

Dear Family,

During the next few weeks, our math class will be learning about expressions and equations for all four operations. We will also learn how to find a rule for patterns and use that rule to extend the pattern. Students will be introduced to algebraic concepts by learning to use a variable to represent an unknown quantity in both expressions and equations.

You can expect to see homework that provides practice writing numerical and algebraic expressions and equations.

Here is a sample of how your child will be taught to write an algebraic expression.

### **MODEL** Algebraic Expressions

This is how we will be writing algebraic expressions.

Sandra has 8 apples. She gives some apples to Josh.

#### STEP 1

Choose a variable to represent the unknown quantity.

Let  $a$  represent the number of apples Sandra gave to Josh.

#### STEP 2

Decide what operation needs to be performed.

The apples Sandra gives away are *subtracted* from the apples she has.

#### STEP 3

Write the expression.

$$8 - a$$

### Tips

To model the algebraic expression, counters or other objects can be used. For example, eight counters can be placed on the table and then some counters, which represent the variable, can be taken away.

## Vocabulary

### algebraic expression

An expression that includes at least one variable

**equation** A number sentence which shows that two quantities are equal

**Distributive Property** The property that states that multiplying a sum by a number is the same as multiplying each addend by the number and then adding the products

**function** A relationship between two quantities in which one quantity depends uniquely on the other

### numerical expression

A mathematical phrase that uses only numbers and operation signs

**variable** A letter or symbol that stands for a number or numbers

# Carta para la casa

Querida familia,

Durante las próximas semanas, en la clase de matemáticas aprenderemos sobre las expresiones y ecuaciones para todas las cuatro operaciones. También aprenderemos cómo hallar una regla para un patrón y cómo usarla para extender dicho patrón. Estudiaremos los conceptos algebraicos y aprenderemos a usar una variable para representar una cantidad desconocida tanto en expresiones como en ecuaciones.

Llevaré a la casa tareas con actividades para practicar la escritura de expresiones numéricas y algebraicas, y las ecuaciones.

Llevaré a la casa con actividades a escribir expresiones algebraicas.

## Vocabulario

**expresión algebraica** Una expresión que contiene por lo menos una variable.

**ecuación** Un enunciado numérico que muestra que dos cantidades son iguales.

**propiedad distributiva** La propiedad que enuncia que multiplicar una suma por un número es lo mismo que mutiplicar cada sumando por ese número y luego sumar los totales.

**función** Una relación entre dos cantidades en la cual una depende de la otra.

**expresión numérica** Una frase matemática que tiene solo números y signos de operaciones.

**variable** Una letra o símbolo que representa uno o más números.

### **MODELO** Expresiones algebraicas

Así es como escribiremos expresiones algebraicas.

Sandra tiene 8 manzanas. Le da algunas manzanas a Josh.

**PASO 1**

Elige una variable para representar la cantidad desconocida.

Haz que  $m$  represente la cantidad de manzanas que Sandra le dio a Josh.

**PASO 2**

Decide qué operación se debe realizar.

Resta la cantidad de manzanas que Sandra entrega de la cantidad total de manzanas que tenía.

**PASO 3**

Escribe la expresión.

$$8 - m$$

**Pistas**

Para representar la expresión algebraica, se pueden usar fichas u otros objetos. Por ejemplo, se pueden colocar ocho fichas en la tabla y, para representar la variable, quitar luego algunas de ellas.

Name \_\_\_\_\_

**Multiplication Properties**

**MA.4.A.4.2** Describe mathematics relationships using expressions, equations, and visual representations.

Use the properties and mental math to find the product.

1.  $3 \times 6 \times 2$

2.  $8 \times 6 \times 0$

3.  $2 \times 7 \times 4$

4.  $4 \times 1 \times 3$

$3 \times (6 \times 2) =$

$3 \times (2 \times 6) =$

$(3 \times 2) \times 6 =$

$6 \times 6 = \underline{36}$

Find the missing number. Name the property used.

5.  $6 \times \square = 6$

6.  $4 \times 7 = \square \times 4$

7.  $5 \times \square = 0$

8.  $(6 \times 4) \times 2 = \square \times (4 \times 2)$

9.  $5 \times 8 = (5 \times 4) + (\square \times 4)$

10.  $1 \times \square = 9$

Show two ways to group by using parentheses. Find the product.

11.  $2 \times 3 \times 9 = \underline{\quad}$

12.  $8 \times 1 \times 4 = \underline{\quad}$

13.  $3 \times 7 \times 0 = \underline{\quad}$

## Problem Solving REAL WORLD

14. Two teams of 9 children gather to play baseball. Each child brings 1 glove. How many gloves are there in all?

\_\_\_\_\_

15. Cedric, Lauren, and Jay each bought 4 packs of trading cards. Each pack costs \$3. What did the three friends spend on cards all together?

