Model Factors

Use tiles to find all the factors of the product. **Check students' work.**
Record the arrays on grid paper and write the factors shown.

1. 15

$1 \times 15 = 15$

$3 \times 5 = 15$

1, 3, 5, 15

2. 30

**1, 2, 3, 5,
6, 10, 15, 30**

3. 45

**1, 3, 5, 9,
15, 45**

4. 19

1, 19

5. 40

**1, 2, 4, 5,
8, 10, 20
40**

6. 36

**1, 2, 3, 4,
6, 9, 12,
18, 36**

7. 22

**1, 2, 11,
22**

8. 4

1, 2, 4

9. 26

**1, 2, 13,
26**

10. 49

1, 7, 49

11. 32

**1, 2, 4, 8,
16, 32**

12. 23

1, 23

Problem Solving REAL WORLD

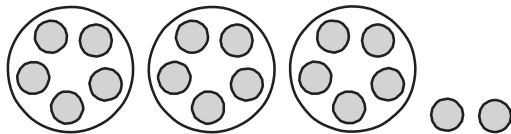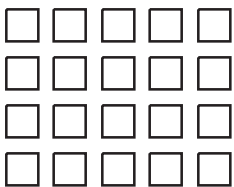**13.** Brooke has to set up 70 chairs in equal rows for the class talent show. But, there is not room for more than 20 rows. What are the possible number of rows that Brooke could set up?

**1, 2, 5, 7, 10, or
14 rows**

14. Eduardo thinks of a number between 1 and 20 that has exactly 5 factors. What number is he thinking of?

16

Lesson Check (CC.4.OA.4)

1. Which of the following lists all the factors of 24?

Ⓐ 1, 4, 6, 24

Ⓑ 1, 3, 8, 24

Ⓒ 3, 4, 6, 8

● 1, 2, 3, 4, 6, 8, 12, 24

2. Natalia has 48 tiles. Which of the following shows a factor pair for the number 48?

Ⓐ 4 and 8

● 6 and 8

Ⓒ 2 and 12

Ⓓ 3 and 24

Spiral Review (CC.4.OA.1, CC.4.NBT.5, CC.4.NBT.6)

3. The Pumpkin Patch is open every day. If it sells 2,750 pounds of pumpkins each day, about how many pounds does it sell in 7 days? **(Lesson 2.4)**

Ⓐ   210 pounds

Ⓑ   2,100 pounds

Ⓒ 14,000 pounds

● 21,000 pounds

4. What is the remainder in the division problem modeled below? **(Lesson 4.2)**

● 2   Ⓒ 5

Ⓑ 3   Ⓓ 17

5. Which number sentence is represented by the following array? **(Lesson 2.1)**

● 4 × 5 = 20

Ⓑ 4 × 4 = 16

Ⓒ 5 × 2 = 10

Ⓓ 5 × 5 = 25

6. Channing jogs 10 miles a week. How many miles will she jog in 52 weeks? **(Lesson 3.1)**

Ⓐ   30 miles

Ⓑ 120 miles

Ⓒ 200 miles

● 520 miles

Factors and Divisibility

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

1. 36

Think: $6 \times 6 = 36$

yes

2. 56

no

3. 42

yes

4. 66

yes

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

5. 38

no

6. 45

yes

7. 60

yes

8. 39

no

List all the factor pairs in the table.

9.

Factors of 12			
1 × **12** = **12**	**1**, **12**
2 × **6** = **12**	**2**, **6**
3 × **4** = **12**	**3**, **4**

10.

Factors of 25			
1 × **25** = **25**	**1**, **25**
5 × **5** = **25**	**5**, **5**

11. List all the factor pairs for 48. Make a table to help.
1 and 48, 2 and 24, 3 and 16, 4 and 12, 6 and 8

Problem Solving REAL WORLD

12. Bryson buys a bag of 64 plastic miniature dinosaurs. Could he distribute them equally into six storage containers and not have any left over? **Explain**.

No, 64 is not divisible by 6.

13. Lori wants to distribute 35 peaches equally into baskets. She will use more than 1 but fewer than 10 baskets. How many baskets does Lori need?

Lori needs 5 baskets or 7 baskets.

