Chapter 5

Factors, Multiples, and Patterns

Show What You Know

Check your understanding of important skills.

Name _____

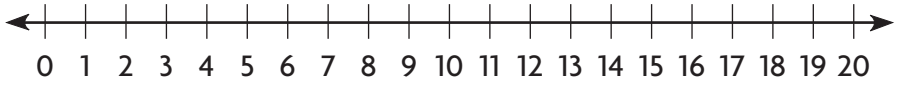
Skip-Count Skip-count to find the unknown numbers.

1. Skip count by 3s.

3, _____, _____, _____

2. Skip count by 5s.

5, _____, _____, _____

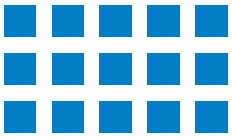


Arrays Use the array to find the product.

3.

_____ rows of _____ = _____

4.



_____ rows of _____ = _____

Multiplication Facts Find the product.

5. $4 \times 5 =$ _____

6. $9 \times 4 =$ _____

7. $6 \times 7 =$ _____

Recycled plastic helps keep people warm. Some factories use recycled plastic, combined with other fabrics, to make winter jackets. A warehouse has 46 truckloads of recycled plastic. They use 8 truckloads each day. When there are fewer than 16 truckloads, more needs to be ordered. Be a Math Detective. Figure out how many truckloads will be left after 2 days. After 3 days. When will more need to be ordered?

Vocabulary Builder

Visualize It

Complete the flow map by using the words with a ✓.

Multiplying

What is it?	What are some examples?
_____ →	$2 \times 4 = 8$
_____ →	$2 \times 4 = 8$
_____ →	

Review Words

- ✓ array
- multiple
- ✓ product

Preview Words

- common factor
- common multiple
- composite number
- divisible
- ✓ factor
- pattern
- prime number
- term

Understand Vocabulary

Complete the sentences by using preview words.

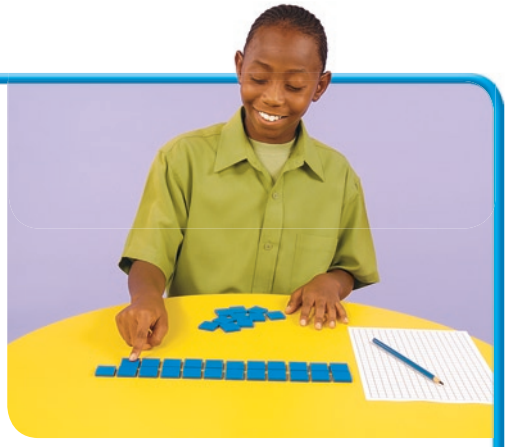
1. A number that is a factor of two or more numbers is a _____.
2. A number that is a multiple of two or more numbers is a _____.
3. A number that has exactly two factors, 1 and itself, is a _____.
4. A number that has more than two factors is a _____.
5. A number is _____ by another number if the quotient is a counting number and the remainder is 0.
6. An ordered set of numbers or objects is a _____.
7. Each number in a pattern is called a _____.

Name _____

Model Factors

Essential Question How can you use models to find factors?

UNLOCK the Problem REAL WORLD



A **factor** is a number multiplied by another number to find a product. Every whole number greater than 1 has at least two factors, that number and 1.

$18 = 1 \times 18$ $\quad 7 = 7 \times 1$ $\quad 342 = 1 \times 342$

(1 and 18 are factors)

Many numbers can be broken into factors in different ways.

$16 = 1 \times 16$ $\quad 16 = 4 \times 4$ $\quad 16 = 2 \times 8$

Math Idea

When you are asked to find factors of a whole number, only list factors that are also whole numbers.

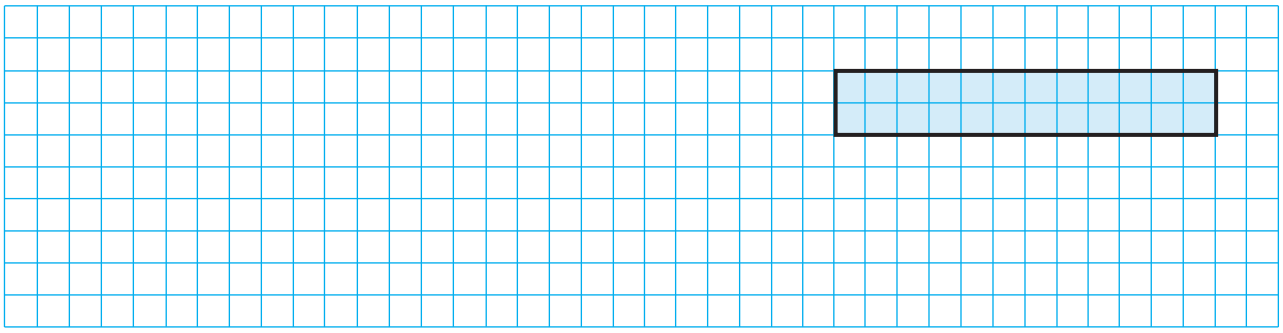
Activity Model and record the factors of 24.

Materials ■ square tiles

Use all 24 tiles to make as many different arrays as you can. Record the arrays in the grid, and write the factors modeled.