\_\_\_\_\_

### Lesson Check (MA.4.A.4.2)

- Which of the following represents the Commutative Property of Multiplication?
  - (A)  $5 \times (4 \times 3) = (5 \times 4) \times 3$
  - (B)  $5 \times 1 = 5$
  - (C)  $5 \times 7 = 7 \times 5$
  - (D)  $5 \times 9 = (5 \times 6) + (5 \times 3)$
- Six friends meet to play a round of golf. Each brings 2 packs of golf balls. Each pack has 3 balls. How many golf balls do the friends have in all?
  - (F) 11
  - (G) 12
  - (H) 18
  - (I) 36

### Review Grade 4 (MA.4.A.1.1)

- Which is another way to write  $7 + 7 + 7 + 7 = 28$ ?
  - (A)  $28 \div 7 = 4$
  - (B)  $28 \div 4 = 7$
  - (C)  $4 + 7 = 11$
  - (D)  $7 \times 4 = 28$
- There are 3 rings on the circus floor. In each ring are 3 acrobats performing tricks. How many acrobats are on the circus floor in all?
  - (F) 3
  - (G) 6
  - (H) 9
  - (I) 12

← SPIRAL REVIEW

### Look Back (MA.3.A.1.2, MA.4.A.4.2)

- A recipe calls for 2 scoops of flour. If Carmen wants to double the recipe, which is the number of scoops Carmen will use?
  - (A) 3
  - (B) 4
  - (C) 6
  - (D) 8
- Caleb buys 3 bunches of bananas. There are 5 bananas in each bunch. How many bananas are in 3 groups of 5 bananas?
  - (F) 10
  - (G) 15
  - (H) 20
  - (I) 25

← SPIRAL REVIEW

Name \_\_\_\_\_

## Numerical Expressions



**MA.4.A.4.2** Describe mathematics relationships using expressions, equations, and visual representations.

Write an expression to match the words.

1. Ethan collected 16 seashells. He lost 4 of them while walking home.

$$16 - 4$$

\_\_\_\_\_

2. Yasmine bought 4 bracelets. Each bracelet cost \$3.

\_\_\_\_\_

3. Amani did 10 jumping jacks. Then she did 7 more.

\_\_\_\_\_

4. Darryl has a board that is 8 feet long. He cuts it into 2-foot long pieces.

\_\_\_\_\_

Write words to match the expression.

5.  $3 + (4 \times 12)$

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

6.  $36 \div 4$

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

7.  $24 - (6 + 3)$

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

Draw a line to match the expression with the words.

8. Ray picked 30 apples and put them equally into 3 baskets. Then he ate two of the apples in a basket.

$(3 \times 2) \times 30$

9. Quinn had \$30. She bought a notebook for \$3 and a pack of pens for \$2.

$(30 \div 3) - 2$

10. Colleen runs 3 miles twice a day for 30 days.

$30 - (3 + 2)$

## Problem Solving

11. Kylie has 14 polished stones. Her friend gives her 6 more stones. Write an expression that shows this situation.

\_\_\_\_\_

12. Rashad had 25 pieces of bubblegum. He shared them equally among himself and 4 friends. Then Rashad found 2 more pieces in his pocket. Write an expression that shows this situation.

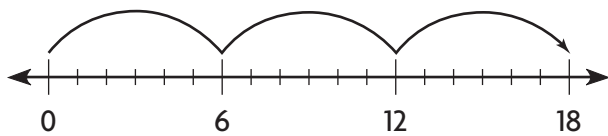
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### Lesson Check (MA.4.A.4.2)

- Jenna bought 3 packs of bottled water, with 8 bottles in each pack. Then she gave 6 bottles away. Which expression shows this situation?  
 (A)  $(3 + 8) + 6$       (C)  $(3 \times 8) + 6$   
 (B)  $(3 \times 8) \times 6$       (D)  $(3 \times 8) - 6$
- Stephen had 24 miniature cars. He gave 4 cars to his brother. Then he passed the rest of the cars out equally among four of his friends. Which operation would you perform first in this situation?  
 (F) +      (H)  $\div$   
 (G) -      (I)  $\times$

### Review Grade 4 (MA.4.A.1.1)

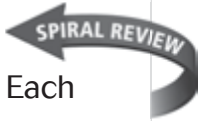
- Which number sentence does the model below represent?



- (A)  $3 \times 6 = 18$       (C)  $6 + 12 = 18$   
 (B)  $18 - 12 = 6$       (D)  $18 \div 3 = 6$

- There are 6 baskets on the table. Each basket has 8 apples in it. How many apples are there in all?

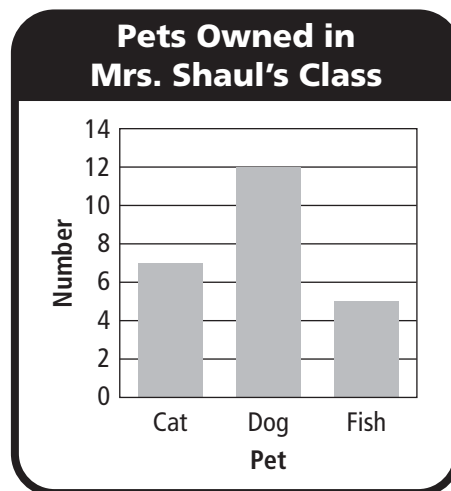
- (F) 6  
 (G) 8  
 (H) 14  
 (I) 48



### Look Back (MA.3.A.4.1, MA.4.A.4.2)

- The graph shows the number of pets owned by students in Mrs. Shaul's class. Which of the following expressions shows the number of cats and dogs owned?

