

Dear Family,

Throughout the next few weeks, our math class will be working with factors, multiples, and patterns. The students will study and learn to find factors and multiples and work with number patterns.

Here is a sample of how your child will be taught.

## Vocabulary

**common factor** A number that is a factor of two or more numbers

**common multiple** A number that is a multiple of two or more numbers

**divisible** A number is divisible by another number if the quotient is a counting number and the remainder is zero.

**composite number** A whole number greater than 1 that has more than two factors

**prime number** A number that has exactly two factors: 1 and itself

## MODEL Find Factor Pairs

Use division to find all the factor pairs for 36. Divisibility rules can help.

Factors of 36	
$36 \div 1 = 36$	1, 36
$36 \div 2 = 18$	2, 18
$36 \div 3 = 12$	3, 12
$36 \div 6 = 6$	6, 6
$36 \div 9 = 4$	9, 4

### Divisibility Rules

- Every whole number is divisible by 1.
- The number is even. It's divisible by 2.
- The sum of the digits is divisible by 3.
- The number is even, and divisible by 3.
- The sum of the digits is divisible by 9.

### Tips

#### Divisibility

A whole number is divisible by another whole number when the quotient is a whole number and the remainder is 0.

## Activity

Using the divisibility rules, have your child find all the factor pairs for these numbers:

18, 48, 39, 63

# Carta para la casa

Querida familia,

Durante las próximas semanas, en la clase de matemáticas trabajaremos con factores, múltiplos y patrones. Aprenderemos a hallar factores y múltiplos y a trabajar con patrones de números.

Este es un ejemplo de la manera como aprenderemos.

## Vocabulario

**factor común** Un número que es factor de dos o más números

**común múltiplo** Un número que es múltiplo de dos o más números

**divisible** Un número es divisible entre otro número si el cociente es un número entero y el residuo es cero.

**número compuesto** Un número entero mayor que 1 que tiene más de dos factores

**número primo** Un número que tiene exactamente dos factores: 1 y él mismo

### **MODELO** Hallar pares de factores

Usa la división para hallar todos los pares de factores para 36. Las reglas de divisibilidad te pueden ayudar.

Factores de 36	
$36 \div 1 = 36$	1, 36
$36 \div 2 = 18$	2, 18
$36 \div 3 = 12$	3, 12
$36 \div 6 = 6$	6, 6
$36 \div 9 = 4$	9, 4

#### Reglas de divisibilidad

Todos los números enteros son divisibles entre 1.

El número es par. Es divisible entre 2.

La suma de los dígitos es divisible entre 3.

El número es par y divisible entre 3.

La suma de los dígitos es divisible entre 9.

#### Pistas

##### Divisibilidad

Un número entero es divisible entre otro número entero si el cociente es un número entero y el residuo es 0.

## Actividad

Usando las reglas de divisibilidad, pida a su niño o niña que halle todos los pares de factores para estos números: 18, 48, 39, 63.

Name \_\_\_\_\_

## Model Factors



**COMMON CORE STANDARD** MACC.4.OA.2.4

Gain familiarity with factors and multiples.

Use tiles to find all the factors of the product.

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

\_\_\_\_\_

\_\_\_\_\_

3. 45

\_\_\_\_\_

\_\_\_\_\_

4. 19

\_\_\_\_\_

\_\_\_\_\_

5. 40

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. 36

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

7. 22

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

8. 4

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

9. 26

\_\_\_\_\_

\_\_\_\_\_

10. 49

\_\_\_\_\_

\_\_\_\_\_

11. 32

\_\_\_\_\_

\_\_\_\_\_

12. 23

\_\_\_\_\_

\_\_\_\_\_

## Problem Solving



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?

\_\_\_\_\_

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

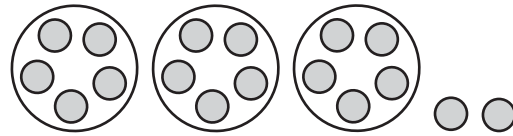
\_\_\_\_\_

**Lesson Check** (MACC.4.OA.2.4)

- Which of the following lists all the factors of 24?
  - (A) 1, 4, 6, 24
  - (B) 1, 3, 8, 24
  - (C) 3, 4, 6, 8
  - (D) 1, 2, 3, 4, 6, 8, 12, 24
- Natalia has 48 tiles. Which of the following shows a factor pair for the number 48?
  - (A) 4 and 8
  - (B) 6 and 8
  - (C) 2 and 12
  - (D) 3 and 24

**Spiral Review** (MACC.4.OA.1.1, MACC.4.NBT.2.5, MACC.4.NBT.2.6)

- 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)
- What is the remainder in the division problem modeled below? (Lesson 4.2)



