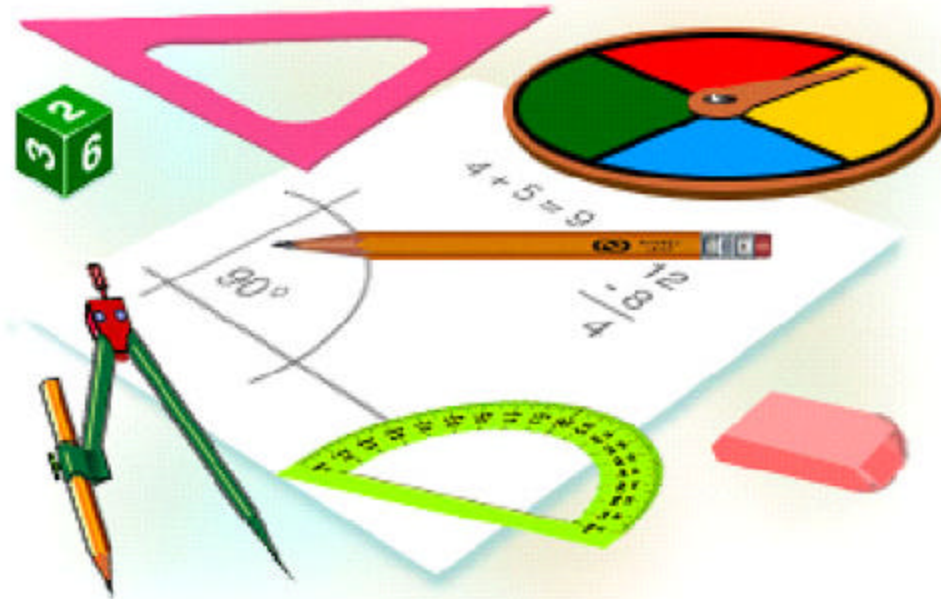# The Next Step

Mathematics Applications for Adults

<u>Book 14016 - Decimals</u>

OUTLINE
Mathematics - Book 14016

Decimals
Understanding and Comparing Decimals
organize a list of decimals and mixed decimals in ascending and descending order.
convert fractions to decimals.
convert decimals to fractions (excluding repeating decimals).
compare two decimals using "<" and ">" signs.
Addition of Decimals
add numbers containing decimals.
round off decimals to the hundredths place.
Subtraction of Decimals
subtract numbers containing decimals.
round off decimals to the hundredths place.
Multiplication of Decimals
multiply numbers containing decimals.
round off decimals to the hundredths place.
multiply decimals by 10, 100, 1,000 by moving decimal points required number of places.
Division of Decimals
divide numbers containing decimals.
round off decimals to the hundredths place.
divide decimals by 10, 100, 1,000 by moving decimal points required number of places.
Word Problems with Decimals
solve one/two step problems with addition, subtraction, multiplication, and division of decimals.

THE NEXT STEP

Book 14016

Decimals

Understanding and Comparing Decimals

The numerals we use today are called ***decimal*** numerals. These numerals stand for the numbers in the decimal system. The decimal system is also known as the Arabic system. The decimal system was first created by Hindu astronomers in India over a thousand years ago. It spread into Europe around 700 years ago.

The ***decimal system*** uses ten symbols: ***0, 1, 2, 3, 4, 5, 6, 7, 8,*** and ***9***. The word "decimal" comes from the Latin root ***decem***, meaning "ten."

Comparing Decimals

Comparing decimals uses an important mathematical concept. You can add zeros to the right of the last decimal digit without changing the value of the number. Study these examples.

RULE When comparing decimals with the same number of decimal places, compare them as though they were whole numbers.

Example   Which is greater, 0.364 or 0.329?
                        Both numbers have three decimal places.
                        Since 364   is greater than 329, the
                        decimal **0.364 > 0.329.**

The rule for comparing whole numbers in which the number with more digits is greater does not hold true for decimals. The decimal number with more decimal places is not necessarily the greater number.

RULE When decimals have a different number of digits, write zeros to the right of the decimal with fewer digits so the numbers have the same number of decimal places. Then compare.

Example   Which is greater, 0.518 or 0.52?
                        Add a zero to 0.52.
                        Since 520 > 518, the decimal **0.52 > 0.518.**

RULE When numbers have both whole number and decimal parts, compare the whole numbers first.