$2 \times 12 = 24$

Factors: _____, _____



_____ × _____ = 24 $\quad$ _____ × _____ = 24 $\quad$ _____ × _____ = 24

Factors: _____, _____ $\quad$ Factors: _____, _____ $\quad$ Factors: _____, _____

The factors of 24, from least to greatest, are

_____, _____, _____, _____, _____, _____, _____, and _____.

Two factors that make a product are sometimes called a factor pair. How many factor pairs does 24 have? **Explain**.

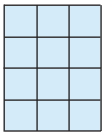
_____

MATHEMATICAL PRACTICES

Math Talk Can you arrange the tiles in each array another way and show the same factors? **Explain**.

Share and Show MATH BOARD

1. Use the arrays to name the factors of 12.



_____ × _____ = 12

_____ × _____ = 12

_____ × _____ = 12

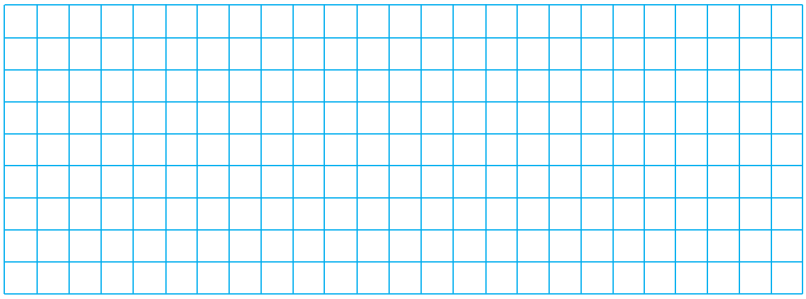
The factors of 12 are 1, _____, 3, _____, 6, and _____.

MATHEMATICAL PRACTICES

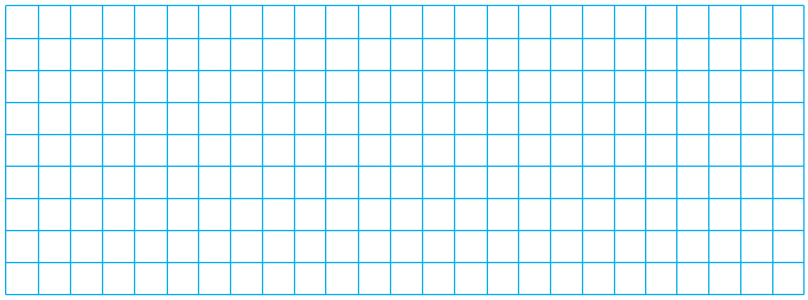
Math Talk **Explain** how the numbers 3 and 12 are related. Use the word *factor* in your explanation.

Use tiles to find all the factors of the product. Record the arrays and write the factors shown.

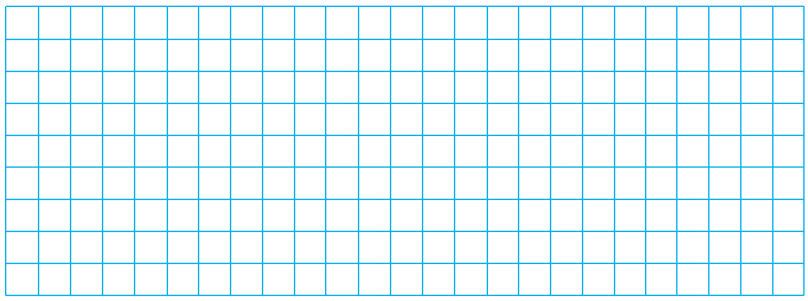
2. 5: _____



3. 20: _____



4. 25: _____



Name _____

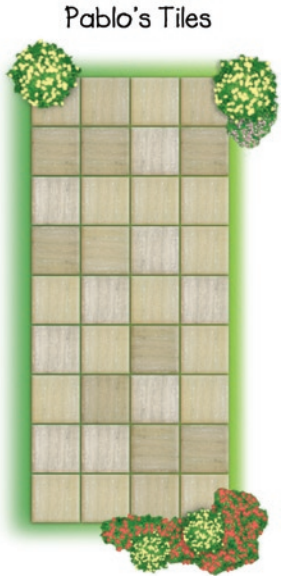
On Your Own

Practice: Copy and Solve Use tiles to find all the factors of the product. Record the arrays on grid paper and write the factors shown.

5. 9 **6.** 21 **7.** 17 **8.** 18

Problem Solving REAL WORLD

Use the diagram for 9–10.



9. Write Math Pablo is using 36 tiles to make a patio. Can he arrange the tiles in another way and show the same factors? Draw a quick picture and **explain**.

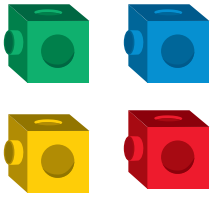
10. How many different rectangular arrays can Pablo make with all 36 tiles, so none of the arrays show the same factors?

