Chapter 10: Apply Multiplication and Division

Dear Family,

During the next few weeks, our math class will be learning strategies for finding multiples, determining even or odd numbers, finding unknown numbers, and solving two-step multiplication and division problems.

You can expect to see homework that provides practice with strategies for multiplying and dividing.

Kindly refer to the first six pages of the homework for definitions, rules, and examples related to multiples and divisibility.

Vocabulary

Expression: A part of an equation that has numbers and operation signs but does not have an equal sign.

Divisible: A number is divisible if the number is a counting number and can be evenly divided.

Multiple: When you multiply a number by a whole number, you get a multiple of that first number.

- Homework due date: Sunday, Feb. 2nd (Upload HW on **Archie**)
- Chapter 9 Test: Monday, Jan. 27th

- Feel free to contact me with any questions at diana.charaf@archimedean.org

Complete homework daily based on the schedule provided below:

Monday 01/27	pages: **457, 458**
Tuesday 01/28	pages: **463, 464**
Wednesday 01/29	pages: **469, 470**
Thursday 01/30	pages: **475, 476**
Friday 01/31	pages: **481, 482**

Multiples

What are multiples?

When you multiply a number by a whole number, you get a **multiple** of that first number.

For example, start with 3. If you multiply 3 by 4, you get 12. So, 12 is a multiple of 3.

The number 3 has many multiples. Let's find the first few.

3 × 1 = **3**
3 × 2 = **6**
3 × 3 = **9**
3 × 4 = **12**
3 × 5 = **15**

So, the first few multiples of 3 are **3**, **6**, **9**, **12**, and **15**!

Tips

1. Every whole number is a multiple of its factors. For example:

3 is a factor of **6**

6 is a multiple of **3**

2. When you start at a number and skip-count by that number, you are saying its multiples! Try it with 5. These are all multiples of 5:

5, 10, 15, 20, 25, …

Divisibility rules

What is divisibility?

If you can divide two numbers without a remainder, then the first number is **divisible** by the second.

For example, 12 is divisible by 2.

12 ÷ 2 = 6

But 12 is not divisible by 5. When you divide 12 by 5, you get a remainder.

12 ÷ 5 = 2 R2

💡 **Tip**

A number will always be divisible by its factors. Since 2 is a factor of 12, we know 12 is divisible by 2.

Divisibility rules

Divisibility rules can help you easily decide if a number is divisible by another number. This table shows some common divisibility rules.

2	A number is divisible by 2 if its ones digit is 0, 2, 4, 6, or 8.
3	A number is divisible by 3 if the sum of its digits is divisible by 3.
4	A number is divisible by 4 if the number formed by its last 2 digits is divisible by 4.
5	A number is divisible by 5 if its ones digit is 0 or 5.
6	A number is divisible by 6 if it is divisible by both 2 and 3.
8	A number is divisible by 8 if the number formed by its last 3 digits is divisible by 8.
9	A number is divisible by 9 if the sum of its digits is divisible by 9.
10	A number is divisible by 10 if its ones digit is 0.

Try it! See the examples below.

Divisibility by 2

A number is divisible by 2 if its ones digit is 0, 2, 4, 6, or 8.

Is 346 divisible by **2**?

- The ones digit in 346 is 6.
- So, 346 is divisible by 2.

Is 223 divisible by **2**?

- The ones digit in 223 is 3.
- So, 223 is not divisible by 2.

Divisibility by 3

A number is divisible by 3 if the sum of its digits is divisible by 3.

Is 324 divisible by **3**?

- Add the digits. 3 + 2 + 4 = 9
- Since 9 is divisible by 3, we know 324 is divisible by 3.

Is 412 divisible by **3**?

- Add the digits. 4 + 1 + 2 = 7

- Since 7 is not divisible by 3, we know 412 is not divisible by 3.

Divisibility by 4

A number is divisible by 4 if the number formed by its last 2 digits is divisible by 4.

Is 536 divisible by **4**?

- The last 2 digits of 536 form the number 36.

- Since 36 is divisible by 4, we know 536 is divisible by 4.