Example 1   Compare 32.001 and 31.999.
                        Since 32 is greater than 31, the number
                        32.001 is   greater than 31.999. It
                        does not matter that 0.999 is greater than
                        0.001.

Using the same rules, you can put several numbers in order according to value. When you have several numbers

to compare, write the numbers in a column and line up the decimal points. Then add zeros to the right until all the decimals have the same number of decimal digits.

Example 2   A digital scale displays weight to thousandths of a   pound.
Three packages weigh 0.094 pound, 0.91 pound, and 0.1 pound. Arrange the weights in order from greatest to least.

Step 1   Write the weights in a column, aligning the
0.094
decimal point.
0.91**0**

Step 2   Add zeros to fill out the columns.
0.1**00**

Step 3   Compare as you would whole numbers.

In order from greatest to least, the weights are **0.91, 0.1, and 0.094 pound.**

<u>**Equivalent Decimals**</u>
<u>Decimals</u> that name the same number or amount
Example:
$0.5 = 0.50 = 0.500$

Practice Exercise

Compare the given decimals.

1.	0.78	<	0.95
2.	0.483	_____	48.3
3.	0.68	_____	0.86
4.	9926.493	_____	9962.493
5.	0.48	_____	0.055
6.	0.6	_____	0.06
7.	0.165	_____	16.5
8.	0.27	_____	2.8
9.	0.968	_____	0.008
10.	1252.479	_____	1225.479
11.	1613.276	_____	1631.276
12.	0.984	_____	0.071
13.	0.34	_____	0.34
14.	9.84	_____	0.003
15.	0.905	_____	0.01

16.	0.490	_____	0.94
17.	0.032	_____	0.032
18.	0.97	_____	9.7
19.	0.34	_____	0.09

Decimals and Place Value

Decimal

A number that uses place value and a decimal point to show values less than one, such as tenths and hundredths
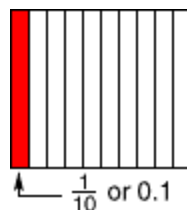
Example:

3.47

	hundreds	tens	ones	Decimal point	tenths	hundredths	thousandths
$10\frac{1}{10}$		1	0	.	1		
$205\frac{3}{100}$	2	0	5	.	0	3	
$4\frac{9}{1000}$			4	.	0	0	9

Tenth

One of ten equal parts

Example:

$\frac{1}{10}$ or 0.1

Hundredth
One of one hundred equal parts
Example:

$\frac{1}{100}$ or 0.01
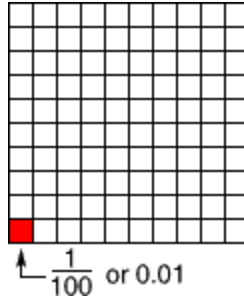
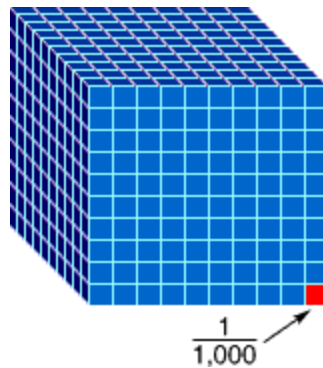# **Thousandth**
One part of 1,000 equal parts
Example:

$\frac{1}{1,000}$

How do you write 16.034 in words?

Read the whole number part of the number. Say *and* to represent the decimal point. Read the digits to the right of the decimal point, and say the place name of the last digit on the right. Note that there are no commas setting off groups of three digits in the decimal part of the number to the right of the decimal point.

The number 16.034 is read *sixteen and thirty-four thousandths.*

Þ **Be careful!!! Although most Canadians and Americans recognize the "." as a decimal point, the decimal point is expressed as a comma in many countries. Most French Canadians use the comma to represent the decimal point.**

Decimal Fractions and Decimal Numbers

Decimal fractions or *decimals* are fractions with denominators of *10*, *100*, *1,000*, *10,000*, and so on.

