



**LESSON 8**

**Place Value of Whole Numbers**

**OBJECTIVE** Read and write whole numbers through hundred millions.

You can use a place-value chart to help you understand whole numbers and the value of each digit. A **period** is a group of three digits within a number separated by a comma.

Millions Period			Thousands Period			Ones Period		
Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones
		2,	3	6	7,	0	8	9

**Standard Form:** 2,367,089

**Expanded Form:** Multiply each digit by its place value, and then write an addition expression.

$$(2 \times 1,000,000) + (3 \times 100,000) + (6 \times 10,000) + (7 \times 1,000) + (8 \times 10) + (9 \times 1)$$

**Word Form:** Write the number in words. Notice that the millions and the thousands periods are followed by the period name and a comma.

two million, three hundred sixty-seven thousand, eighty-nine

To find the value of an underlined digit, multiply the digit by its place value. In 2,367,089, the value of 2 is  $2 \times 1,000,000$ , or 2,000,000.

Write the value of the underlined digit.

1. 153,732,991

100,000,000

2. 236,143,802

30,000,000

3. 264,807

4,000

4. 78,209,146

200,000

Multiplying by Powers of 10  
\* shift decimal to the right

Write the number in two other forms.

5. 701,245

700 + 1,000 + 200 + 40 + 5

seven hundred one thousand, two hundred forty-five

$(7 \times 100,000) + (1 \times 1,000) + (2 \times 100) + (4 \times 10) + (5 \times 1)$

6. 40,023,032

40,000,000 + 20,000 + 30 + 2

fourty million, twenty-three thousand, thirty-two

$(4 \times 10,000,000) + (2 \times 10,000) + (3 \times 10) + (2 \times 1)$





## Algebra • Multiplication Patterns

Use mental math to complete the pattern.

1.  $8 \times 3 = 24$

$(8 \times 3) \times 10^1 = \underline{240}$

$(8 \times 3) \times 10^2 = \underline{2,400}$

$(8 \times 3) \times 10^3 = \underline{24,000}$

2.  $5 \times 6 = \underline{30}$

$(5 \times 6) \times 10^1 = \underline{300}$

$(5 \times 6) \times 10^2 = \underline{3,000}$

$(5 \times 6) \times 10^3 = \underline{30,000}$

3.  $3 \times \underline{9} = 27$

$(3 \times 9) \times 10^1 = \underline{270}$

$(3 \times 9) \times 10^2 = \underline{2,700}$

$(3 \times 9) \times 10^3 = \underline{27,000}$

4.  $\underline{7} \times 4 = 28$

$(7 \times 4) \times \underline{10^1} = 280$

$(7 \times 4) \times \underline{10^2} = 2,800$

$(7 \times 4) \times \underline{10^3} = 28,000$

5.  $6 \times 8 = \underline{48}$

$(6 \times 8) \times 10^2 = \underline{4,800}$

$(6 \times 8) \times 10^3 = \underline{48,000}$

$(6 \times 8) \times 10^4 = \underline{480,000}$

6.  $\underline{4} \times 4 = 16$

$(4 \times 4) \times 10^2 = \underline{1,600}$

$(4 \times 4) \times 10^3 = \underline{16,000}$

$(4 \times 4) \times 10^4 = \underline{160,000}$

Use mental math and a pattern to find the product.

7.  $(2 \times 9) \times 10^2$

$= \underline{1,800}$

8.  $(8 \times 7) \times 10^2$

$= \underline{5,600}$

9.  $(9 \times 6) \times 10^3$

$= \underline{54,000}$

10.  $(3 \times 7) \times 10^3$

$= \underline{21,000}$

11.  $(5 \times 9) \times 10^4$

$= \underline{450,000}$

12.  $(4 \times 8) \times 10^4$

$= \underline{480,000}$

13.  $(8 \times 8) \times 10^3$

$= \underline{64,000}$

14.  $(6 \times 4) \times 10^4$

$= \underline{240,000}$

15.  $(5 \times 5) \times 10^3$

$= \underline{25,000}$

### Problem Solving

16. The Florida Everglades welcomes about  $2 \times 10^3$  visitors per day. Based on this, about how many visitors come to the Everglades per week?

$\approx \underline{2,000}$  visitors

17. The average person loses about  $8 \times 10^1$  strands of hair each day. About how many strands of hair would the average person lose in 9 days?