Is 247 divisible by **4**?

- The last 2 digits of 247 form the number 47.

- Since 47 is not divisible by 4, we know 247 is not divisible by 4.

Divisibility by 5

A number is divisible by 5 if its ones digit is 0 or 5.

Is 635 divisible by **5**?

- The ones digit in 635 is 5.

- So, 635 is divisible by 5.

Is 513 divisible by **5**?

- The ones digit in 513 is 3.

- So, 513 is not divisible by 5.

Divisibility by 6

A number is divisible by 6 if it is divisible by both 2 and 3.

Is 348 divisible by **6**?

- 348 is even, so it is divisible by 2.

- Add the digits. Since 3 + 4 + 8 = 15, it is divisible by 3.

- Since 348 is divisible by both 2 and 3, it is also divisible by 6.

Is 212 divisible by **6**?

- 212 is even, so it is divisible by 2.

- Add the digits. Since 2 + 1 + 2 = 5, it is not divisible by 3.

- So, 212 is not divisible by 6.

Divisibility by 8

A number is divisible by 8 if the number formed by its last 3 digits is divisible by 8.

Is 1,016 divisible by **8**?

- The last 3 digits form the number 016, or 16.

- 16 is divisible by 8, so 1,016 is divisible by 8.

Is 1,231 divisible by **8**?

- The last 3 digits form the number 231.

- 231 is not divisible by 8, so 1,231 is not divisible by 8.

Divisibility by 9

A number is divisible by 9 if the sum of its digits is divisible by 9.

Is 675 divisible by **9**?

- Add the digits. 6 + 7 + 5 = 18

- 18 is divisible by 9, so 675 is divisible by 9.

Is 364 divisible by **9**?

- Add the digits. 3 + 6 + 4 = 13

- 13 is not divisible by 9, so 364 is not divisible by 9.

Divisibility by 10

A number is divisible by 10 if its ones digit is 0.

Is 420 divisible by **10**?

- The ones digit in 420 is 0.
- So, 420 is divisible by 10.

Is 317 divisible by **10**?

- The ones digit in 317 is 7.
- So, 317 is not divisible by 10.

Multiplication Comparisons

Draw a bar model and write a multiplication expression to represent the comparison.

1. 4 times as many as 7

____

____ ____ ____ ____

_____

2. 5 times as many as 3

____

____ ____ ____ ____ ____

_____

Describe the multiplication expression as a comparison.

3. 7×6

_____ times as many as _____

4. 3×8

_____ times as many as _____

5. 8×5

_____ times as many as _____

6. 9×12

_____ times as many as _____

Problem Solving Real World

Use information in the pictures for Problems 7–9.

7. The toy store has 4 times as many whistles as yo-yos. Write a multiplication expression to represent the number of whistles compared to yo-yos.

_____

12 YO-YOs

3 TOPS

5 ducks

8. Write a comparison statement about the wind-up ducks that could be described using the expression 11×5.

_____

_____

9. The toy store has 8 times as many soccer balls as spinning tops. Write a multiplication expression to represent the number of soccer balls compared to spinning tops.

_____

Lesson Check

Fill in the bubble completely to show your answer.

10. Ela sells 5 boxes of greeting cards. Sam sells 3 times as many boxes as Ela. Which expression represents the number of boxes that Sam sells compared to Ela?

Ⓐ $5 \times 5 \times 5$

Ⓑ $5 + 3$

Ⓒ $5 - 3$

Ⓓ 3×5

11. Kaitlin collects 6 bottle caps for a prize. Jin collects 4 times as many bottle caps as Kaitlin. Which expression represents the number of bottle caps that Jin collects compared to Kaitlin?

Ⓐ $6 + 4$

Ⓑ $6 \times 6 \times 6 \times 6$

Ⓒ 4×6

Ⓓ $4 \times 4 \times 4 \times 4 \times 4 \times 4$

12. Farrah has 18 crayons. John's crayons can be represented by 2×18. Which comparison statement describes the expression?