Decimal fractions are written using a decimal point:

$$\frac{1}{10} = .1 \qquad \frac{1}{100} = .01 \qquad \frac{1}{1000} = .001$$

Changing a Fraction to a Decimal

Any fraction can be written as a decimal by dividing the numerator by the denominator, and adding a decimal point in the correct place.

$$\frac{1}{10} = 10\overline{)1.0}^{.1} \qquad \frac{3}{5} = 5\overline{)3.0}^{.6} \qquad \frac{1}{4} = 4\overline{)1.00}^{.25}$$

Þ *In decimal notation, a decimal point distinguishes whole numbers from decimal fractions:*

$$1 = 1.0$$
$$\frac{1}{10} = 0.1$$
$$1\frac{1}{10} = 1.1$$

Practice Exercise

Write each fraction in decimal format.

1. $\dfrac{2}{10} =$ **0.2** 2. $\dfrac{42}{100} =$ _____

3. $\dfrac{14}{20} =$ _____ 4. $\dfrac{3}{4} =$ _____

5. $\dfrac{61}{50} =$ _____ 6. $\dfrac{2}{5} =$ _____

7. $\dfrac{1}{5} =$ _____ 8. $\dfrac{5}{20} =$ _____

9. $10\dfrac{316}{400} =$ _____ 10. $9\dfrac{66}{100} =$ _____

11. $22\dfrac{52}{80} =$ _____ 12. $7\dfrac{22}{50} =$ _____

13. $18\dfrac{4}{20} =$ _____ 14. $\dfrac{388}{80} =$ _____

Changing Decimals to Fractions

Both decimals and fractions can be used to show part of a whole. Sometimes it is easier to calculate using fractions. At other times, decimals are more useful. If you know how to change from one form to the other, you can solve any problem using the form that is best for the situation.

Example Change 0.375 to a fraction.

Step 1 Write the number without the decimal point as the numerator of the fraction.

$$0.375 = \frac{375}{?}$$

Step 2 Write the place value for the last decimal digit as the denominator.

$$0.375 = \frac{375}{1000}$$

Step 3 Reduce the fraction to lowest terms.

$$\frac{375 \div 125}{1000 \div 125} = \frac{3}{8}$$

The decimal 0.375 is equal to the fraction **3/8.**

Practice Exercise

Write each decimal as a fraction or mixed number in lowest terms.

1. 0.62 = _____ 2. 0.85 = _____

3. 0.41 = _____ 4. 0.44 = _____

5. 0.69 = _____ 6. 0.71 = _____

7. 0.16 = _____ 8. 0.75 = _____

9. 0.6 = _____ 10. 0.84 = _____

11. 64.5 = _____ 12. 40.5 = _____

13. 41.9 = _____ 14. 40.55 = _____

15. 73.4 = _____ 16. 76.4 = _____

Addition of Decimals

Adding decimals is easy.

First, align the decimal points of the decimals. Then treat decimal fractions like whole numbers, aligning the decimal point in the sum. Adding decimals may look familiar---it's just like adding money.

align decimal points

```
  1
  6.80
+8.25
15.05
```

align decimal in sum

Estimating can be a very useful skill. In many everyday situations involving money, for example, you do not need exact amounts. You can estimate when you want to know if you have enough cash to pick up the three things you want at the grocery store or about how much each person should contribute to split the cost of lunch. In such cases, you can use amounts rounded to the nearest dollar (the ones place).

Rounding means to express a number to the nearest given place. The number in the given place is increased by one if the digit to its right is 5 or greater. The number in the

given place remains the same if the digit to its right is less than 5. When rounding whole numbers, the digits to the right of the given place become zeros (digits to the left remain the same). When rounding decimal numbers, the digits to the right of the given place are dropped (digits to the left remain the same).

If you are rounding 3 to the nearest tens place, you would round down to 0, because 3 is closer to 0 than it is to 10.

0   1   2   3   4   5   6   7   8   9

If you were rounding 9, you would round up to 10.

1   2   3   4   5   6   7   8   9   10
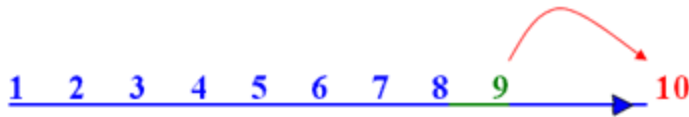
General Rule for Rounding to the Nearest 10, 100, 1,000, and Higher!

Round down from numbers under 5 and round up from numbers 5 and greater.