- (A) 210 pounds
  - (B) 2,100 pounds
  - (C) 14,000 pounds
  - (D) 21,000 pounds
- (A) 2
  - (B) 3
  - (C) 5
  - (D) 17
- Which number sentence is represented by the following array? (Lesson 2.1)
- |   |   |   |   |   |
|---|---|---|---|---|
| □ | □ | □ | □ | □ |
| □ | □ | □ | □ | □ |
| □ | □ | □ | □ | □ |
| □ | □ | □ | □ | □ |
- (A)  $4 \times 5 = 20$
  - (B)  $4 \times 4 = 16$
  - (C)  $5 \times 2 = 10$
  - (D)  $5 \times 5 = 25$
- Channing jogs 10 miles a week. How many miles will she jog in 52 weeks? (Lesson 3.1)
- (A) 30 miles
  - (B) 120 miles
  - (C) 200 miles
  - (D) 520 miles

Name \_\_\_\_\_

## Factors and Divisibility



COMMON CORE STANDARD MACC.4.OA.2.4

Gain familiarity with factors and multiples.

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

1. 36

2. 56

3. 42

4. 66

Think:  $6 \times 6 = 36$

**yes**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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

5. 38

6. 45

7. 60

8. 39

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

List all the factor pairs in the table.

9.

Factors of 12	
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____

10.

Factors of 25	
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____

11. List all the factor pairs for 48. Make a table to help.

\_\_\_\_\_

\_\_\_\_\_

## Problem Solving



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.**

\_\_\_\_\_

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?

\_\_\_\_\_

### Lesson Check (MACC.4.OA.2.4)

- Which of the following numbers has 9 as a factor?
  - (A) 28
  - (B) 30
  - (C) 39
  - (D) 45
- Which of the following numbers does NOT have 5 as a factor?
  - (A) 15
  - (B) 28
  - (C) 30
  - (D) 45

### Spiral Review (MACC.4.NBT.2.4, MACC.4.NBT.2.5)

- Which of the following shows a strategy to use to find  $4 \times 275$ ? (Lesson 2.8)
  - (A)  $(4 \times 300) + (4 \times 25)$
  - (B)  $(4 \times 300) - (4 \times 25)$
  - (C)  $(4 \times 275) - 100$
  - (D)  $(4 \times 200) + 75$
- Jack broke apart  $5 \times 216$  as  $(5 \times 200) + (5 \times 16)$  to multiply mentally. What strategy did Jack use? (Lesson 2.8)
  - (A) the Commutative Property
  - (B) the Associative Property
  - (C) halving and doubling
  - (D) the Distributive Property
- Jordan has \$55. She earns \$67 by doing chores. How much money does Jordan have now? (Lesson 1.6)
  - (A) \$122
  - (B) \$130
  - (C) \$112
  - (D) \$12
- Trina has 72 collector's stamps. She puts 43 of the stamps into a stamp book. How many stamps are left? (Lesson 1.7)
  - (A) 29
  - (B) 31
  - (C) 39
  - (D) 115

Name \_\_\_\_\_

**Problem Solving • Common Factors**



**COMMON CORE STANDARD** MACC.4.OA.2.4

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?

\_\_\_\_\_

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?

\_\_\_\_\_

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?

\_\_\_\_\_

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?

\_\_\_\_\_

### Lesson Check (MACC.4.OA.2.4)

- 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
- Which number is NOT a common factor of 15, 45, and 90?
  - 3
  - 5
  - 10
  - 15

### Spiral Review (MACC.4.NBT.2.5, MACC.4.NBT.2.6)

- 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
- 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
- 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
- Which strategy can be used to multiply  $6 \times 198$  mentally? (Lesson 2.8)
  - $6 \times 198 = (6 \times 19) + (6 \times 8)$
  - $6 \times 198 = (6 \times 200) + (6 \times 2)$
  - $6 \times 198 = (6 \times 200) - (6 \times 2)$
  - $6 \times 198 = (6 + 200) \times (6 + 2)$



Name \_\_\_\_\_

**Factors and Multiples**

COMMON CORE STANDARD MACC.4.OA.2.4

Gain familiarity with factors and multiples.

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

1. 4

2. 8

3. 20

4. 40

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

**no**

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: \_\_\_\_\_

7. Multiples of 6: 6, \_\_\_\_\_

Multiples of 8: 8, \_\_\_\_\_

Common multiples: \_\_\_\_\_

Tell whether 24 is a factor or multiple of the number.

Write *factor*, *multiple*, or *neither*.