Ⓐ 18 more than 2

Ⓑ 2 times as many as 18

Ⓒ 2 more than 18

Ⓓ 2 fewer than 18

13. Justin writes the multiplication expression 3×9. Which comparison statement describes the expression that Justin wrote?

Ⓐ 3 more than 9

Ⓑ 9 more than 3

Ⓒ 3 times as many as 9

Ⓓ 3 fewer than 9

Spiral Review

14. Donte has 3 math books and 5 science books. Ramya has 4 more books than Donte. How many books does Ramya have?

Ⓐ 12

Ⓑ 8

Ⓒ 4

Ⓓ 2

15. A scientist collected data on rainfall for 48 months. For how many years did she collect the data?

Ⓐ 12

Ⓑ 4

Ⓒ 3

Ⓓ 2

Identify, Create and Extend Patterns

Describe a pattern for the table. Then complete the table.

1.

Pans	1	2	3	4	5
Muffins	6	12	18	24	30

Add 6 muffins for each pan.

Multiply the number of pans by 6.

_____

2.

Wagons	2	3	4	5	6
Wheels	8	12	16		

_____

_____

_____

3.

Flowers	14	21	28	35	42
Vases	2		4		6

_____

_____

_____

4.

Spiders	1	2	3	4	5
Legs	8		24		40

_____

_____

_____

Problem Solving Real World

5. Caleb buys 5 cartons of yogurt. Each carton has 8 yogurt cups. How many yogurt cups does Caleb buy?

_____

6. Latoya bought 12 packages of pencils. Each package has 6 pencils. How many pencils did Latoya buy?

_____

Lesson Check

8. What is the fifth term in the pattern?

Tables	1	2	3	4	5
Chairs	5	10	15	20	■

_____

9. What number completes this table?

Butterflies	3	4	5	6	7
Wings	12	16	20	■	28

_____

Spiral Review

10. Jennilee buys 7 packs of crayons. There are 6 crayons in each pack. How many crayons does Jennilee buy?

_____

11. Maverick has 11 books of circus tickets. Each book has 5 tickets. How many tickets does Maverick have?

_____

12. Bailey walked his dog 2 times each day for 9 days. How many times did Bailey walk his dog?

_____

13. Drew's Tree Company delivers pear trees in groups of 4. Yesterday, the company delivered 8 groups of pear trees. How many pear trees were delivered?

_____

Determine Multiples

1. Which of the following are multiples of 7? Select all that apply.

   14   27   36   49

2. Which of the following are multiples of 3? Select all that apply.

   15   24   29   33

3. **MTR** There are 2 cups in a pint. Which containers hold whole numbers of pints? Show or explain how you found your answer.

   3 cups   8 cups   12 cups   15 cups

Find the first four multiples of the number. Write multiplication equations to show that they are multiples.

4. 12: _____

5. 9: _____

6. 1: _____

7. **MTR** Biscuits are sold in cans of 8. How many biscuits are in 1 to 5 cans?

8. Find the first 3 multiples of 6. Write division equations to show that they are multiples.

9. Karl says that 42 is a multiple of both 6 and 7. Is he correct? Explain.

Lesson Check

Fill in the bubble completely to show your answer.

10. Which number is a multiple of 7?

    (A) 17   (B) 24   (C) 36   (D) 49

11. Which number is not a multiple of 12?

    (A) 48   (B) 96   (C) 121   (D) 144

12. Which of the following are multiples of 2?

    (A) 8   (C) 29   (E) 55

    (B) 14   (D) 38

13. A toy robot requires 4 batteries. How many batteries are needed for 1 to 5 robots?

_____

Spiral Review

Find the sum.

14.
$$
\begin{array}{r} 4{,}325 \\ +\ 1{,}984 \\ \hline \end{array}
$$

15.
$$
\begin{array}{r} 2{,}907 \\ +\ 6{,}438 \\ \hline \end{array}
$$

Find the difference.

16.
$$
\begin{array}{r} 5{,}716 \\ -\ 3{,}940 \\ \hline \end{array}
$$

17.
$$
\begin{array}{r} 7{,}004 \\ -\ 6{,}928 \\ \hline \end{array}
$$

Determine Even or Odd Using Divisibility Rules

Tell if the product will be *odd* or *even*.