Lesson Check (CC.4.OA.4)

1. Which of the following numbers has 9 as a factor?

   Ⓐ 28

   Ⓑ 30

   Ⓒ 39

   ● 45

2. Which of the following numbers does NOT have 5 as a factor?

   Ⓐ 15

   ● 28

   Ⓒ 30

   Ⓓ 45

Spiral Review (CC.4.NBT.4, CC.4.NBT.5)

3. Which of the following shows a strategy to use to find 4×275? (Lesson 2.8)

   Ⓐ $(4 \times 300) + (4 \times 25)$

   ● $(4 \times 300) - (4 \times 25)$

   Ⓒ $(4 \times 275) - 100$

   Ⓓ $(4 \times 200) + 75$

4. Jack broke apart 5×216 as $(5 \times 200) + (5 \times 16)$ to multiply mentally. What strategy did Jack use? (Lesson 2.8)

   Ⓐ the Commutative Property

   Ⓑ the Associative Property

   Ⓒ halving and doubling

   ● the Distributive Property

5. Jordan has $55. She earns $67 by doing chores. How much money does Jordan have now? (Lesson 1.6)

   ● $122

   Ⓑ $130

   Ⓒ $112

   Ⓓ $12

6. Trina has 72 collector's stamps. She puts 43 of the stamps into a stamp book. How many stamps are left? (Lesson 1.7)

   ● 29

   Ⓑ 31

   Ⓒ 39

   Ⓓ 115

Problem Solving • Common Factors

PROBLEM SOLVING
Lesson 5.3

COMMON CORE STANDARD CC.4.OA.4
Gain familiarity with factors and multiples.

Solve each problem.

1. Grace is preparing grab bags for her store's open house. She has 24 candles, 16 pens, and 40 figurines. Each grab bag will have the same number of items, and all the items in a bag will be the same. How many items can Grace put in each bag?

   Find the common factors of 24, 16, and 40.

   1, 2, 4, or 8 items

2. Simon is making wreaths to sell. He has 60 bows, 36 silk roses, and 48 silk carnations. He wants to put the same number of items on each wreath. All the items on a wreath will be the same type. How many items can Simon put on each wreath?

   1, 2, 3, 4, 6, or 12 items

3. Justin has 20 pencils, 25 erasers, and 40 paper clips. He organizes them into groups with the same number of items in each group. All the items in a group will be the same type. How many items can he put in each group?

   1 or 5 items

4. A food bank has 50 cans of vegetables, 30 loaves of bread, and 100 bottles of water. The volunteers will put the items into boxes. Each box will have the same number of food items and all the items in the box will be the same type. How many items can they put in each box?

   1, 2, 5, or 10 items

5. A debate competition has participants from three different schools: 15 from James Elementary, 18 from George Washington School, and 12 from the MLK Jr. Academy. All teams must have the same number of students. Each team can have only students from the same school. How many students can be on each team?

   1 or 3 students

Lesson Check (CC.4.OA.4)

1. What are all the common factors of 24, 64, and 88?

Ⓐ 1 and 4

⬤ 1, 4, and 8

Ⓒ 1, 4, 8, and 12

Ⓓ 1, 4, 8, and 44

2. Which number is NOT a common factor of 15, 45, and 90?

Ⓐ 3

Ⓑ 5

⬤ 10

Ⓓ 15

Spiral Review (CC.4.NBT.5, CC.4.NBT.6)

3. Dan puts $11 of his allowance in his savings account every week. How much money will he have after 15 weeks? (Lesson 3.4)

⬤ $165

Ⓑ $132

Ⓒ $110

Ⓓ $26

4. James is reading a book that is 1,400 pages. He will read the same number of pages each day. If he reads the book in 7 days, how many pages will he read each day? (Lesson 4.4)

Ⓐ 20

Ⓑ 50

Ⓒ 140

⬤ 200

5. Emma volunteered at an animal shelter for a total of 119 hours over 6 weeks. Which is the best estimate of the number of hours she volunteered each week? (Lesson 4.5)

Ⓐ 10 hours

⬤ 20 hours

Ⓒ 120 hours

Ⓓ 714 hours

6. Which strategy can be used to multiply 6×198 mentally? (Lesson 2.8)

Ⓐ $6 \times 198 = (6 \times 19) + (6 \times 8)$

Ⓑ $6 \times 198 = (6 \times 200) + (6 \times 2)$

⬤ $6 \times 198 = (6 \times 200) - (6 \times 2)$

Ⓓ $6 \times 198 = (6 + 200) \times (6 + 2)$

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

____**yes**____

3. 20

____**no**____

4. 40

____**yes**____

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

5. Multiples of 4: 4, **8, 12, 16, 20, 24, 28, 32, 36, 40**

Multiples of 7: 7, **14, 21, 28, 35, 42, 49, 56, 63, 70**

Common multiples: **28**

6. Multiples of 3: 3, **6, 9, 12, 15, 18, 21, 24, 27, 30**

Multiples of 9: 9, **18, 27, 36, 45, 54, 63, 72, 81, 90**

Common multiples: **9, 18, 27**

7. Multiples of 6: 6, **12, 18, 24, 30, 36, 42, 48, 54, 60**

Multiples of 8: 8, **16, 24, 32, 40, 48, 56, 64, 72, 80**

Common multiples: **24, 48**

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

8. 6 ____**multiple**____

9. 36 ____**neither**____

10. 48 ____**factor**____

Problem Solving REAL WORLD

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

$3 and $9; $6 and $6

12. 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?