- (A)  $12 - 7$   
 (B)  $7 + 12$   
 (C)  $5 + 7 + 12$   
 (D)  $7 \times 12$



Name \_\_\_\_\_

## Algebraic Expressions



**MA.4.A.4.2** Describe mathematics relationships using expressions, equations, and visual representations.

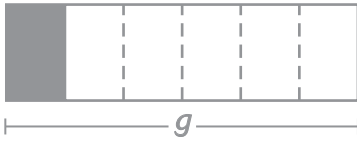
Model each expression.

1.  $g \div 6$

2.  $15 - k$

3.  $5 \times a$

4.  $w + 9$



Model and write an expression that matches the words.

Describe what the expression represents.

5. a number of ice cube trays,  $t$ , with 8 ice cubes in each tray

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6. a bunch of cookies,  $c$ , taken from a jar that held 30 cookies

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7. a pile of pennies,  $p$ , divided into 5 groups

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8. a number of nails,  $n$ , added to 6 nails already hammered into a board

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## Problem Solving

9. A hotel has a number of rooms,  $r$ . It has the same number of rooms on each of its 4 floors. Write an expression to show the number of rooms on each floor.

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10. Gretchen had a number of postcards,  $p$ , in her collection. She gets 11 more postcards from her friends this summer. Write an expression to show the total number of postcards Gretchen has now.

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### Lesson Check (MA.4.A.4.2)

- There are a number of ducks,  $d$ , in a pond. Seven more ducks enter the pond. Which expression represents the total number of ducks in the pond?
 

(A)  $d \times 7$                        (C)  $d + 7$   
 (B)  $d + d$                          (D)  $d - 7$
- Olivia plants a number of flowers,  $f$ , into each of 8 pots. Which expression shows the total number of flowers Olivia planted?
 

(F)  $f + 8$                                (H)  $8 \div f$   
 (G)  $f - 8$                                (I)  $f \times 8$

### Review Grade 4 (MA.4.A.1.1)

- Nicholas stacks 28 books into 4 equal piles. How many books are in each pile?
 

(A) 6                                       (C) 8  
 (B) 7                                       (D) 9
- A muffin costs \$2. How much do 7 muffins cost in all?
 

(F) \$7                                       (H) \$14  
 (G) \$9                                       (I) \$16



SPIRAL REVIEW

### Look Back (MA.3.A.4.1, MA.4.A.4.2)

- Cynthia has 6 crackers and her mother gives her some more. This situation is represented by the expression  $6 + \blacklozenge$ . What does the  $\blacklozenge$  represent in this expression?
 

(A) the total number of crackers  
 (B) the number of cracker's Cynthia's mother gave her  
 (C) the number of crackers Cynthia had to start with  
 (D) the number of crackers left after Cynthia ate some
- Noah decides to save some money using the following pattern. On Day 1 he saves 3 pennies. On Day 2 he saves 4 pennies. On Day 3 he saves 5 pennies. If  $n$  represents the number of the day, which expression shows how many pennies are saved on any given day?
 

(F)  $n + 1$   
 (G)  $n + 2$   
 (H)  $n \times 3$   
 (I)  $n - 2$



SPIRAL REVIEW



Name \_\_\_\_\_

## Algebraic Expressions with Two Operations



MA.4.A.4.2 Describe mathematics relationships using expressions, equations, and visual representations.

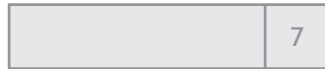
Model each expression.

1.  $(m \times 4) + 7$

Action 1



Action 2



2.  $(t \div 2) - 4$

Action 1

Action 2

3.  $(p - 9) + 6$

Action 1

Action 2

4.  $(w + 3) \div 5$

Action 1

Action 2

Write an expression that matches the words. Describe what the expression represents.

5. \$16 added to an amount of money saved,  $s$ , then spent equally on 3 items

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6. the same number of birds,  $b$ , sitting on three different wires, then 9 birds fly off

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### Problem Solving

7. Pat had \$3. He gets some money from his parents. He now has twice as much money as Dani. Write an expression to represent how much money Dani has. Tell what the variable represents.

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8. Bianca is 4 years younger than 3 times Marcos's age,  $m$ . Write an expression to represent Bianca's age. Tell what the variable represents.

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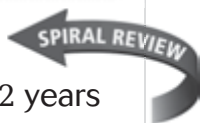
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### Lesson Check (MA.4.A.4.2)

- There are 8 sandwiches on a platter. Some of the sandwiches,  $s$ , are eaten. Then Kelsey puts 6 more sandwiches on the platter. Which expression shows this situation?  
 (A)  $(6 - s) + 8$       (C)  $(s - 8) + 6$   
 (B)  $(s + 8) - 6$       (D)  $(8 - s) + 6$
- James has a collection of trading cards,  $c$ . He puts the cards equally into 9 pages of an album. Then he decides to remove 3 cards from each page. Which expression shows the number of cards on each page of James's album?  
 (F)  $(c \div 9) - 3$       (H)  $(c \div 9) + 3$   
 (G)  $(9 \div c) - 3$       (I)  $(c \times 9) - 3$

### Review Grade 4 (MA.4.A.1.1)

- Which of the following is in the same fact family as the fact  $8 \times 3 = 24$ ?  
 (A)  $4 \times 6 = 24$   
 (B)  $8 \times 4 = 32$   
 (C)  $24 \div 3 = 8$   
 (D)  $8 + 3 = 11$
- Ryan is 7 years old. His father is 42 years old. Which of the following could be used to find how many times as old as Ryan his father is?  
 (F)  $42 \times 7$       (H)  $42 - 7$   
 (G)  $42 \div 7$       (I)  $7 + 42$



### Look Back (MA.3.A.4.1, MA.4.A.4.2)

- Logan builds different towers out of blocks. The table shows the number of blocks in each tower.