11. H.O.T. If 6 is a factor of a number, what other numbers must be factors of the number?

12. Jean spent $16 on new T-shirts. If each shirt cost the same whole-dollar amount, how many could she have bought?

UNLOCK the Problem REAL WORLD

13. Carmen has 18 connecting cubes. She wants to model a house shaped like a rectangle. If the model has a height of one connecting cube, how many different ways can Carmen model the house using all 18 connecting cubes?



a. What do you need to know? _____

_____

b. How is finding the number of ways to model a rectangular house related to finding factor pairs? _____

_____

_____

c. Why is finding the factor pairs only the first step in solving the problem? _____

_____

_____

d. Show the steps you used to solve the problem.

_____

_____

_____

_____

e. Complete the sentences. Factor pairs for 18 are _____

_____

There are _____ different ways Carmen can arrange the cubes to model the house.

14. How many ways could Carmen make a rectangular house if she used 24 connecting cubes? **Explain.**

_____

_____

_____

15. **Test Prep** Which of the following shows a factor pair for the number 16?

Ⓐ 2 and 8

Ⓑ 2 and 32

Ⓒ 8 and 16

Ⓓ 16 and 32

FOR MORE PRACTICE:
Standards Practice Book, pp. P97–P98

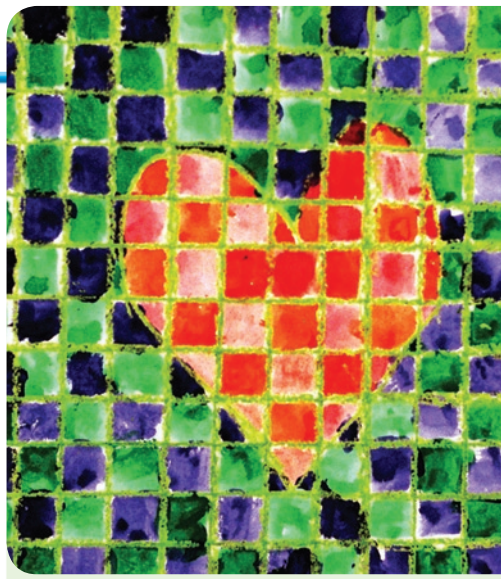
Name _____

Factors and Divisibility

Essential Question How can you tell whether one number is a factor of another number?

UNLOCK the Problem REAL WORLD

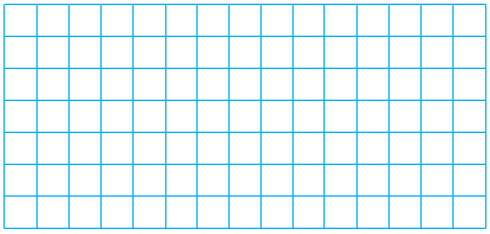
Students in Carlo's art class painted 32 square tiles for a mosaic. They will arrange the tiles to make a rectangle. Can the rectangle have 32 tiles arranged into 3 equal rows, without gaps or overlaps?



▲ Mosaics are decorative patterns made with pieces of glass or other materials.

One Way Draw a model.

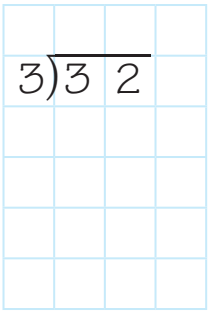
Think: Try to arrange the tiles into 3 equal rows to make a rectangle.



A rectangle _____ have 32 tiles arranged into 3 equal rows.

Another Way Use division.

If 3 is a factor of 32, then the unknown factor in 3 × ▢ = 32 is a whole number.



Think: Divide to see whether the unknown factor is a whole number.

The unknown factor in 3 × ▢ = 32 _____ a whole number.

So, a rectangle _____ have 32 tiles arranged in 3 rows.

Math Idea

A factor of a number divides the number evenly. This means the quotient is a whole number and the remainder is 0.

MATHEMATICAL PRACTICES

Math Talk **Explain** how the model relates to the quotient and remainder for 32 ÷ 3.

- **Explain** how you can tell if 4 is a factor of 30.

_____

_____

Divisibility Rules A number is **divisible** by another number if the quotient is a counting number and the remainder is 0.

Some numbers have a divisibility rule. You can use a divisibility rule to tell whether one number is a factor of another.

Is 6 a factor of 72?

Think: If 72 is divisible by 6, then 6 is a factor of 72.

Test for divisibility by 6:

Is 72 even? _____

What is the sum of the digits of 72?

_____ + _____ = _____

Is the sum of the digits divisible by 3?

_____

72 is divisible by _____.

So, 6 is a factor of 72.

Divisibility Rules

Number	Divisibility Rule
2	The number is even.
3	The sum of the digits is divisible by 3.
5	The last digit is 0 or 5.
6	The number is even and divisible by 3.
9	The sum of the digits is divisible by 9.

Try This! **List all the factor pairs for 72 in the table.**

Complete the table.

Factors of 72	
$1 \times 72 = 72$	1, 72
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____

Show your work.

MATHEMATICAL PRACTICES

Math Talk How are divisibility and factors related? **Explain.**

- How did you check if 7 is a factor of 72? **Explain.**

_____

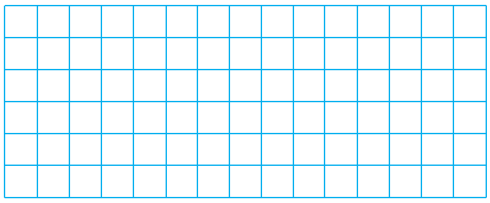
_____

Name _____

Share and Show

1. Is 4 a factor of 28? Draw a model to help.

Think: Can you make a rectangle with 28 squares in 4 equal rows?