The same holds true for multiples of 10. Round to the nearest 100 by rounding down from 49 or less and up from 50 or greater. Round to the nearest 1,000 by rounding down from 499 or less and up from 500 or greater.

Example   Using the following price list, <u>about</u> how much would Pat pay for a steering wheel cover, a wide-angle mirror, and an oil drip pan?

<table>
<tr><td colspan="2" align="center">**Auto Parts Price List**</td></tr>
<tr><td>Outside Wide-Angle Mirror</td><td>$13.45</td></tr>
<tr><td>Steering Wheel Cover</td><td>$15.95</td></tr>
<tr><td>Oil Drip Pan</td><td>$ 8.73</td></tr>
<tr><td>Windshield Washer Fluid</td><td>$ 2.85</td></tr>
<tr><td>Brake Fluid</td><td>$ 6.35</td></tr>
</table>

Round the cost of each item to the nearest dollar and find the total of the estimates.

Item	Cost	Estimate
Steering wheel cover	$15.95	$16
Wide-angle mirror	13.45	13
Oil drip pan	+ 8.73	+ 9
Total:	$38.13	$38

The best estimate is **$38** which is close to the actual cost of **$38.13.**

The steps for rounding decimals are similar to those you use for rounding whole numbers. The most important difference is that once you have rounded off your number, you must *drop the remaining digits.*

Example Round 5.362 to the nearest tenth.

Step 1 Find the digit you want to round to.
It may help to circle, underline, or highlight it.

<div align="center">

5.362

</div>

Step 2 Look at the digit immediately to the right of the highlighted digit.

<div align="center">

5.362

</div>

Step 3 If the digit to the right is 5 or more, add 1 to the highlighted digit. If the digit to the right is less than 5, do not change the highlighted digit. *Drop the remaining digits.*

<div align="center">

5.4

</div>

Examples Round 1.832 to the nearest hundredth.

<div align="center">

1.832 rounds to 1.83

</div>

Round 16.95 to the nearest tenth.

<div align="center">

16.95 rounds to 17.0

</div>

Round 3.972 to the ones place.

3.972 rounds to 4

Practice Exercise

Solve each problem on the next page.

1.
```
    1.8
+  72.4
```

2.
```
   70.8
+   5.6
```

3.
```
   9.19
+   6.8
```

4.
```
   93.3
+   8.1
```

5.
```
   15.6
+  44.9
```

6.
```
   81.2
+  66.3
```

7.
```
   87.9
+   7.1
```

8.
```
    6.8
+   7.1
```

9.
```
   88.6
+  49.4
```

10.
```
    4.59
+  78.09
```

11.
```
   86.5
+   2.29
```

12.
```
   74.9
+  92.3
```

13.
```
   81.41
+  43.89
```

14.
```
    9.4
+   8.3
```

15.
```
    3.2
+  30.9
```

16.
```
   94.86
+  52.38
```

17.
```
    4.76
+  80.83
```

18.
```
   74.09
+  90.7
```

19.
```
    5.9
+   1.4
```

20.
```
    2.29
+   5.6
```

21.
```
   58.2
+  94.6
```

22.
```
    9.19
+   9.8
```

23.
```
   54.47
+  73.14
```

24.
```
    2.7
+   3.3
```

```
25.  32.94  26.     99.4  27.     44.5  28.       6.8
   + 96.33      + 53.5      +   21.4          + 9.8
```

Round to tenths:

(1)   5.21   (2)   25.26   (3)   945.95

(4)   1.43   (5)   43.04   (6)   777.18

Round to hundredths:

(7)   0.638   (8)   4.08   (9)   43.698

(10) 0.413   (11) 0.178   (12) 92.415

Round to the nearest dollar:

(13) $19.02   (14) $24.49   (15) $19.30

(16) $5.60   (17) $22.74   (18) $8.73

Subtraction of Decimals

Subtracting decimals is easy.

First, align the decimal points of the decimals. Then treat
decimal fractions like whole numbers, aligning the decimal

point in the remainder. Subtracting decimals may look familiar---it's just like subtracting money.

