

STUDY LINK
2·1

Large Numbers



trillions			billions			millions			thousands			ones		
100,000,000,000,000	10,000,000,000,000	1,000,000,000,000	100,000,000,000	10,000,000,000	1,000,000,000	100,000,000	10,000,000	1,000,000	100,000	10,000	1,000	100	10	1

1. Write the digit in each place of the number 6,812,507,439.

- a. millions _____ b. hundred thousands _____ c. ten millions _____
 d. billions _____ e. hundred millions _____ f. ten thousands _____

2. Write each of the following numbers in standard form.

- a. four hundred thirty thousand _____
 b. ninety million, one hundred five thousand _____
 c. one hundred seventy million, sixty-five _____
 d. nine billion, five hundred million,
 two hundred forty-three thousand _____

3. Write each number in expanded form. **Example:** $235 = (2 * 100) + (3 * 10) + (5 * 1)$

a. 321,000

b. 7,300,000,000,000

c. 2,510,709

4. Use extended facts to complete the following.

a. 1 million = 1,000 * _____

b. 1 billion = 1,000 * _____

c. 1 trillion = 1,000 * _____

Large Numbers *continued*

trillion

billion

million

thousand

Because the orbits of the planets are elliptical in shape, the distance between two planets changes over time. The least distances of Mercury, Venus, Saturn, and Neptune from Earth appear in the table at the right. The distances are approximations.

Least Distance from Earth	
Planet	Distance (in miles)
Mercury	48,000,000
Venus	25,700,000
Saturn	850,000,000
Neptune	2,680,000,000

5. Write each planet's least distance from Earth in number-and-word notation.

a. Mercury _____

b. Venus _____

c. Saturn _____

d. Neptune _____

6. Write the following numbers in standard notation.

a. 44.3 billion _____

b. 6.5 trillion _____

c. 0.9 million _____

d. 0.7 hundred _____

Practice

Round each number to the given place.

7. 416,254; hundreds

8. 234,989; ten thousands

9. 1,857,000; hundred thousands

10. 6,593,278; millions

LESSON
2·1

Walking Away with a Billion Dollars



Suppose you inherit one billion dollars. The bank pays you the entire amount of money in \$100 bills. About how much will your payment weigh in tons?

Use the information below to solve the problem.

- ◆ You can cover a sheet of paper with about six \$100 bills.
- ◆ There are 500 sheets in a ream of paper.
- ◆ There are 10 reams in 1 carton of paper.
- ◆ One ream of paper weighs about 5 pounds.
- ◆ One ton equals 2,000 pounds.

Show all your work. Write an explanation that is clear and easy to follow.

STUDY LINK
2·2

Writing Decimals



1. Build a numeral. Write:
 9 in the thousandths place,
 4 in the tenths place,
 8 in the ones place,
 3 in the tens place, and
 6 in the hundredths place.

Answer:

2. Build a numeral. Write:
 3 in the tenths place,
 6 in the ten-thousandths place,
 4 in the hundredths place,
 0 in the thousandths place, and
 1 in the ones place.

Answer:

Write the following numbers in words.

3. 0.8 _____
4. 0.95 _____
5. 0.05 _____
6. 0.067 _____
7. 4.0802 _____

Write a decimal place value in each blank space.

8. Bamboo grows at a rate of about 0.00004, or four _____, kilometer per hour.
9. The average speed that a certain brand of catsup pours from the mouth of the bottle is about 0.003, or three _____, mile per hour.
10. A three-toed sloth moves at a speed of about 0.068 to 0.098, or sixty-eight _____ to ninety-eight _____, mile per hour.

STUDY LINK
2·2

Writing Decimals *continued*



hundreds	tens	ones	and	tenths	hundredths	thousandths	ten-thousandths	hundred-thousandths	millionths
100	10	1	.	0.1	0.01	0.001	0.0001	0.00001	0.000001

Write each of the following numbers in expanded notation.

Example: $2.756 = (2 * 1) + (7 * 0.1) + (5 * 0.01) + (6 * 0.001)$

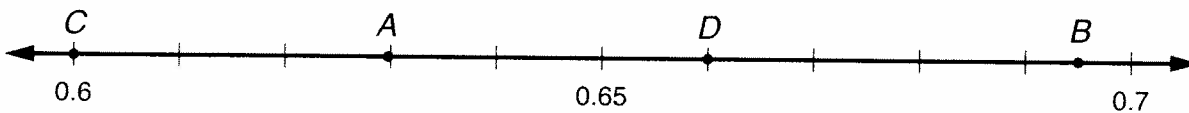
11. 0.013 _____

12. 109.3527 _____

13. Using the digits 0, 3, 6, and 8, write the greatest decimal number possible.

14. Using the digits 0, 3, 6, and 8, write the least decimal number possible.

Try This



Name the point on the number line that represents each of the following numbers.