Tower	Number of Blocks
1	5
2	6
3	7
4	8

Which expression describes how many blocks are in the 6th tower if Logan continues the pattern?

- (A)  $6 + 1$       (C)  $6 + 4$   
 (B)  $6 - 4$       (D)  $6 \times 2$

- Which of the following can be represented by the expression  $12 \div 4$ ?  
 (F) 12 orange slices shared among 4 friends  
 (G) 4 oranges cut into 12 slices  
 (H) Chloe had 12 oranges and gave 4 away  
 (I) 12 oranges in each of 4 groups



Name \_\_\_\_\_

**Number Patterns**

**MA.4.A.4.1** Generate algebraic rules and use all four operations to describe patterns, including nonnumeric growing or repeating patterns.

Describe a pattern. Then find the next two numbers in your pattern.

1. 8, 16, 4, 8, 2, 4, 1

multiply by 2, divide  
by 4

2. 325, 310, 295, 280, \_\_\_\_\_, \_\_\_\_\_

3. 3, 11, 19, 27, \_\_\_\_\_, \_\_\_\_\_

4. 45, 55, 50, 60, 55, \_\_\_\_\_, \_\_\_\_\_

Use the description to make a number pattern. Write the first four numbers in the pattern.

5. Add 7.

Start with 15.

\_\_\_\_\_

6. Divide by 3.

Start with 27.

\_\_\_\_\_

7. Subtract 8; add 4.

Start with 88.

\_\_\_\_\_

8. Add 2; multiply by 2.

Start with 7.

\_\_\_\_\_

## Problem Solving

9. Mario counts as he jumps rope. He crosses the rope in front of himself on the count of 8, 16, and 24. If he continues the pattern, what numbers will he count the next two times he crosses the rope in front of himself?

\_\_\_\_\_

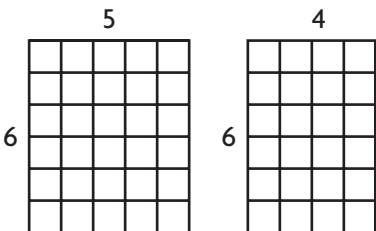
10. Abby takes 6 steps forward, then 2 steps back. If she repeats this pattern, how many steps will she be from where she started after 4 moves? After 5 moves?

\_\_\_\_\_

## Lesson Check (MA.4.A.4.1)

- Which of the following could describe this pattern?  
28, 34, 40, 46, 52  
 (A) Subtract 6.  
 (B) Add 6.  
 (C) Add 8.  
 (D) Multiply by 6.
- Given the description below, which of the following are the first 4 numbers in the number pattern?  
Subtract 5, add 2.  
Start with 15.  
 (F) 15, 10, 8, 3    (H) 15, 10, 12, 7  
 (G) 15, 17, 12, 14    (I) 15, 10, 5, 0

## Review Grade 4 (MA.4.A.1.1)

- Austin draws the following model on grid paper to find the product of  $6 \times 9$ .  

- Which of the following demonstrates use of the doubles strategy to find the product of  $8 \times 6$ ?  
 (F)  $(2 \times 8) + (2 \times 6)$   
 (G)  $(8 \times 3) + (8 \times 3)$   
 (H)  $2 \times (8 + 6)$   
 (I)  $(8 + 3) \times (8 + 3)$



## Look Back (MA.3.A.4.1, MA.4.A.4.1)

- Which of the following describes this pattern?  
10, 8, 6, 4, 2  
 (A) Add 2.                      (C) Divide by 2.  
 (B) Subtract 2.                (D) Multiply by 2.
- Which might be the next number in the pattern below?  
3, 6, 9, 12, \_\_\_\_\_  
 (F) 13                              (H) 15  
 (G) 14                              (I) 16



Name \_\_\_\_\_

## Patterns: Find a Rule



MA.4.A.4.3 Recognize and write algebraic expressions for functions with two operations.

Find a rule. Write your rule as an expression.  
Use your rule to find the missing numbers.

1. Rule: divide  $m$  by 3

Input	$m$	3	6	9	12	15	18	21
Output	$n$	1	2	3	4	5	6	7

Expression:  $m \div 3$

2. Rule: \_\_\_\_\_

Input	$x$	1	2	3	4	5	6	7
Output	$y$	5	9	13	17			

Expression: \_\_\_\_\_

3. Rule: \_\_\_\_\_

Input	$s$	18	20	22	24			
Output	$t$	9	11	13	15	17	19	21

Expression: \_\_\_\_\_

Use the rule to make an input/output table.