To subtract decimals, if necessary, use place-holding zeros. Note: Whole numbers are understood to have a decimal point to the right of the ones place.

$$12 - 4.08 = \quad \begin{array}{r} 12.00 \\ -4.08 \\ \hline 7.92 \end{array}$$

Estimating can be a very useful skill. In many everyday situations involving money, for example, you do not need exact amounts. In such cases, you can use amounts rounded to the nearest dollar (the ones place).

Example   Susan has $213 in a checking account. If she writes a check for $32.60, <u>about</u> how much will be left in the account?

Round the amount of the check off to the nearest dollar and find the difference.

$$\begin{array}{r} \$213.00 \\ - \ \$ \ 32.60 \\ \hline \$180.40 \end{array} \qquad \begin{array}{r} \$213 \\ - \ \$ \ 33 \\ \hline \$180 \end{array}$$

The best estimate is **$180** which is close to the actual amount of **$180.40.**

Practice Exercise

Solve each problem.

1. 83.2
   − 3.4

2.   9.1
   −8.19

3. 32.5
   −17.6

4. 53.7
   −22.2

5.   6.9
   − 1.2

6. 48.4
   − 1.7

7.   9.5
   − 1.9

8. 97.5
   −54.2

9. 59.7
   − 2.1

10. 72.8
   −61.3

11. 4.59
   − 3.8

12. 71.59
   − 7.3

13. 28.2
   − 4.5

14. 81.14
   −47.79

15.   8.5
   − 1.4

16. 76.9
   −18.3

17. 80.24
   −42.66

18.   7.2
   − 5.4

19. 77.7
   −15.2

20. 68.97
   −7.31

21. 71.9
   − 5.4

22. 9.19
   − 8.1

23. 90.2
   −56.5

24.   4.4
   −2.29

25.   4.4
   − 1.9

26. 56.91
   −46.54

27.   1.9
   − 1.1

28. 59.9
   − 2.1

Multiplication of Decimals

To multiply decimals, treat them as if they were whole numbers, at first ignoring the decimal point.

$$\begin{array}{r} 4.1 \\ \underline{\times\ .3} \\ 123 \end{array}$$

Next, count the number of places to the right of the decimal point in the multiplicand. Add this to the number of places to the right of the decimal point in the multiplier.

4.1 multiplicand ------------ **one place**
x .3 multiplier -------------- **+one place**
two places

Last, insert the decimal point in the product by counting over from the right the appropriate number of places.

$$\begin{array}{r} 4.1 \\ \underline{\times\ .3} \\ 1.23 \end{array}$$ —count over two places from right

Insert decimal point

Here are two other examples:

$$
\begin{array}{r}
8.9 \\
\times\ 1.0 \\
\hline
0\ 0 \\
8\ 9\ 0 \\
\hline
8.\ 9\ 0
\end{array}
\qquad
\begin{array}{r}
65.003 \\
\times\ .025 \\
\hline
325015 \\
1300060 \\
\hline
1.625075
\end{array}
$$

Estimating can be a very useful skill. In many everyday situations involving money, for example, you do not need exact amounts. In such cases, round each factor to its greatest place. Then multiply.

Example   Richard earns $7.90 per hour and works 38.5 hours each week. How much are his total earnings per week?

Round each factor to its greatest place and multiply.

$$
\begin{array}{r}
38.5 \\
\$7.90 \\
\hline
3950
\end{array}
\qquad
\begin{array}{l}
40\ \text{hours} \\
\underline{\$8\ \text{per hour}} \\
\$320\ \text{weekly wages, estimate}
\end{array}
$$

$$
\begin{array}{r}
6320 \\
\underline{2370} \\
\$304.150
\end{array}
$$

The best estimate is **$320** which is close to the actual solution of **$304.15.**

Multiplying Decimals by 10, 100, and 1,000

There are shortcuts you can use when multiplying decimals by 10, 100, and 1,000.

To multiply a decimal by 10, move the decimal point **one place to the right.**

Example .26 x 10

$$.26 \times 10 = 2.6 = 2.6$$

To multiply a decimal by 100, move the decimal point **two places to the right.**

Example 3.7 x 100

$$3.7 \times 100 = 3.70 = 370$$

To multiply a decimal by 1,000, move the decimal point **three places to the right.**

Example 1.4 x 1,000

$$1.4 \times 1,000 = 1.400 = 1,400$$

Practice Exercise

Multiply each number by 10, 100, and 1,000.
Hint: You only need to move the decimal points and add 0 if needed.