About  $\underline{720}$  strands of hair

2 steps

1)  $8 \times 10^1 = 80$

2) 9 days  $80 \times 9 = 720$

Name \_\_\_\_\_

Dividing  $\rightarrow$  Think shift decimal left!

## Algebra • Division Patterns with Decimals

Complete the pattern.

1.  $78.3 \div 1 = \underline{78.3}$

$78.3 \div 10 = \underline{7.83}$

$78.3 \div 100 = \underline{0.783}$

2.  $179 \div 10^0 = \underline{179}$

$179 \div 10^1 = \underline{17.9}$

$179 \div 10^2 = \underline{1.79}$

$179 \div 10^3 = \underline{0.179}$

3.  $87.5 \div 10^0 = \underline{87.5}$

$87.5 \div 10^1 = \underline{8.75}$

$87.5 \div 10^2 = \underline{0.875}$

4.  $124 \div 1 = \underline{124}$

$124 \div 10 = \underline{12.4}$

$124 \div 100 = \underline{1.24}$

$124 \div 1,000 = \underline{0.124}$

5.  $18 \div 1 = \underline{18}$

$18 \div 10 = \underline{1.8}$

$18 \div 100 = \underline{0.18}$

$18 \div 1,000 = \underline{0.018}$

6.  $23 \div 10^0 = \underline{23}$

$23 \div 10^1 = \underline{2.3}$

$23 \div 10^2 = \underline{0.23}$

$23 \div 10^3 = \underline{0.023}$

7.  $51.8 \div 1 = \underline{51.8}$

$51.8 \div 10 = \underline{5.18}$

$51.8 \div 100 = \underline{0.518}$

8.  $49.3 \div 10^0 = \underline{49.3}$

$49.3 \div 10^1 = \underline{4.93}$

$49.3 \div 10^2 = \underline{0.493}$

9.  $32.4 \div 10^0 = \underline{32.4}$

$32.4 \div 10^1 = \underline{3.24}$

$32.4 \div 10^2 = \underline{0.324}$

### Problem Solving

10. The local café uses 510 cups of mixed vegetables to make 1,000 quarts of beef barley soup. Each quart of soup contains the same amount of vegetables. How many cups of vegetables are in each quart of soup?

0.510 cups

$$510 \div 1000 = 0.510$$

11. The same café uses 18.5 cups of flour to make 100 servings of pancakes. How many cups of flour are in one serving of pancakes?

0.185 cups

$$18.5 \div 100 = 0.185$$



## Compare and Order Decimals

Compare. Write  $<$ ,  $>$ , or  $=$ .

1.  $4.735 < 4.74$

2.  $2.549 = 2.549$   
*2.549*

3.  $3.207 > 3.027$   
*3.027*

4.  $8.25 = 8.250$   
*8.250*

5.  $5.871 > 5.781$   
*5.781*

6.  $9.36 > 9.359$

7.  $1.538 < 1.54$

8.  $7.036 > 7.035$

9.  $6.700 = 6.7$

Order from greatest to least.

10. ~~3.008~~; ~~3.825~~; ~~3.09~~; ~~3.18~~

*3.825; 3.18; 3.09; 3.008*

11. ~~0.275~~; ~~0.2~~; ~~0.572~~; ~~0.725~~

*0.725; 0.572; 0.275; 0.2*

12. ~~6.318~~; ~~6.32~~; ~~6.230~~; ~~6.108~~

*6.32; 6.318; 6.230; 6.108*

13. ~~0.456~~; ~~1.345~~; ~~0.645~~; ~~0.654~~

*1.345; 0.654; 0.645; 0.456*

Algebra Find the unknown digit to make each statement true.

14.  $2.48 > 2.4 \boxed{7} 1 > 2.463$

15.  $5.723 < 5.72 \boxed{4} < 5.725$

16.  $7.64 < 7. \boxed{6} 5 < 7.68$

### Problem Solving

17. The completion times for three runners in a 100-yard dash are 9.75 seconds, 9.7 seconds, and 9.675 seconds. Which is the winning time?

*9.675 sec*

*Winning time is the quickest or shortest amount of time*

18. In a discus competition, an athlete threw the discus 63.37 meters, 62.95 meters, and 63.7 meters. Order the distances from least to greatest.

*62.95, 63.37, 63.7*