4. Multiply  $p$  by 6.

$$p \times 6$$

5. Add 3 to  $b$ , then multiply by 2.

$$(b + 3) \times 2$$

## Problem Solving REAL WORLD

Use the table below to for Exercise 6.

Vehicle	Number of Wheels
Unicycle	1
Bicycle	2
Tricycle	3
Car	4

6. How many wheels would there be in all for 5, 6, 7, and 8 tricycles? Complete the input/output table. Write a rule to solve.

Input	$t$	5	6	7	8
Output	$w$				

## Lesson Check (MA.4.A.4.3)

1. Which rule works for the table below?

Input	$x$	2	4	6	8
Output	$y$	1	2	3	4

- Ⓐ Subtract 1 from  $x$ .      Ⓒ Add 1 to  $y$ .  
 Ⓑ Multiply  $x$  by 2.      Ⓓ Divide  $x$  by 2.

2. Gwen uses the rule  $3x - 1$  to start an input/output table. Which numbers will complete the table?

Input	$x$	3	4	5	6
Output	$y$	8	11		

- Ⓕ 13 and 15      Ⓗ 15 and 18  
 Ⓖ 14 and 17      Ⓘ 16 and 19

## Review Grade 4 (MA.4.A.1.1)

3. In which two rows of the multiplication table would you find the product 21?

- Ⓐ rows 3 and 6      Ⓒ rows 3 and 7  
 Ⓑ rows 3 and 8      Ⓓ rows 4 and 7

4. Shira has 8 bracelets with 5 charms on each bracelet. How many charms does she have in all?

- Ⓕ 30      Ⓗ 40  
 Ⓖ 35      Ⓘ 45



## Look Back (MA.3.A.4.1, MA.4.A.4.3)

5. Which table follows the rule *add 4*?

Ⓐ

Input	$x$	1	2	3	4
Output	$y$	4	8	12	16

Ⓑ

Input	$x$	1	2	3	4
Output	$y$	5	6	7	8

Ⓒ

Input	$x$	1	2	3	4
Output	$y$	5	11	17	23

Ⓓ

Input	$x$	1	2	3	4
Output	$y$	4	5	6	7

6. In the problems below, the  $\blacklozenge$  stands for the same number.

$$\blacklozenge + \blacklozenge = 16$$

$$\blacklozenge \times \blacklozenge = 64$$

What is the value of the  $\blacklozenge$ ?

- Ⓕ 9  
 Ⓖ 8  
 Ⓗ 7  
 Ⓘ 6



Name \_\_\_\_\_

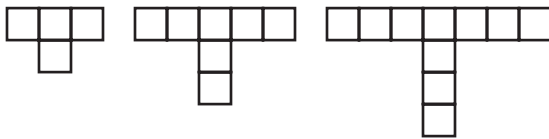
**Search for Patterns · Patterns**



**MA.4.A.4.1** Generate algebraic rules and use all four operations to describe patterns, including nonnumeric growing or repeating patterns.

**Solve.**

1. Christian made the following block pattern. How many blocks will be in the sixth figure of Christian’s pattern? What is a rule for the pattern?



**19 blocks;  
Possible answer:  
 $3n + 1$**

2. The table below shows the number of sugared flowers a cake decorator places around each layer of a cake. How many sugared flowers might he place around the 5th layer of a cake? What rule describes the number of sugared flowers around any layer?

<b>Layer</b>	<i>y</i>	1	2	3	4
<b>Flowers</b>	<i>f</i>	2	6	10	14

3. The first house on Main Street has the number 1. The second house has the number 3. The third house has the number 5. Ashley lives in the 9th house on Main Street. If this pattern continues, what is the number on Ashley’s house? What rule can be used to find the house number of any house on Main Street?

4. Nathan is placing tables end-to-end in a banquet hall. He can fit 8 chairs around one table, 14 chairs around 2 tables, and 20 chairs around 3 tables. How many chairs can Nathan fit around 7 tables? What rule can be used to find the number of chairs that will fit around any number of tables placed end-to-end?

## Lesson Check (MA.4.A.4.1)

1. The rule for the number of blocks in each row of a pyramid design that Sophia is building is to multiply the number of the row by itself, or  $n \times n$ . How many blocks would be in the 8th row of the pyramid?

- (A) 16
- (B) 36
- (C) 64
- (D) 80

2. Justin makes the table below to show the number of quarters he has saved each day for five days.

<b>Day</b>	<i>d</i>	1	2	3	4	5
<b>Quarters</b>	<i>q</i>	4	9	14	19	24

If he continues his pattern of saving, what might be the number of quarters Justin saves on Day 8?

- (F) 29
- (G) 32
- (H) 34
- (I) 39

## Review Grade 4 (MA.4.A.1.1)

3. When Mia finds the multiples of 2, which number would she NOT find in the ones place of any multiple?

- (A) 0
- (B) 2
- (C) 3
- (D) 8

4. Kevin has 36 stamps. He wants to arrange them in an array that has the same number of rows and columns. Which expression would represent his array?