		× 10	× 100	× 1,000
1.	910.86	9,108.6	91,086	910,860
2.	5.987537	_____	_____	_____
3.	31.83	_____	_____	_____
4.	76.5487	_____	_____	_____
5.	6,690.71	_____	_____	_____
6.	2.606	_____	_____	_____
7.	3.956666	_____	_____	_____
8.	577.35	_____	_____	_____
9.	46.541	_____	_____	_____
10.	626.317	_____	_____	_____
11.	2.163592	_____	_____	_____
12.	94.51	_____	_____	_____
13.	4,817.27	_____	_____	_____
14.	87.16543	_____	_____	_____
15.	751.72	_____	_____	_____
16.	26.95	_____	_____	_____

17. 6,523.16 _____ _____ _____

18. 12 _____ _____ _____

19. 261 _____ _____ _____

20. 39 _____ _____ _____

Solve each problem.

1.   2.8   2.   0.4   3.   0.4   4.   7.3
      × 0.9   × 3   × 5   × 0.5

5.   7.7   6.   0.1   7.   4.8   8.   7.7
     × 0.88   × 0.89   × 0.43   × 0.92

9.   8.1   10.   7.1   11.   1.4   12.   5.8
     × 0.62   × 0.82   × 0.8   × 0.9

13.   42.7   14.   25.18   15.   40.551   16.   8.97
   × 30.08   × 44.927   × 35.054   × 32

17.   15.62   18.   5.5   19.   32.82   20.   38.18
   × 4.006   × 16.637   × 46.06   × 16.95

Division of Decimals

Begin dividing decimals the same way you would divide whole numbers.

If the number in a division box (the dividend) has a decimal, but the number outside of the division box (the divisor) does not have a decimal, place the decimal point in the quotient (the answer) directly above the decimal point in the division box.

$$5\overline{)0.010} \quad \text{with quotient } 0.002$$

If both the numbers inside and outside of the division box have decimals, count how many places are needed to move the decimal point outside of the division box (the divisor) to make it a whole number. Move the decimal point in the number inside of the division box (the dividend) the same number of places.

Place the decimal point in the quotient (the answer) directly above the new decimal point.

$$0.05\overline{)0.01} = 5\overline{)1} = 5\overline{)1.0}^{\,0.2}$$

If the number outside of the division box has a decimal, but the number inside of the division box does not, move the decimal place on the outside number however many places needed to make it a whole number. Then to the right of the number in the division box (a whole number with an "understood decimal" at the end) add as many zeros to match the number of places the decimal was moved on the outside number. Place the decimal point in the quotient directly above the new decimal place in the division box.

$$0.05\overline{)1} = 0.05\overline{)1.00} = 5\overline{)100}^{\,20}$$

dividends

$$1.5 \diagup 6 \qquad .036 \diagup 7.2$$
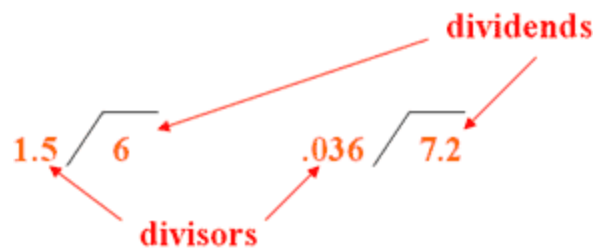
divisors

(Note that $6 = 6.0$.)

Estimating can be a very useful skill. In many everyday situations involving money, for example, you do not need exact amounts. In such cases, round the divisor to its greatest place, and round the dividend so that it can be divided exactly by the rounded divisor. Then divide.

Example   If a plane flew 2,419.2 miles in 6.3 hours, what was its average speed in miles per hour?

Round the divisor to its greatest place, round the dividend so that it can be divided exactly by the rounded divisor, and divide.

$$6.3 \qquad 6 \text{ hours}$$
$$2,419.2 \qquad 2,400 \text{ miles}$$
$$2,400 \div 6 = 400 \text{ miles per hour, estimate}$$
$$2,419.2 \div 6.3 = 384 \text{ miles per hour}$$

The best estimate is **400 miles per hour** which is close to the actual answer of **384 miles per hour.**

Dividing Decimals by 10, 100, and 1,000

There are shortcuts you can use when dividing decimals by 10, 100, and 1,000.