8. 6 \_\_\_\_\_

9. 36 \_\_\_\_\_

10. 48 \_\_\_\_\_

**Problem Solving**

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?

\_\_\_\_\_

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?

\_\_\_\_\_

### Lesson Check (MACC.4.OA.2.4)

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  
 (D) 4, 8, 12, 16
2. Which of the following numbers is a common multiple of 5 and 9?  
 (A) 9  
 (B) 14  
 (C) 36  
 (D) 45

### Spiral Review (MACC.4.OA.1.3, MACC.4.NBT.1.2, MACC.4.NBT.2.4, MACC.4.NBT.2.5)

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  
 (C) 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)  
 (A) 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  
 (D) 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  
 (B) 700  
 (C) 735  
 (D) 7,000

Name \_\_\_\_\_

## Prime and Composite Numbers



COMMON CORE STANDARD MACC.4.OA.2.4

Gain familiarity with factors and multiples.

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

1. 47

2. 68

3. 52

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

**prime**

4. 63

5. 75

6. 31

7. 77

8. 59

9. 87

10. 72

11. 49

12. 73

### Problem Solving



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

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

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Lesson Check (MACC.4.OA.2.4)

- The number 5 is:
  - prime
  - composite
  - both prime and composite
  - neither prime nor composite
- The number 1 is:
  - prime
  - composite
  - both prime and composite
  - neither prime nor composite

## Spiral Review (MACC.4.OA.1.3, MACC.4.NBT.1.2, MACC.4.NBT.1.3, MACC.4.NBT.2.6)

- 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
- 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
- Which number rounds to 200,000? (Lesson 1.4)
  - 289,005
  - 251,659
  - 152,909
  - 149,889
- 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

Name \_\_\_\_\_

**Number Patterns**



**COMMON CORE STANDARD** MACC.4.OA.3.5

Generate and analyze 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, 45, 53, 61, 69, 77, 85, 93**

**All the terms are odd numbers.**

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

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

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

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**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?
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?

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### Lesson Check (MACC.4.OA.3.5)

- The rule for a pattern is *add 6*. The first term is 5. Which of the following numbers is a term in the pattern?
  - (A) 6
  - (B) 12
  - (C) 17
  - (D) 22
- What are the next two terms in the pattern 3, 6, 5, 10, 9, 18, 17, ...?
  - (A) 16, 15
  - (B) 30, 31
  - (C) 33, 34
  - (D) 34, 33

### Spiral Review (MACC.4.OA.2.4, MACC.4.NBT.2.4, MACC.4.NBT.2.5)

- 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)
  - (A) 1,163 points
  - (B) 1,173 points
  - (C) 1,237 points
  - (D) 2,837 points
- Sue wants to use mental math to find  $7 \times 53$ . Which expression could she use? (Lesson 2.5)
  - (A)  $(7 \times 5) + 3$
  - (B)  $(7 \times 5) + (7 \times 3)$
  - (C)  $(7 \times 50) + 3$
  - (D)  $(7 \times 50) + (7 \times 3)$
- Pat listed numbers that all have 15 as a multiple. Which of the following could be Pat's list? (Lesson 5.4)
  - (A) 1, 3, 5, 15
  - (B) 1, 5, 10, 15
  - (C) 1, 15, 30, 45
  - (D) 15, 115, 215
- Which is a true statement about 7 and 14? (Lesson 5.4)
  - (A) 7 is a multiple of 14.
  - (B) 14 is a factor of 7.
  - (C) 14 is a common multiple of 7 and 14.
  - (D) 21 is a common multiple of 7 and 14.

Name \_\_\_\_\_

## Chapter 5 Extra Practice

### 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

2. 42

3. 28

4. 50

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### Lesson 5.2

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

1. 35

2. 56

3. 51

4. 40

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List all the factor pairs in the table.

5.

Factors of 16	
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____

6.

Factors of 49	
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____

### Lesson 5.3

Solve.

- 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?

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- 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?

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## Lesson 5.4

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

1. 24

2. 18

3. 27

4. 42

\_\_\_\_\_

List the next nine multiples of each number.

Find the common multiples.

5. Multiples of 4: 4, \_\_\_\_\_

Multiples of 5: 5, \_\_\_\_\_

Common multiples: \_\_\_\_\_

6. Multiples of 3: 3, \_\_\_\_\_

Multiples of 6: 6, \_\_\_\_\_

Common multiples: \_\_\_\_\_

## Lesson 5.5

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

1. 39

2. 29

3. 51

\_\_\_\_\_

## 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

\_\_\_\_\_  
\_\_\_\_\_

2. Rule: Add 3, subtract 2.

First term: 7

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_