4 _____ a factor of 28.

MATHEMATICAL PRACTICES

Math Talk If 3 is a factor of a number, is 6 always a factor of the number? **Explain**.

Is 5 a factor of the number? Write *yes* or *no*.

2. 27 _____

3. 30 _____

4. 36 _____

5. 53 _____

On Your Own

Is 9 a factor of the number? Write *yes* or *no*.

6. 54 _____

7. 63 _____

8. 67 _____

9. 93 _____

List all the factor pairs in the table.

10.

Factors of 24	
____ × ____ = ____	____, ____
____ × ____ = ____	____, ____
____ × ____ = ____	____, ____
____ × ____ = ____	____, ____

11.

Factors of 39	
____ × ____ = ____	____, ____
____ × ____ = ____	____, ____

Practice: Copy and Solve List all the factor pairs for the number. Make a table to help.

12. 56

13. 64

Problem Solving REAL WORLD

Use the table to solve 14–15.

Stamps Sets	
Country	**Number of stamps**
Germany	90
Sweden	78
Japan	63
Canada	25

14. Dirk bought a set of stamps. The number of stamps in the set he bought is divisible by 2, 3, 5, 6, and 9. Which set is it?

15. H.O.T. Geri wants to put 6 stamps on some pages in her stamp book and 9 stamps on other pages. **Explain** how she could do this with the stamp set for Sweden.

SHOW YOUR WORK

16. H.O.T. **What's the Error?** George said if 2 and 4 are factors of a number, then 8 is a factor of the number. Is he correct? **Explain.**

17. **Test Prep** Mrs. Mastrioni bought a set of 80 stamps. She wanted to give all the stamps to her students as a reward. She could give equal numbers of stamps to

Ⓐ 2 or 3 students.

Ⓑ 2 or 6 students.

Ⓒ 2, 4, 5, or 8 students.

Ⓓ 2, 4, 8, or 9 students.

Name _____

Problem Solving • Common Factors

Essential Question How can you use the *make a list* strategy to solve problems with common factors?

UNLOCK the Problem REAL WORLD

Chuck has a coin collection with 30 pennies, 24 quarters, and 36 nickels. He wants to arrange the coins into rows. Each row will have the same number of coins, and all the coins in a row will be the same. How many coins can he put in each row?

The information in the graphic organizer below will help you solve the problem.

Read the Problem

What do I need to find?

I need to find _____ that can go in each row so that each row has

_____

_____.

What information do I need to use?

Chuck has _____

_____. Each row has _____

_____

_____.

How will I use the information?

I can make a list to find all the factors of

_____. Then I can use the list to find the common factors. A **common factor** is a factor of two or more numbers.

Solve the Problem

I can list all the factors of each number. Then I can circle the factors that are common to all three numbers.

Factors of: 30 24 36

The common factors are _____.

So, Chuck can put _____, _____, _____, or _____ coins in each row.

Try Another Problem

Ryan collects animal figures. He has 45 elephants, 36 zebras, and 18 tigers. He will arrange the figures into rows. Each row will have the same number of figures, and all the figures in a row will be the same. How many figures can be in each row?

Use the graphic organizer below to help you solve the problem.

Read the Problem	Solve the Problem
What do I need to find?	
What information do I need to use?	
How will I use the information?	

So, Ryan can put _____, _____, or _____ figures in each row.

MATHEMATICAL PRACTICES

Math Talk How did making a list help you solve the problem?

Name _____

Share and Show

MATH BOARD

UNLOCK the Problem Tips

- Use the Problem-Solving MathBoard.
- Underline the important facts.

1. Lucy has 40 bean plants, 32 tomato plants, and 16 pepper plants. She wants to put the plants in rows with only one type of plant in each row. All rows will have the same number of plants. How many plants can Lucy put in each row?

SHOW YOUR WORK

First, read the problem and think about what you need to find. What information will you use? How will you use the information?

_____

_____

Next, make a list. Find the factors for each number in the problem.

_____

_____

_____

Finally, use the list. Circle the common factors.

So, Lucy can put _____, _____, _____, or _____ plants in each row.

2. **What if** Lucy has 64 bean plants instead of 40 bean plants? How many plants can Lucy put in each row?

_____

3. H.O.T. One common factor of two numbers is 40. Another common factor is 10. If both numbers are less than 100, what are the two numbers?

_____

4. The sum of two numbers is 136. One number is 51. What is the other number? What are the common factors of these two numbers?

_____

On Your Own

Choose a STRATEGY

- Act It Out
- Draw a Diagram
- Find a Pattern
- Make a Table or List
- Solve a Simpler Problem

SHOW YOUR WORK

5. H.O.T. A number is called a *perfect number* if it equals the sum of all of its factors except itself. For instance, 6 is a perfect number because its factors are 1, 2, 3, and 6, and $1 + 2 + 3 = 6$. What is the next greater perfect number?