- (F)  $4 \times 9$
- (G)  $6 \times 6$
- (H)  $8 \times 8$
- (I)  $9 \times 9$

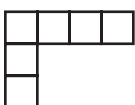
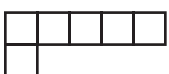
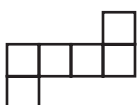



## Look Back (MA.3.A.4.1, MA.4.A.4.1)

5. Look at the pattern of figures below.



Which is most likely the next figure in the pattern?

- (A) 
- (B) 
- (C) 
- (D) 

6. Destiny created the pattern below using letters of the alphabet.

A, D, G, J, M

Which is likely to be the next letter in Destiny's pattern?

- (F) N
- (G) O
- (H) P
- (I) Q





Name \_\_\_\_\_

**Addition and Subtraction Equations**

**MA.4.A.4.2** Describe mathematics relationships using expressions, equations, and visual representations

Write an equation. Use  $+$ ,  $-$ , or  $=$ .

1. There are 20 children at the park. Some are girls,  $g$ , and 12 are boys.

$$20 \ominus g \oplus 12$$

2. Kaitlyn had \$9. She spent some money,  $m$ , on lunch. Now she has \$5.

$$\$9 \bigcirc m \bigcirc 5$$

3. There are some cats,  $c$ , on a fence. Three more cats join them, making 8 cats in all.

$$c \bigcirc 3 \bigcirc 8$$

4. Elijah has 16 pretzels left after eating a certain number,  $p$ , from 30 pretzels.

$$16 \bigcirc 30 \bigcirc p$$

Model and write an equation for the words. Choose a variable for the unknown. Tell what the variable represents.

5. Faye has \$8. She gets some more money for her allowance. Now she has \$15.

\_\_\_\_\_

6. Jordan has some markers. He passes out 5 markers. Now he has 19 markers.

\_\_\_\_\_

Write words to match the equation.

7.  $f + 7 = 16$

\_\_\_\_\_

\_\_\_\_\_

8.  $n - 11 = 4$

\_\_\_\_\_

\_\_\_\_\_

## Problem Solving

9. Savannah has some money saved,  $d$ . She buys a CD for \$15. Now she has \$25. Write an equation that shows this situation.

\_\_\_\_\_

10. Isaac has 6 model cars. He receives some more model cars,  $c$ , for his birthday. Now he has 11 model cars in all. Write an equation that shows this situation.

\_\_\_\_\_

### Lesson Check (MA.4.A.4.2)

- Luis has baseball practice for 60 minutes. The team warms up for 15 minutes. The rest of the time is spent playing a practice game. Which equation can be used to find the length of the practice game?
  - (A)  $60 + p = 15$
  - (B)  $15 + p = 60$
  - (C)  $15 - p = 60$
  - (D)  $p - 60 = 15$
- Which equation does the model below represent?
 

$e$	
20	8

- (F)  $20 + e = 8$
  - (G)  $e - 20 = 8$
  - (H)  $8 - e = 20$
  - (I)  $8 + e = 20$

### Review Grade 4 (MA.4.A.1.1)

- Adult tickets to the zoo cost 3 times as much as a child's ticket. Bao and her father spent \$36 on tickets to the zoo. How much does a child's ticket to the zoo cost?
  - (A) \$3
  - (B) \$9
  - (C) \$18
  - (D) \$27
- Diego saw 25 paintings at the museum. He saw 4 times as many oil paintings as watercolor paintings. How many oil paintings did he see?
  - (F) 5
  - (G) 15
  - (H) 20
  - (I) 25



### Look Back (MA.3.A.6.1, MA.4.A.4.1)

- Which addition sentence does the model below represent?
 

3	5
8	

- (A)  $2 + 6 = 8$
  - (B)  $4 + 4 = 8$
  - (C)  $3 + 5 = 8$
  - (D)  $1 + 7 = 8$
- Lily has \$15. She spends \$9 on a poster for her wall. How much money does Lily have left?
  - (F) \$24
  - (G) \$8
  - (H) \$7
  - (I) \$6



Name \_\_\_\_\_

## Multiplication and Division Equations



**MA.4.A.4.2** Describe mathematics relationships using expressions, equations, and visual representations.

Model and write an equation. Choose a variable for the unknown. Tell what the variable represents.

- An equal number of plates placed on each of 8 tables is 48 plates in all.
- Mary bought some used CDs for \$5 each. She spent a total of \$30.

$p$	$p$	$p$	$p$	$p$	$p$	$p$	$p$	$p$
48								

**$8 \times p = 48$ ;  $p$  is the number of plates on each table**

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- Jackson swims 8 laps a day for a certain number of days. He swims 56 laps in all.
- Zoe spent \$24 on some personalized mugs for her friends. Each mug cost \$6.

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Write words to match the equation. Then model the equation.

- $g \times 9 = 36$
- $35 \div b = 5$

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### Problem Solving

- Paige bought 3 pounds of almonds. She spent a total of \$18. Write an equation to find how much a pound of almonds costs.
- A pet store has 8 tanks. Each tank has 9 fish in it. Write an equation to find how many fish,  $f$ , the pet store has in all.

