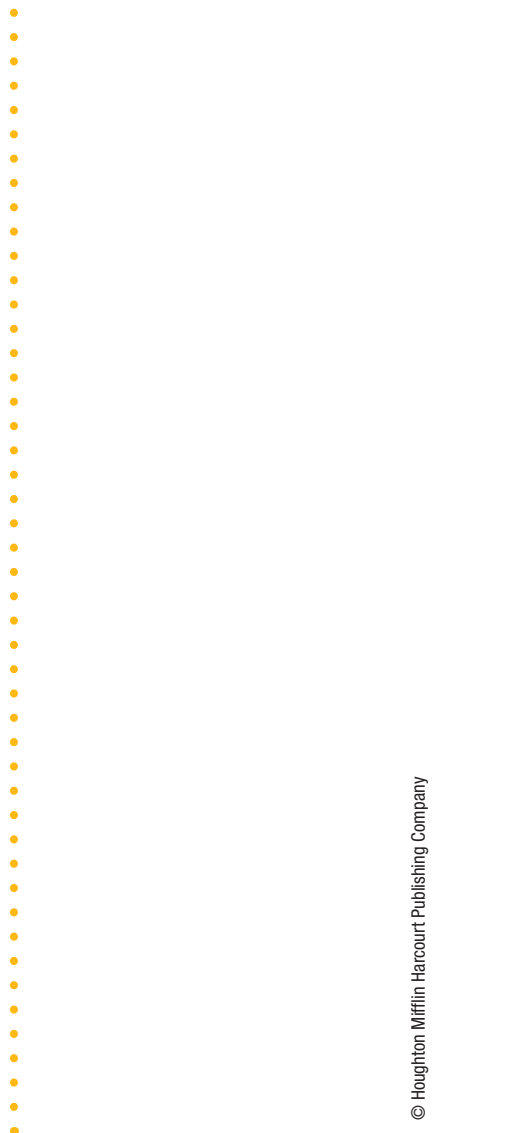29a. The number 45 is a multiple of 9.   ○ True   ○ False

29b. The number 4 is a multiple of 16.   ○ True   ○ False

29c. The number 28 is a multiple of 4.   ○ True   ○ False

29d. The number 4 is a factor of 28.   ○ True   ○ False

29e. The number 32 is a factor of 8.   ○ True   ○ False

Factors and Multiples

Is the number a multiple of 8? Write *yes* or *no*.

1. 4

Think: Since $4 \times 2 = 8$, 4 is a *factor* of 8, not a multiple of 8.

_____**no**_____

2. 8

_____

3. 20

_____

4. 40

_____

List the next nine multiples of each number.
Find the common multiples.

5. Multiples of 4: 4, _____

Multiples of 7: 7, _____

Common multiples: _____

6. Multiples of 3: 3, _____

Multiples of 9: 9, _____

Common multiples: _____

Tell whether 24 is a factor or multiple of the number.
Write *factor*, *multiple*, or *neither*.

7. 6 _____

8. 36 _____

9. 48 _____

Problem Solving *Real World*

10. Ken paid $12 for two magazines. The cost of each magazine was a multiple of $3. What are the possible prices of the magazines?

_____

11. Jodie bought some shirts for $6 each. Marge bought some shirts for $8 each. The girls spent the same amount of money on shirts. What is the least amount they could have spent?

_____

12. **WRITE** *Math* Write a word problem that can be solved by finding the numbers that have 4 as a factor.

_____

Lesson Check

1. Of the numbers listed below, which are NOT multiples of 4?

2, 4, 7, 8, 12, 15, 19, 24, 34

2. What number is a common multiple of 5 and 9?

Spiral Review

3. Jenny has 50 square tiles. She arranges the tiles into a rectangular array of 4 rows. How many tiles will be left over?

4. Jerome added two numbers. The sum was 83. One of the numbers was 45. What was the other number?

5. There are 18 rows of seats in the auditorium. There are 24 seats in each row. How many seats are in the auditorium?

6. The population of Riverdale is 6,735. What is the value of the 7 in the number 6,735?

FOR MORE PRACTICE GO TO THE
Personal Math Trainer