To divide a decimal by 10, move the decimal point **one place to the left.**

Example $7.2 \div 10$

$$7.2 \div 10 = .72 = .72$$

To divide a decimal by 100, move the decimal point **two places to the left.**

Example $364 \div 100$

$$364 \div 100 = 3.64 = 3.64$$

To divide a decimal by 1,000, move the decimal point **three places to the left.**

Example $25.3 \div 1,000$

$$25.3 \div 1,000 = .0253 = .0253$$

Practice Exercise

Divide each number by 10, 100, and 1,000.
Hint: You only need to move the decimal points and add 0 if needed.

	÷ 10	÷ 100	÷ 1,000
1. 84,644.8	**8,464.48**	**846.448**	**84.6448**
2. 51.97922	_____	_____	_____
3. 383.8	_____	_____	_____
4. 84.363	_____	_____	_____
5. 7,256.88	_____	_____	_____
6. 103,081.2	_____	_____	_____
7. 79.938	_____	_____	_____
8. 3.802	_____	_____	_____
9. 7,140.067	_____	_____	_____
10. 368.08	_____	_____	_____
11. 3,641.47	_____	_____	_____
12. 1.073	_____	_____	_____
13. 1.776	_____	_____	_____
14. 752.39	_____	_____	_____
15. 94,351.9	_____	_____	_____
16. 78.15737	_____	_____	_____
17. 79,119.9	_____	_____	_____

18. 66   _____ _____ _____

19. 343   _____ _____ _____

20. 40   _____ _____ _____

Solve each problem.

1.	705	169.905	2.	71	637.864	3.	91	69.6696
4.	0.3	2745	5.	6.5	456885	6.	9.9	298287
7.	0.67	369371	8.	3.53	228038	9.	0.45	112365
10.	2.5	11.745	11.	7.39	24.67521	12.	1.6	51.68
13.	4.96	4.37968	14.	5	7.2	15.	0.1	0.293
16.	5.9	281.784	17.	7.9	367.35	18.	0.76	29.4576
19.	4.2	37.212	20.	1.2	0.040944	21.	6.3	247.59
22.	3.63	129.0828	23.	5.2	16.4528	24.	0.72	3.39408

Word Problems with Decimals

1. In 1991, 56.8 thousand people lived in Moncton, New Brunswick. By 1996, there were 2.5 thousand more people. How many people lived in Moncton in 1996?

2. Janet bought 2.6 pounds of beef, 1.3 pounds of cheese, 2.45 pounds of chicken, and 5 pounds of sugar. What was the total weight she had to carry?

3. In polishing a piece of pipe that was 2 inches thick, .016 inch of metal was worn away. What was the thickness of the pipe when it was polished?

4. In 1974, the government counted 23.37 million people as being poor. In 1975, the government said there were 25.88 million people who were poor. How many more people did the government count as being poor in 1975 than in 1974?

5. One inch is equal to 2.54 centimeters. How many centimeters are there in 6.5 inches?

6. At $1.80 a meter, how much does 3.75 meters of wood cost?

7. A train traveled 144.9 miles in 4.2 hours. What was its average speed in miles per hour?

8. Mary made $24.70 for 6.5 hours of work. How much did she make each hour?

Answer Key

Book 14016 - Decimals

Page 6   **2.** <   **3.** <   **4.** <   **5.** >   **6.** >   **7.** <
             8. <   **9.** >   **10.** >   **11.** <   **12.** >
             13. =   **14.** >   **15.** >   **16.** <   **17.** =
             18. <   **19.** >

Page 10   **2.** .42   **3.** .7   **4.** .75   **5.** 1.22   **6.** .4
             7. .2   **8.** .25   **9.** 10.79   **10.** 9.66
             11. 22.65   **12.** 7.44   **13.** 18.2   **14.** 4.85

Page 12   **1.** 31/50   **2.** 17/20   **3.** 41/100   **4.** 11/25
             5. 69/100   **6.** 71/100   **7.** 4/25   **8.** ¾
             9. 3/5   **10.** 21/25   **11.** 64 ½   **12.** 40 ½
             13. 41 9/10   **14.** 40 11/20   **15.** 73 2/5
             16. 76 2/5