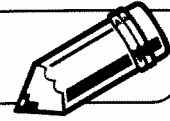
15. 0.66 _____ 16. 0.6299 _____ 17. 0.6 _____ 18. 0.695 _____

19. Refer to the number line above. Round 0.6299 to the nearest hundredth. _____

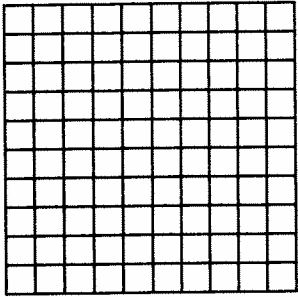
Practice

20. $0.01 + 0.006 + 0.0008 =$ _____ 21. $0.7 + 0.04 + 0.0002 =$ _____

22. _____ $= 40 + 5 + 0.009$ 23. _____ $= 0.50 + 0.080 + 0.00010$

LESSON
2·2
Modeling and Comparing Decimals


One way to compare decimals is to model them with base-10 grids.



The flat is the whole, or 1.0.



The long is worth 0.1.

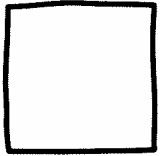


The cube is worth 0.01.



The fractional part of the cube is worth 0.001.

Another way to compare decimals is to draw pictures.



The flat is the whole, or 1.0.



The long is worth 0.1.



The cube is worth 0.01.



The fractional part of the cube is worth 0.001.

1. Use decimal models to complete the following.

$$1.0 = 0.10 * \underline{\hspace{2cm}} \qquad 0.10 = 0.01 * \underline{\hspace{2cm}} \qquad 0.01 = 0.001 * \underline{\hspace{2cm}}$$

Model the decimal numbers in each pair. Draw a picture to record each model. Then compare the decimal numbers using $<$, $>$, or $=$.

2.

$$0.3 \underline{\hspace{1cm}} 0.14$$

3.

$$1.56 \underline{\hspace{1cm}} 1.562$$

4.

$$0.2 \underline{\hspace{1cm}} 0.025$$

5. Model and record a decimal number that is between 0.41 and 0.42.

$$0.41 < \underline{\hspace{2cm}} < 0.42$$

STUDY LINK
2-3

Sports Records



Solve.

1. The fastest winning time for the New York Marathon (Tesfay Jifar of Ethiopia, 2001) is 2 hours, 7.72 minutes. The second fastest time is 2 hours, 8.017 minutes (Juma Ikangaa of Tanzania, 1989).

How much faster was Jifar's time than Ikangaa's? _____

2. In the 1908 Olympic Games, Erik Lemming of Sweden won the javelin throw with a distance of 54.825 meters. He won again in 1912 with a distance of 60.64 meters.

How much longer was his 1912 throw than his 1908 throw?

3. Driver Buddy Baker (Oldsmobile, 1980) holds the record for the fastest winning speed in the Daytona 500 at 177.602 miles per hour. Bill Elliott (Ford, 1987) has the second fastest speed at 176.263 miles per hour.

How much faster is Baker's speed than Elliott's?

4. The highest scoring World Cup Soccer Final was in 1954. Teams played 26 games and scored 140 goals for an average of 5.38 goals per game. In 1950, teams played 22 games and scored 88 goals for an average of 4 goals per game.

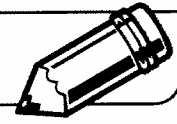
What is the difference between the 1954 and the 1950 average goals per game?

5. $46.09 + 123.047$ Estimate _____ 6. $0.172 + 4.5$ Estimate _____
 $46.09 + 123.047 =$ _____ $0.172 + 4.5 =$ _____

Practice

Solve mentally.

7. $\$0.36 + \$0.29 + \$0.64 +$ _____ $= \$2.00$
8. $7.03 +$ _____ $+ 14.05 + 13.07 = 35$
9. $9.225 + 8.5 + 5.775 +$ _____ $= 25$
10. $\$3.69 +$ _____ $+ \$8.31 + \$6.25 = \$25$

LESSON
2·4
“What’s My Rule?”