6. H.O.T. **Write Math** Sona knits 10 squares a day for 7 days. Can she sew together the squares to make 5 equal-sized blankets? **Explain.**

7. Julianne earned $296 working at a grocery store last week. She earns $8 per hour. How many hours did Julianne work?

8. H.O.T. There are 266 students watching a play in the auditorium. There are 10 rows with 20 students in each row and 5 rows with 8 students in each row. How many students are sitting in each of the 2 remaining rows if each of those rows has an equal number of students?

9. **Test Prep** Which of the following is NOT a common factor of 24, 48, and 72?

   (A) 4

   (B) 6

   (C) 12

   (D) 48

Name _____

Mid-Chapter Checkpoint

Vocabulary

Choose the best term from the box.

Vocabulary
common factor
divisible
factor

1. A number that is multiplied by another number to find a product is called a _____. (p. 193)

2. A number is _____ by another number if the quotient is a counting number and the remainder is zero. (p. 198)

Concepts and Skills

List all the factors from least to greatest.

3. 8

_____

4. 14

_____

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

5. 81

_____

6. 45

_____

7. 42

_____

8. 56

_____

List all the factor pairs in the table.

9.

Factors of 64	
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____

10.

Factors of 44	
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____

List the common factors of the numbers.

11. 9 and 18

_____

12. 20 and 50

_____

Fill in the bubble completely to show your answer.

13. Sean places 28 tomato plants in rows. All rows contain the same number of plants. Which of these can be the number of plants in a row?

Ⓐ 3

Ⓑ 5

Ⓒ 7

Ⓓ 8

14. Ella bought some key chains. If she paid $24 for the key chains, and each one cost the same whole-dollar amount, how many could she have bought?

Ⓐ 5

Ⓑ 6

Ⓒ 7

Ⓓ 10

15. Sandy has 16 roses, 8 daisies, and 32 tulips. She wants to arrange all the flowers in bouquets. Each bouquet has the same number of flowers and the same type of flower. How many flowers could be in a bouquet?

Ⓐ 3

Ⓑ 6

Ⓒ 8

Ⓓ 16

16. Amir arranged 9 photos on a bulletin board. He put the photos in rows. Each row contains the same number of photos. How many photos could be in each row?

Ⓐ 1, 3, or 6

Ⓑ 1, 2, or 9

Ⓒ 1, 3, or 9

Ⓓ 3, 6, or 9

Name _____

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?

- How many animals will be in each row?

_____

- How many animals are sold in each set?

_____

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

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.

MATHEMATICAL PRACTICES

Math Talk **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

MATHEMATICAL PRACTICES

Math Talk How are the numbers 5 and 15 related? **Explain.**

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 _____

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

14. Multiples of 2: 2, _____

Multiples of 8: 8, _____

Common multiples: _____

15. Multiples of 5: 5, _____

Multiples of 10: 10, _____

Common multiples: _____

16. Multiples of 6: 6, _____

Multiples of 7: 7, _____

Common multiples: _____

Algebra **Find the unknown number.**

17. 12, 24, 36, _____ **18.** 25, 50, 75, 100, _____

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

19. 10 _____ **20.** 20 _____ **21.** 30 _____

H.O.T. **Write *true* or *false*. Explain.**

22. Every whole number is a multiple of 1.

_____

_____

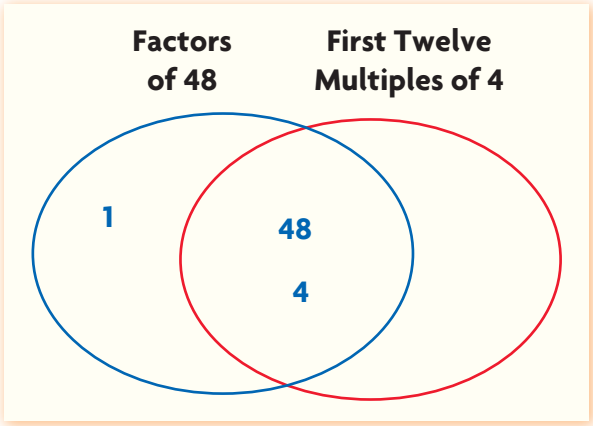
23. Every whole number is a factor of 1.

_____

_____

Problem Solving REAL WORLD

Complete the Venn diagram. Then use it to solve 24–26.



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

25. What factors of 48 are multiples of 4?

26. H.O.T. **Pose a Problem** Look back at Problem 24. Write a similar problem by changing the numbers. Then solve.

SHOW YOUR WORK

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

28. H.O.T. **What's the Question?** The answer is 9, 18, 27, 36, 45.

29. Write Math How do you know whether a number is a multiple of another number?

30. **Test Prep** Sophie is planting a garden. Her garden is divided into equal sections, each measuring 4 meters in length. Which could be the total length of her garden?

Ⓐ 24 meters
Ⓒ 27 meters
Ⓑ 25 meters
Ⓓ 30 meters

FOR MORE PRACTICE:
Standards Practice Book, pp. P103–P104

Name _____

Prime and Composite Numbers

Essential Question How can you tell whether a number is prime or composite?