Page 17   **1.** 74.2   **2.** 76.4   **3.** 15.99   **4.** 101.4
             5. 60.5   **6.** 147.5   **7.** 95   **8.** 13.9
             9. 138   **10.** 82.68   **11.** 88.79   **12.** 167.2
             13. 125.3   **14.** 17.7   **15.** 34.1   **16.** 147.24
             17. 85.59   **18.** 164.79   **19.** 7.3   **20.** 7.89
             21. 152.8   **22.** 18.99   **23.** 127.61   **24.** 6
             25. 129.27   **26.** 152.9   **27.** 65.9   **28.** 16.6

Page 18   **1.** 5.2   **2.** 25.3   **3.** 946.0   **4.** 1.4
             5. 43.0   **6.** 777.2   **7.** .64   **8.** 4.08
             9. 43.70   **10.** .41   **11.** .18   **12.** 92.42

13. $19   **14.** $24   **15.** $19   **16.** $6

17. $23   **18.** $9

1. 79.8   **2.** .91   **3.** 14.9   **4.** 31.5

5. 5.7   **6.** 46.7   **7.** 7.6   **8.** 43.3   **9.** 57.6

10. 11.5   **11.** .79   **12.** 64.29   **13.** 23.7

14. 33.35   **15.** 7.1   **16.** 58.6   **17.** 37.58

18. 1.8   **19.** 62.5   **20.** 61.66   **21.** 66.5

22. 1.09   **23.** 33.7   **24.** 2.11   **25.** 2.5

26. 10.37   **27.** .8   **28.** 57.8

2.	59.87537	598.7537	5987.537
3.	318.3	3183	31830
4.	765.487	7654.87	76548.7
5.	66907.1	669071	6690710
6.	26.06	260.6	2606
7.	39.56666	395.6666	3956.666
8.	5773.5	57735	5477350
9.	465.41	4654.1	46541
10.	6263.17	62631.7	626317
11.	21.63592	216.3592	2163.592
12.	945.1	9451	94510
13.	48172.7	481727	4817270
14.	871.6543	8716.543	87165.43
15.	7517.2	75172	751720
16.	269.5	2695	26950
17.	65231.6	652316	6523160
18.	120	1200	12000

19.	2610	26100	261000
20.	203.9	2039	20390

Page 25   **1.** 2.52   **2.** 1.2   **3.** 2   **4.** 3.65   **5.** 6.776
6. .089   **7.** 2.064   **8.** 7.084   **9.** 5.022
10. 5.822   **11.** 1.12   **12.** 5.22
13. 1284.416   **14.** 1131.26186
15. 1421.474754   **16.** 287.04   **17.** 62.57372
18. 91.5035   **19.** 1511.6892   **20.** 647.151

Page 30

2.	5.197922	.5197922	.05197922
3.	38.38	3.838	.3838
4.	8.4363	.84363	.084363
5.	725.688	72.5688	7.25688
6.	10308.12	1030.812	103.0812
7.	7.9938	.79938	.079938
8.	.3802	.03802	.003802
9.	714.0067	71.40067	7.140067
10.	36.808	3.6808	.36808
11.	364.147	36.4147	3.64147
12.	.1073	.01073	.001073
13.	.1776	.01776	.001776
14.	75.239	7.5239	.75239
15.	9435.19	943.519	94.3519
16.	7.815737	.7815737	.07815737
17.	7911.99	791.199	79.1199
18.	6.6	.66	.066
19.	34.3	3.43	.343

20.	4.0	.40	.040

1. .241   **2.** 8.984   **3.** .7656   **4.** 9150
5. 70290   **6.** 30130   **7.** 551300
8. 64600   **9.** 249700   **10.** 4.698
11. 3.339   **12.** 32.3   **13.** .883   **14.** 1.44
15. 2.93   **16.** 47.76   **17.** 46.5   **18.** 38.76
19. 8.86   **20.** .03412   **21.** 39.3   **22.** 35.56
23. 3.164   **24.** 4.714

1. 59.3 thousand people   **2.** 11.35 pounds
3. 1.984 inches   **4.** 2.51 million people
5. 16.51 centimeters   **6.** $6.75
7. 34.5 miles per hour   **8.** $3.80