For each problem, complete the table and find the rule. Use Problem 4 to write your own “What’s My Rule?” problem.

1. Rule: _____

in	out
\$10	\$100
\$25	
	\$1,450
\$7,985	
	\$2,300,000

2. Rule: _____

in	out
\$0.10	
\$3.00	\$30.00
	\$500.00
\$88.50	
\$235.75	

3. Rule: _____

in	out
\$0.90	\$0.09
\$5.00	\$0.50
	\$2.00
\$760	
\$1,000	

4. Rule: _____

in	out

STUDY LINK
2•5

Multiplying Decimals: Part 1



Multiply.

1.
$$\begin{array}{r} 23 \\ * 87 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 56 \\ * 23 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 124 \\ * 96 \\ \hline \end{array}$$



4. Use your answer for Problem 1 to place the decimal point in each product.

a. $2.3 * 8.7 =$ _____

b. $23 * 0.87 =$ _____

c. $2.3 * 87 =$ _____

5. Use your answer for Problem 3 to place the decimal point in each product.

a. $124 * 9.6 =$ _____

b. $1.24 * 9.6 =$ _____

c. $12.4 * 0.96 =$ _____

Two new U.S. nickels were issued in 2004. A likeness of Thomas Jefferson remained on the front of the nickels. The reverse side featured images commemorating either the Louisiana Purchase or the Lewis and Clark expedition.

6. A U.S. nickel is 1.95 mm thick.

a. Estimate the height of a stack of 25 nickels. Estimate _____ mm

b. Calculate the actual height of the stack in mm. _____ mm

c. How much is a stack of 25 nickels worth? _____

Practice

Multiply by 0.10 to find 10% of each number.

7. 10% of \$50.00 = _____

8. 10% of \$110.00 = _____

9. 10% of 345 = _____

10. 10% of 0.70 = _____

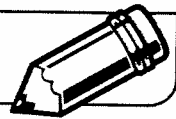
LESSON
2·5**Estimating and Calculating Cost**

Suppose you have \$25.00 to spend on snacks for your basketball team. You need to purchase 25 pieces of fruit and 25 beverages. The table below shows the food items available and the cost of each item.

Fruit	Cost	Beverages	Cost
Banana	\$0.42	Fruit punch	\$0.65
Apple	\$0.28	Orange juice	\$0.50
Orange	\$0.41	Bottled water	\$0.75

1. Make a table of the items you will buy, how many of each item, and the cost. Remember that you can spend up to \$25.00 but not more than \$25.00. Your table might have four columns with these headings: Food Item, Number of Items, Cost per Item, and Subtotals.

2. Explain how you decided which items to buy and how many of each item.

LESSON
2.5**Whole Number Multiplication**

Use your favorite multiplication algorithm to find the following products. Show your work in the computation grid below or on a separate sheet of paper.

1. $16 \times 17 =$ _____

2. $32 \times 45 =$ _____

3. _____ $= 4 \times 186$

4. _____ $= 89 \times 51$

5. _____ $= 724 \times 6$

6. $26 \times 32 =$ _____

7. $9 \times 5,668 =$ _____

8. _____ $= 37 \times 487$

STUDY LINK
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Multiplying Decimals: Part 2



Place a decimal point in each problem.

1. 2 4 3 * 7.06 = 171.558

2. 16.4 * 0.7 = 1 1 4 8

3. 8 2 7 * 9.5 = 7.8565

4. 7 5 6 3 * 5.1 = 3,857.13

Multiply. Show your work on a separate sheet of paper or on the back of this page.

5. _____ = 2.28 * 7.9

6. _____ = 49.7 * 0.6

7. _____ = 3.84 * 13

8. _____ = 0.19 * 53.9

Solve each problem. Then write a number model.
(Hint: Change fractions to decimals.)

9. Janine rides her bike at an average speed of 11.8 miles per hour. At that speed, about how many miles can she ride in $6\frac{1}{2}$ hours? _____

Number Model _____

10. Kate types at an average rate of 1.25 pages per quarter hour. If she types for $2\frac{3}{4}$ hours, about how many pages can she type? _____

Number Model _____

11. Find the area in square meters of a rectangle with length 1.4 m and width 2.9 m. _____

Number Model _____

Practice

Multiply mentally by 0.10 to find 10%. Then mentally calculate the percent that has been assigned to each number.

12. 20% of \$80.00 = _____

13. 5% of \$220.00 = _____

14. 15% of 640 = _____

15. 30% of 80 = _____