UNLOCK the Problem REAL WORLD

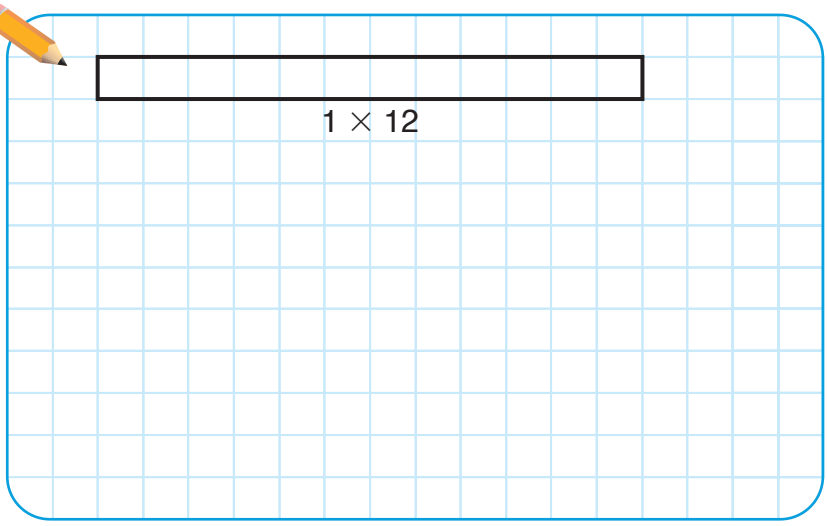
Students are arranging square tables to make one larger, rectangular table. If the students want to choose from the greatest number of ways to arrange the tables, should they use 12 or 13 square tables?

- What are the factors of 12?

_____

Use a grid to show all the possible arrangements of 12 and 13 tables.

Draw all of the possible arrangements of 12 tables and 13 tables. Label each drawing with the factors modeled.



ERROR Alert

The same factors in a different order should be counted only once. For example, 3 × 4 and 4 × 3 are the same factor pair.

So, there are more ways to arrange _____ tables.

MATHEMATICAL PRACTICES

Math Talk **Explain** how knowing whether 12 and 13 are prime or composite could have helped you solve the problem above.

- A **prime number** is a whole number greater than 1 that has exactly two factors, 1 and itself.
- A **composite number** is a whole number greater than 1 that has more than two factors.

Factors of 12: _____, _____, _____, _____, _____, _____

Factors of 13: _____, _____

12 is a _____ number, and 13 is a _____ number.

Divisibility You can use divisibility rules to help tell whether a number is prime or composite. If a number is divisible by any number other than 1 and itself, then the number is composite.

Tell whether 51 is *prime* or *composite*.

Is 51 divisible by 2?

_____

Is 51 divisible by 3?

_____

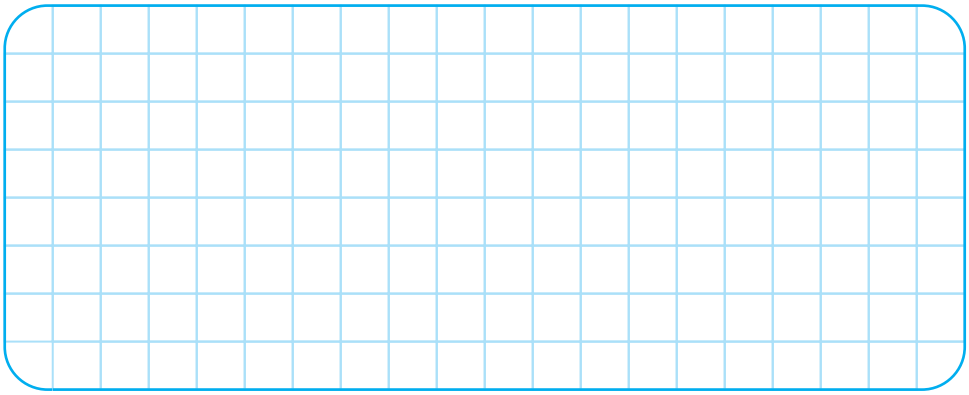
Think: 51 is divisible by a number other than 1 and 51.
51 has more than two factors.

So, 51 is _____.

Math Idea
The number 1 is neither prime nor composite, since it has only one factor: 1.

Share and Show MATH BOARD

1. Use the grid to model the factors of 18. Tell whether 18 is *prime* or *composite*.



Factors of 18: _____, _____, _____, _____, _____, _____

Think: 18 has more than two factors.

So, 18 is _____.

Tell whether the number is *prime* or *composite*.

2. 11
Think: Does 11 have other factors besides 1 and itself?
_____

3. 73
_____

4. 69
_____

5. 42
_____

MATHEMATICAL PRACTICES
Math Talk Is the product of two prime numbers prime or composite? **Explain.**

Name _____

On Your Own

Tell whether the number is *prime* or *composite*.

6. 18 _____

7. 49 _____

8. 29 _____

9. 64 _____

10. 33 _____

11. 89 _____

12. 52 _____

13. 76 _____

Write *true* or *false* for each statement. Explain or give an example to support your answer.