$24

Lesson Check (CC.4.OA.4)

1. Which list shows numbers that are all multiples of 4?

   (A) 2, 4, 6, 8

   (B) 3, 7, 11, 15, 19

   (C) 4, 14, 24, 34

   ● 4, 8, 12, 16

2. Which of the following numbers is a common multiple of 5 and 9?

   (A) 9

   (B) 14

   (C) 36

   ● 45

Spiral Review (CC.4.OA.3, CC.4.NBT.2, CC.4.NBT.4, CC.4.NBT.5)

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

   (Lesson 4.3)

   (A) 0

   (B) 1

   ● 2

   (D) 4

4. Jerome added two numbers. The sum was 83. One of the numbers was 45. What was the other number? (Lesson 1.7)

   ● 38

   (B) 48

   (C) 42

   (D) 128

5. There are 18 rows of seats in the auditorium. There are 24 seats in each row. How many seats are in the auditorium in all? (Lesson 3.5)

   (A) 42

   (B) 108

   (C) 412

   ● 432

6. The population of Riverdale is 6,735. What is the value of the 7 in the number 6,735? (Lesson 1.2)

   (A) 7

   ● 700

   (C) 735

   (D) 7,000

Prime and Composite Numbers

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

1. 47

Think: Does 47 have other factors besides 1 and itself?

__prime__

2. 68

__composite__

3. 52

__composite__

4. 63

__composite__

5. 75

__composite__

6. 31

__prime__

7. 77

__composite__

8. 59

__prime__

9. 87

__composite__

10. 72

__composite__

11. 49

__composite__

12. 73

__prime__

Problem Solving REAL WORLD

13. Kai wrote the number 85 on the board. Is 85 prime or composite? **Explain.**

85 is composite; its factors are 1, 5, 17, and 85.

14. Lisa says that 43 is a 2-digit odd number that is composite. Is she correct? **Explain.**

Lisa is not correct; 43 is prime; its only factors are 1 and 43.

Lesson Check (CC.4.OA.4)

1. The number 5 is:

- ● prime
- Ⓑ composite
- Ⓒ both prime and composite
- Ⓓ neither prime nor composite

2. The number 1 is:

- Ⓐ prime
- Ⓑ composite
- Ⓒ both prime and composite
- ● neither prime nor composite

Spiral Review (CC.4.OA.3, CC.4.NBT.2, CC.4.NBT.3, CC.4.NBT.6)

3. A recipe for a vegetable dish contains a total of 924 calories. The dish serves 6 people. How many calories are in each serving? (Lesson 4.10)

- Ⓐ 134 calories
- Ⓑ 150 calories
- ● 154 calories
- Ⓓ 231 calories

4. A store clerk has 45 shirts to pack in boxes. Each box holds 6 shirts. What is the fewest boxes the clerk will need to pack all the shirts? (Lesson 4.3)

- Ⓐ 9
- ● 8
- Ⓒ 7
- Ⓓ 6

5. Which number rounds to 200,000? (Lesson 1.4)

- Ⓐ 289,005
- Ⓑ 251,659
- ● 152,909
- Ⓓ 149,889

6. What is the word form of the number 602,107? (Lesson 1.2)

- Ⓐ six hundred twenty thousand, seventeen
- ● six hundred two thousand, one hundred seven
- Ⓒ six hundred twenty-one thousand, seventeen
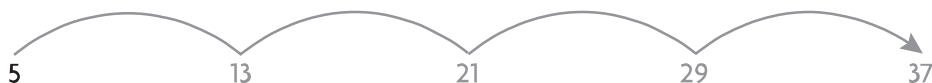- Ⓓ six hundred two thousand, one hundred seventy

Number Patterns

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

1. Rule: *Add 8.*   First term: 5

Think: Add 8.

5 —— 13 —— 21 —— 29 —— 37

5, 13, 21, 29, 37, 45, 53, 61, 69, 77, 85, 93

All the terms are odd numbers.

2. Rule: *Subtract 7.*   First term: 95

95, 88, 81, 74, 67, 60, 53, 46, 39, 32, 25, 18; Possible answer: numbers alternate between odd and even.

3. Rule: *Add 15, subtract 10.*   First term: 4

4, 19, 9, 24, 14, 29, 19, 34, 24, 39, 29, 44
Possible answer: the ones digit is either 4 or 9.