1. 3×41 _____

2. 56×9 _____

3. 64×8 _____

4. 3×50 _____

Circle the numbers divisible by 2.

5. 113   **6.** 572   **7.** 488   **8.** 326   **9.** 631   **10.** 234

Problem Solving Real World

11. Kenji writes the numbers 230 and 607. He says that both numbers are divisible by 2. Is Kenji correct? Explain.

_____

_____

12. Kara uses some buttons to decorate 6 puppets. She uses 8 buttons on each puppet. Will the number of buttons Kara uses be an even or an odd number? Explain.

_____

_____

_____

13. Miguel has a group of 17 red counters and a group of 13 yellow counters. He arranges the counters into stacks of 5. Does he have an odd or even number of stacks? Explain.

_____

_____

Lesson Check

Fill in the bubble completely to show your answer.

14. Dale tosses three number cubes shown below.

    Which is an even number Dale can make from the numbers?

    Ⓐ 536
    Ⓑ 635
    Ⓒ 563
    Ⓓ 365

15. Gerard tosses four number cubes shown below.

    Which set of numbers that Gerard makes are all odd?

    Ⓐ 216, 619, 926
    Ⓑ 169, 921, 269
    Ⓒ 692, 961, 219
    Ⓓ 926, 261, 692

16. A mystery number is odd and has 2 digits. The sum of the digits is 11. The digit in the tens place is between 0 and 3. What is the mystery number?

    Ⓐ 29
    Ⓑ 38
    Ⓒ 47
    Ⓓ 56

17. A mystery number is even and has 2 digits. The difference between the digits is 3. The digit in the ones place is between 0 and 4. What is the mystery number?

    Ⓐ 30
    Ⓑ 63
    Ⓒ 96
    Ⓓ 41

Spiral Review

Write the numbers in standard form.

18. four thousand, twenty-seven

    _____

19. five thousand, nine hundred two

    _____

20. six thousand, one

    _____

21. eight thousand, forty

    _____

Find Unknown Numbers

Find the unknown number.

1. $n \times 3 = 12$

Think: How many groups of 3 equal 12?

$n = \underline{\quad 4 \quad}$

2. $s \times 8 = 64$

$s = \underline{\qquad}$

3. $77 = 7 \times n$

$n = \underline{\qquad}$

4. $y \times 2 = 18$

$y = \underline{\qquad}$

5. $5 \times p = 60$

$p = \underline{\qquad}$

6. $56 = 8 \times t$

$t = \underline{\qquad}$

7. $m \times 4 = 28$

$m = \underline{\qquad}$

8. $\bigstar \times 1 = 9$

$\bigstar = \underline{\qquad}$

9. $b \times 6 = 54$

$b = \underline{\qquad}$

10. $5 \times \triangle = 40$

$\triangle = \underline{\qquad}$

11. $30 = d \times 3$

$d = \underline{\qquad}$

12. $7 \times k = 42$

$k = \underline{\qquad}$

Problem Solving · Real World

13. Carmen spent $42 for 6 hats. How much did each hat cost?

_____

14. Mark has a baking tray with 24 muffins. The muffins are arranged in 4 equal rows. How many muffins are in each row?
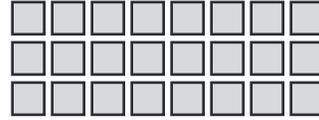
_____

15. **WRITE** ▸ *Math* Explain why it does not matter what letter or symbol is used to find an unknown number.

_____

_____

Lesson Check

16. What is the unknown number?

$$b \times 7 = 56$$

17. What is the unknown number shown by this array?

$$3 \times \blacksquare = 24$$

Spiral Review

18. The equation $4 \times 6 = 6 \times 4$ is an example of what property?

19. Find the product.

$$5 \times (4 \times 2)$$

20. The equation $4 \times 7 = (4 \times 3) + (4 \times 4)$ is an example of what property?

21. In a group of 10 children, each child had 2 hats. How many hats did they have?