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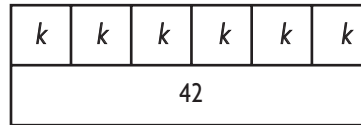
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## Lesson Check (MA.4.A.4.2)

1. Chang is 36 years old. This is 4 times as old as Vanessa's age. Which of the following can be used to find Vanessa's age,  $v$ ?

- (A)  $36 \times v = 4$
- (B)  $v \div 36 = 4$
- (C)  $4 \times v = 36$
- (D)  $36 \times v = 4$

2. Which equation does the model below represent?



- (F)  $42 \times k = 6$
- (G)  $6 \times k = 42$
- (H)  $k \div 42 = 6$
- (I)  $k \div 6 = 42$

← SPIRAL REVIEW

## Review Grade 4 (MA.4.A.1.1)

3. Carlos serves 24 slices of pie. Each pie was cut into 6 equal pieces. Which number sentence can be used to find the number of pies Carlos had?

- (A)  $\square \times 24 = 6$
- (B)  $\square \times 3 = 24$
- (C)  $\square \times 8 = 24$
- (D)  $\square \times 6 = 24$

4. What is the missing factor in the problem below?

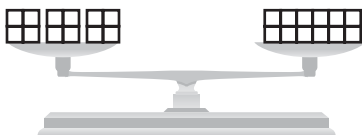
$$9 \times \square = 63$$

- (F) 5
- (G) 6
- (H) 7
- (I) 8

← SPIRAL REVIEW

## Look Back (MA.3.A.1.1, MA.4.A.4.2)

5. Which multiplication sentence is modeled by the balanced scale below?



- (A)  $3 \times 4 = 12$
- (B)  $12 \times 1 = 12$
- (C)  $2 \times 6 = 12$
- (D)  $6 \times 2 = 12$

6. Which shows another way to represent  $4 \times 5$ ?

- (F)  $10 + 10$
- (G)  $4 + 4 + 4 + 4$
- (H)  $5 + 5 + 5 + 5$
- (I)  $2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2$

Name \_\_\_\_\_

**Write an Equation**

**MA.4.A.4.2** Describe mathematics relationships using expressions, equations, and visual representations

Complete the equation. Use  $+$ ,  $-$ ,  $\times$ , or  $\div$  and  $=$ .

1. Owen has 7 red counters. The number of red counters is 4 more than the number of yellow counters,  $y$ .

$$7 \ominus 4 \oplus y$$

2. Farmer Brown has 2 cows in each of the dairy barn's stalls,  $s$ . There are 18 cows in the barn.

$$2 \bigcirc s \bigcirc 18$$

3. Sofia puts her stuffed animals,  $a$ , into 3 equal groups. There are 7 stuffed animals in each group.

$$a \bigcirc 3 \bigcirc 7$$

4. Kimani spent \$5 on her lunch today. This is \$2 less than what Dion,  $d$ , spent on his lunch.

$$\$5 \bigcirc d \bigcirc 2$$

Write the name of the operation you will use to write an equation.

Then write the equation.

5. A counselor separates 40 campers into equal groups for activities. There are 8 campers in each group,  $g$ .

\_\_\_\_\_

6. Autumn has 1 brother. This is 3 less than the number of brothers that Chase has,  $b$ .

\_\_\_\_\_

7. The art room has a box of crayons at each table, with 8 crayons in each box. There are 64 crayons in the art room.

\_\_\_\_\_

8. Leah has finished 12 math problems, which is 5 more math problems than Riley has finished,  $r$ .

\_\_\_\_\_

## Problem Solving

9. There were 72 visitors to a website in an hour. This is 14 more visitors than in the previous hour. Write an equation to find the number of visitors to the website in the previous hour.

\_\_\_\_\_

10. Cody has 6 times as many bottle caps in his collection as Rebecca. Cody has 36 bottle caps. Write an equation to find the number of bottle caps Rebecca has,  $c$ .

\_\_\_\_\_

## Lesson Check (MA.4.A.4.2)

1. In March, Outdoors Emporium sold 14 more bikes than kayaks. Nineteen bikes were sold in March.

$$14 \bigcirc k \bigcirc 19$$

Which symbols should be used in the circles above to determine the number of kayaks sold in March?

- (A)  $-$ ,  $=$   
 (B)  $=$ ,  $-$   
 (C)  $=$ ,  $+$   
 (D)  $+$ ,  $=$
2. Tess adds 16 drops of yellow food coloring to a batch of frosting. This is 4 times the number of drops of red food coloring she added. Which equation shows how to find the number,  $r$ , of drops of red food coloring Tess added?
- (F)  $16 + r = 4$   
 (G)  $16 = 4 \times r$   
 (H)  $r \div 4 = 16$   
 (I)  $16 \times r = 4$

## Review Grade 4 (MA.4.A.6.1)

3. What is  $300,000,000 + 4,000,000 + 80,000 + 2,000 + 600 + 90$  written in standard form?

- (A) 34,082,690  
 (B) 304,082,609  
 (C) 304,082,690  
 (D) 340,082,690

4. What is the value of the underlined digit in  $56\underline{7},837,127$ ?

- (F) 7  
 (G) 7,000  
 (H) 700,000  
 (I) 7,000,000



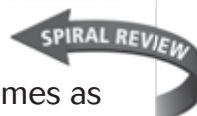
## Look Back (MA.3.A.1.2, MA.4.A.4.2)

5. Lexi has 12 eggs. She divides them into two groups. How many eggs are in each group?

- (A) 2  
 (B) 6  
 (C) 8  
 (D) 10

6. Shea is 3 years old. Tanner is 5 times as old as Shea. How old is Tanner?

- (F) 15 years  
 (G) 10 years  
 (H) 8 years  
 (I) 2 years



Name \_\_\_\_\_

## Chapter 3 Extra Practice

### Lesson 3.1 (pp. 81–84)

Use the properties and mental math to find the product.