14. The number 1 is not prime.

_____

_____

_____

15. A composite number cannot have three factors.

_____

_____

_____

16. Only odd numbers are prime numbers.

_____

_____

_____

17. Every multiple of 7 is a composite number.

_____

_____

_____

Problem Solving

18. Name a 2-digit odd number that is prime. Name a 2-digit odd number that is composite.

_____

_____

19. **Test Prep** The number 2 is

Ⓐ prime

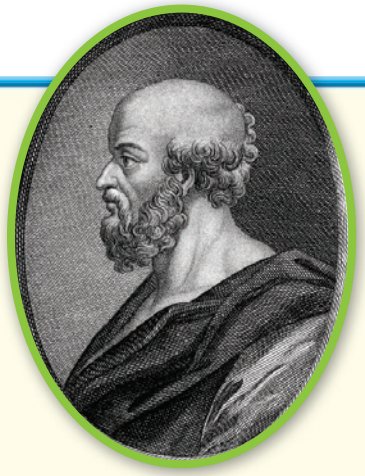
Ⓑ composite

Ⓒ neither prime nor composite

Ⓓ both prime and composite

Connect to Social Studies

The Sieve of Eratosthenes



Eratosthenes was a Greek mathematician who lived more than 2,200 years ago. He invented a method of finding prime numbers, which is now called the Sieve of Eratosthenes.

20. Follow the steps below to circle all prime numbers less than 100. Then list the prime numbers.

STEP 1

Cross out 1, since 1 is not prime

STEP 2

Circle 2, since it is prime. Cross out all other multiples of 2.

STEP 3

Circle the next number that is not crossed out. This number is prime. Cross out all the multiples of this number.

STEP 4

Repeat Step 3 until every number is either circled or crossed out.

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
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

So, the prime numbers less than 100 are

_____

_____

_____

_____

_____

_____

_____

21. **Explain** why the multiples of any number other than 1 are not prime numbers.

_____

FOR MORE PRACTICE:
Standards Practice Book, pp. P105–P106

Name _____

Number Patterns

Essential Question How can you make and describe patterns?

UNLOCK the Problem REAL WORLD

Daryl is making a pattern for a quilt. The pattern shows 40 squares. Every fourth square is blue. How many blue squares are in the pattern?

- Underline what you are asked to find.
- Circle what you need to use.

A **pattern** is an ordered set of numbers or objects. Each number or object in the pattern is called a **term**.

Activity Find a pattern.

Materials ■ color pencils

Shade the squares that are blue.

	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	
	31	32	33	34	35	36	37	38	39	40	

MATHEMATICAL PRACTICES

Math Talk **Describe** another number pattern in Daryl's quilt.

Which squares are blue? _____

So, there are _____ blue squares in the pattern.

1. What patterns do you see in the arrangement of the blue squares?

_____

_____

2. What patterns do you see in the numbers of the blue squares?

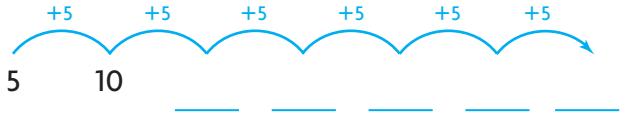
_____

_____

Example Find and describe a pattern.

The rule for the pattern is *add* 5. The first term in the pattern is 5.

A **Use the rule to write the numbers in the pattern.**



5, 10, _____, _____, _____, _____, _____, _____, _____, …

B **Describe other patterns in the numbers.**

What do you notice about the digits in the ones place?

_____

_____

Describe the pattern using the words *odd* and *even*.

_____

_____

Describe the pattern using the word *multiples*.

_____

_____

Try This! Find and describe a pattern.

The rule for the pattern is *add* 3, *subtract* 1. The first term in the pattern is 6.

Describe another pattern in the numbers.

_____

_____

_____

Name _____

Share and Show

MATH BOARD

Use the rule to write the numbers in the pattern.

1. Rule: Subtract 10. First term: 100

Think Subtract 10

100 ____ ____ ____ ____

100, _____, _____, _____, _____, …

MATHEMATICAL PRACTICES

Math Talk **Explain** how the first term in a pattern helps you find the next term.

Use the rule to write the numbers in the pattern. Describe another pattern in the numbers.

2. Rule: Multiply by 2. First term: 4

4, _____, _____, _____, _____, …

_____

3. Rule: Skip-count by 6. First term: 12

12, _____, _____, _____, _____, …

_____

On Your Own

Use the rule to write the first twelve numbers in the pattern. Describe another pattern in the numbers.

4. Rule: Add 7. First term: 3

_____

_____

5. Rule: Subtract 5. First term: 94

_____

_____

6. Rule: Subtract 2, add 3. First term: 6

_____

_____

7. Rule: Add 2, add 1. First term: 12

_____

_____

Problem Solving REAL WORLD

8. The odd- and even-numbered hotel rooms are on different sides of the hall. Room 231 is between which two rooms?

9. **Test Prep** Which pattern follows the rule *add* 3, *subtract* 1?