4. Rule: *Add 1, multiply by 2.*   First term: 2

2, 3, 6, 7, 14, 15, 30, 31, 62, 63, 126, 127
Possible answer: the terms alternate between even and odd.

Problem Solving REAL WORLD

5. Barb is making a bead necklace. She strings 1 white bead, then 3 blue beads, then 1 white bead, and so on. Write the numbers for the first eight beads that are white. What is the rule for the pattern?

1, 5, 9, 13, 17, 21, 25, 29; add 4

6. An artist is arranging tiles in rows to decorate a wall. Each new row has 2 fewer tiles than the row below it. If the first row has 23 tiles, how many tiles will be in the seventh row?

11 tiles

Lesson Check (CC.4.OA.5)

1. The rule for a pattern is *add 6*. The first term is 5. Which of the following numbers is a term in the pattern?

Ⓐ 6

Ⓑ 12

⬤ 17

Ⓓ 22

2. What are the next two terms in the pattern 3, 6, 5, 10, 9, 18, 17, . . .?

Ⓐ 16, 15

Ⓑ 30, 31

Ⓒ 33, 34

⬤ 34, 33

Spiral Review (CC.4.OA.4, CC.4.NBT.4, CC.4.NBT.5)

3. To win a game, Roger needs to score 2,000 points. So far, he has scored 837 points. How many more points does Roger need to score? **(Lesson 1.7)**

⬤ 1,163 points

Ⓑ 1,173 points

Ⓒ 1,237 points

Ⓓ 2,837 points

4. Sue wants to use mental math to find 7×53. Which expression could she use? **(Lesson 2.5)**

Ⓐ $(7 \times 5) + 3$

Ⓑ $(7 \times 5) + (7 \times 3)$

Ⓒ $(7 \times 50) + 3$

⬤ $(7 \times 50) + (7 \times 3)$

5. Pat listed numbers that all have 15 as a multiple. Which of the following could be Pat's list? **(Lesson 5.4)**

⬤ 1, 3, 5, 15

Ⓑ 1, 5, 10, 15

Ⓒ 1, 15, 30, 45

Ⓓ 15, 115, 215

6. Which is a true statement about 7 and 14? **(Lesson 5.4)**

Ⓐ 7 is a multiple of 14.

Ⓑ 14 is a factor of 7.

⬤ 14 is a common multiple of 7 and 14.

Ⓓ 21 is a common multiple of 7 and 14.

Chapter 5 Extra Practice

Check students' work.

Lesson 5.1

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

1. 17

1, 17
_____

2. 42

1, 2, 3, 6, 7,
14, 21, 42

3. 28

1, 2, 4, 7,
14, 28

4. 50

1, 2, 5, 25,
50

Lesson 5.2

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

1. 35

yes

2. 56

no

3. 51

no

4. 40

yes

List all the factor pairs in the table.

5.

Factors of 16				
1 × **16** = **16**	**1** , **16**
2 × **8** = **16**	**2** , **8**
4 × **4** = **16**	**4** , **4**

6.

Factors of 49				
1 × **49** = **49**	**1** , **49**
7 × **7** = **49**	**7** , **7**

Lesson 5.3

Solve.

1. Hana is putting the fruit she bought into
bowls. She bought 8 melons, 12 pears,
and 24 apples. She puts the same number
of pieces of fruit in each bowl and puts
only one type of fruit in each bowl. How
many pieces can Hana put in each bowl?

1, 2, or 4 pieces

2. A store owner is arranging clothing on
racks. She has 30 sweaters, 45 shirts, and
15 pairs of jeans. She wants to put the
same number of items on each rack, with
only one type of item on each. How many
items can she put on a rack?

1, 3, 5, or 15 items

Lesson 5.4

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

1. 24

no

2. 18

yes

3. 27

yes

4. 42

no

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

5. Multiples of 4: 4, **8, 12, 16, 20, 24, 28, 32, 36, 40**

Multiples of 5: 5, **10, 15, 20, 25, 30, 35, 40, 45, 50**

Common multiples: **20, 40**

6. Multiples of 3: 3, **6, 9, 12, 15, 18, 21, 24, 27, 30**

Multiples of 6: 6, **12, 18, 24, 30, 36, 42, 48, 54, 60**

Common multiples: **6, 12, 18, 24, 30**

Lesson 5.5

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

1. 39

composite

2. 29

prime

3. 51

composite

Lesson 5.6

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

1. Rule: Add 6.   First term: 10

10, 16, 22, 28, 34, 40, 46, 52, 58, 64, 70, 76

Possible answer: all the terms are even numbers.

2. Rule: Add 3, subtract 2.   First term: 7

7, 10, 8, 11, 9, 12, 10, 13, 11, 14, 12, 15

Possible answer: after the first term, the terms alternate between two even numbers and two odd numbers.