1.  $1 \times 3 \times 2$

\_\_\_\_\_

2.  $6 \times 7 \times 0$

\_\_\_\_\_

3.  $4 \times 6 \times 2$

\_\_\_\_\_

4.  $2 \times 7 \times 3$

\_\_\_\_\_

Find the missing number. Name the property used.

5.  $6 \times 8 = (6 \times 4) + (6 \times \square)$

\_\_\_\_\_

6.  $(7 \times \square) = 7$

\_\_\_\_\_

7.  $6 \times 4 = \square \times 6$

\_\_\_\_\_

8.  $(2 \times 3) \times 6 = \square \times (3 \times 6)$

\_\_\_\_\_

Show two ways to group by using parentheses.

Find the product.

9.  $4 \times 7 \times 2 =$  \_\_\_\_\_

\_\_\_\_\_

10.  $9 \times 8 \times 1 =$  \_\_\_\_\_

\_\_\_\_\_

### Lesson 3.2 (pp. 85–88)

Write an expression to match the words.

1. Brett has a bookcase with 5 shelves. Each bookshelf holds 8 books.

\_\_\_\_\_

2. Jackie baked 24 cookies. She shared the cookies equally among 6 friends.

\_\_\_\_\_

3. Tessa ran 9 miles on Tuesday. She ran 13 more miles on Thursday.

\_\_\_\_\_

4. Jason has \$25. He spends \$13 on a basketball and \$4 on a basketball net.

\_\_\_\_\_

## Lesson 3.3 and 3.4 (pp. 89–96)

Model each expression.

1.  $t - 9$

2.  $26 + r$

Model and write an expression that matches the words.

Describe what the expression represents.

3. 3 times a number of apples,  $a$ , in a basket

4. 4 subtracted from some markers,  $m$ , then the remaining markers divided equally among 3 friends

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5. Gail keeps socks in several drawers. Each drawer has 4 pairs of socks. Then she throws away 2 pairs of socks. Write an expression for the number of pairs of socks that Gail has now. Tell what the variable represents.

6. Sal rents kayaks by the hour. He rents 12 kayaks. Then, he rents 6 more kayaks. Write an expression to represent how many kayaks Sal has left. Tell what the variable represents.

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## Lesson 3.5 (pp. 97-100)

Describe a pattern. Then find the next two numbers in your pattern.

1. 825, 675, 525, 375, \_\_\_\_\_, \_\_\_\_\_

2. 78, 85, 92, 99, 106, 113, 120, \_\_\_\_\_, \_\_\_\_\_

Use the description to make a number pattern. Write the first four numbers in the pattern.

3. Add 3.  
Start with 1

4. Multiply by 3.  
Start with 3

## Lesson 3.6 (pp. 101-104)

Find a rule. Write your rule as an expression. Use your rule to find the missing numbers.

1. Rule:

2. Rule:

Input	$x$	3	4	5	6
Output	$y$	15	20		

Input	$g$	4	5		
Output	$h$	18	22	26	30

Use the rule to make an input/output table.

3. Divide  $m$  by 3.  
 $m \div 3$

4. Add 5 to  $x$ , and then subtract 4.  
 $(x + 5) - 4$

Input					
Output					

Input					
Output					

## Lesson 3.7 and 3.8 (pp. 105–114)

Write an equation. Use +, −, or =.

1. Mr. Bell's classroom has 24 book bags in the hall. Some bags,  $b$ , are picked up, and now 5 are left.

$$24 \bigcirc b \bigcirc 5$$

2. Wendy puts 20 potatoes in a large bowl. Some potatoes are sweet potatoes,  $s$ , and 14 are not.

$$20 \bigcirc s \bigcirc 14$$

Model and write an equation for the words. Choose a variable for the unknown. Tell what the variable represents.

3. Kyle has some water bottles. He buys 3 more. Now Kyle has 9 water bottles.

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4. Lynne has \$40. She spends some money,  $m$ , on shoes. Now she has \$5 left.

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## Lesson 3.9 and 3.10 (pp. 115–122)

Write an equation. Choose a variable for the unknown. Tell what the variable represents.

1. The same number of pens in each of 5 boxes makes a total of 60 pens.

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2. The total number of books divided equally among 6 friends is 7.

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Write the name of the operation you will use to write an equation. Then write the equation.

3. Jack has 5 fewer dimes than Dan. If Dan has 8 dimes, how many dimes does Jack have?

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4. Meg has 12 pairs of shorts. She has 4 times as many shorts as her sister, Ellen. How many shorts does Ellen have,  $e$ ?

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