   Ⓐ 60, 63, 60, 63, …

   Ⓑ 3, 1, 4, 2, …

   Ⓒ 60, 63, 62, 65, …

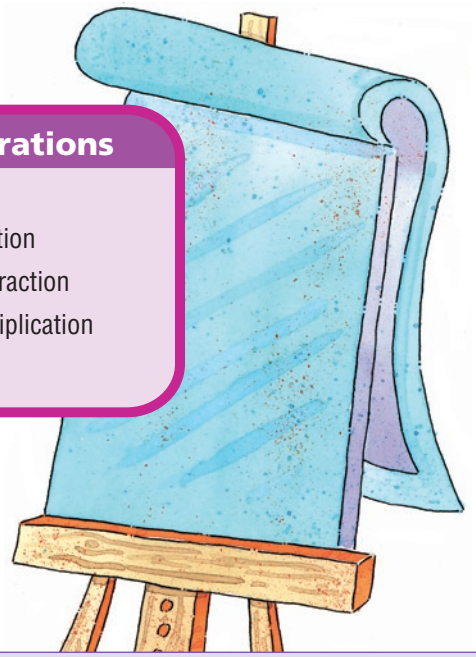
   Ⓓ 60, 63, 66, 69, …

Pose a Problem

10. H.O.T. An activity at the Math Fair shows two charts.

Numbers
2
3
5
6
10

Operations
addition
subtraction
multiplication



Use at least two of the numbers and an operation from the charts to write a pattern problem. Include the first five terms of your pattern in the solution to your problem.

Pose a problem.	Solve your problem.

- **Describe** other patterns in the terms you wrote.

Name _____

Chapter Review/Test

Vocabulary

Choose the best term from the box.

Vocabulary
composite number
factor
multiple
prime number

1. The product of two numbers is a _____ of both numbers. (p. 207)
2. A _____ has exactly two factors. (p. 211)
3. A number is always a multiple of its _____. (p. 207)

Concepts and Skills

List all the factor pairs in the table.

4.

Factors of 48	
____ × ____ = ____	____, ____
____ × ____ = ____	____, ____
____ × ____ = ____	____, ____
____ × ____ = ____	____, ____
____ × ____ = ____	____, ____

5.

Factors of 81	
____ × ____ = ____	____, ____
____ × ____ = ____	____, ____
____ × ____ = ____	____, ____

Is the number a multiple of 9? Write *yes* or *no*.

6. 3 _____ 7. 39 _____ 8. 45 _____ 9. 93 _____

Tell whether the number is *prime* or *composite*.

10. 65 _____ 11. 37 _____ 12. 77 _____

Use the rule to write the first twelve terms in the pattern. Describe another pattern in the numbers.

13. Rule: Add 10, subtract 5. _____

First term: 11 _____

GO Online Assessment Options Chapter Test

Fill in the bubble completely to show your answer.

14. Erica knits 18 squares on Monday. She knits 7 more squares each day for the rest of the week. How many squares does Erica have on Friday?

Ⓐ 36

Ⓑ 46

Ⓒ 54

Ⓓ 90

15. James works in a flower shop. He will put 36 tulips in vases for a wedding. He must use the same number of tulips in each vase. How many tulips could be in each vase?

Ⓐ 1, 2, 8

Ⓑ 2, 4, 8

Ⓒ 2, 4, 9

Ⓓ 6, 12, 16

16. What multiple of 7 is a factor of 7?

Ⓐ 0

Ⓑ 1

Ⓒ 7

Ⓓ 14

17. Hot dogs come in packages of 6. Hot dog buns come in packages of 8. Antonio will buy the same number of hot dogs as hot dog buns. How many hot dogs could he buy?

Ⓐ 6

Ⓑ 8

Ⓒ 18

Ⓓ 24

18. Sean has 54 flower bulbs. He planted all the bulbs in rows. Each row has the same number of bulbs. How many bulbs could be in each row?

Ⓐ 6 Ⓑ 8

Ⓒ 12 Ⓓ 26

Name _____

19. An ice-cream truck visits Julio's street every 3 days and Lara's street every 4 days. The truck visits both streets on April 12. When will the truck visit both streets next?

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					

Ⓐ April 15

Ⓑ April 16

Ⓒ April 19

Ⓓ April 24

20. The factors of a number include 2, 3, 4, 6, 8, 12, 16, 32, and 48. Which could be the number?

Ⓐ 32

Ⓑ 64

Ⓒ 96

Ⓓ 98

21. Ms. Booth has 16 red buttons and 24 blue buttons. She is making finger puppets. Each puppet has the same number of blue buttons and red buttons. How many puppets can she make if she uses all of the buttons?

Ⓐ 1, 2, 4, or 8

Ⓑ 1, 2, 4, 8, or 16

Ⓒ 1, 2, 4, 8, or 24

Ⓓ 1, 2, 4, 8, 16, or 24

Constructed Response

22. I am a number between 60 and 100. My ones digit is two less than my tens digit. I am a prime number. What number am I? Explain.

Performance Task

23. The number of pieces on display at an art museum is shown in the table.

Art	
Type of Art	**Number of pieces**
Oil paintings	30
Photographs	24
Sketches	21

A The museum's show for July features 30 oil paintings by different artists. All artists show the same number of paintings and each artist shows more than 1 painting. How many artists could be featured in the show?

B The museum wants to display all the art pieces in rows. Each row has the same number of pieces and the same type of pieces. How many pieces could be in each row?

C The museum alternates between adding 3 new pieces one month and retiring one piece the following month. If the museum starts with 75 pieces and the pattern continues, write the numbers in the pattern for the next 8 months. Describe other patterns in the numbers.