# WELCOME TO INTERVENTION MATHEMATICS!

## Course Overview

This course is designed to review the student in basic concepts necessary for success in applying mathematics involved in everyday life. The subject matter studied is familiar and motivational, integrating problem solving and focusing on real applications of mathematical skills. This course is designed primarily for the student who seeks to improve his or her knowledge of basic mathematics. Topics studied include computations and applications of whole numbers, decimals, fractions, ratios, and percent; measurement in metric and customary units; geometric figures, finding volume and surface area; statistics, graphs, and probability; and integers, the coordinate plane, and algebraic equations.

We will explore lots of exciting topics in math and examine applications of the concepts in real world settings.  Let's begin with the basics, and then see how we apply them to actual math problems that are encountered in every day math.

Required Materials for Math Integrated Math I
Please print or save this document for future reference.

There are practice worksheets in many of the units that provide more practice on specific topics. The review worksheets are provided to give extra practice in skill areas presented in the unit. The worksheets are optional unless otherwise specified by the instructor. The worksheets are Adobe Acrobat files. Click on the pencil icon to open the document. Save the document to a folder on the computer, and then enter answers for the problems in the textboxes. Once the document is completed, make sure to SAVE it again, and then send the document to the instructor via email. The answer key provided is for the instructors only and is password protected.

# THE MEANING OF WHOLE NUMBERS AND DECIMALS

## Unit Overview

This unit is a review of the meaning of whole numbers and decimals. You will express the place value of whole numbers and decimals using various forms. You will compare, order, and round whole numbers and decimals. You will also determine how to find square roots of perfect squares and non-perfect squares.

Place Value

Positive Exponents

Perfect Squares and Square Roots
Approximating Square Roots of Non-Perfect Squares

Equivalent Decimals

Compare Whole Numbers and Decimals

Rounding Whole Numbers

Round Decimals

FIT (Federal Income Tax)

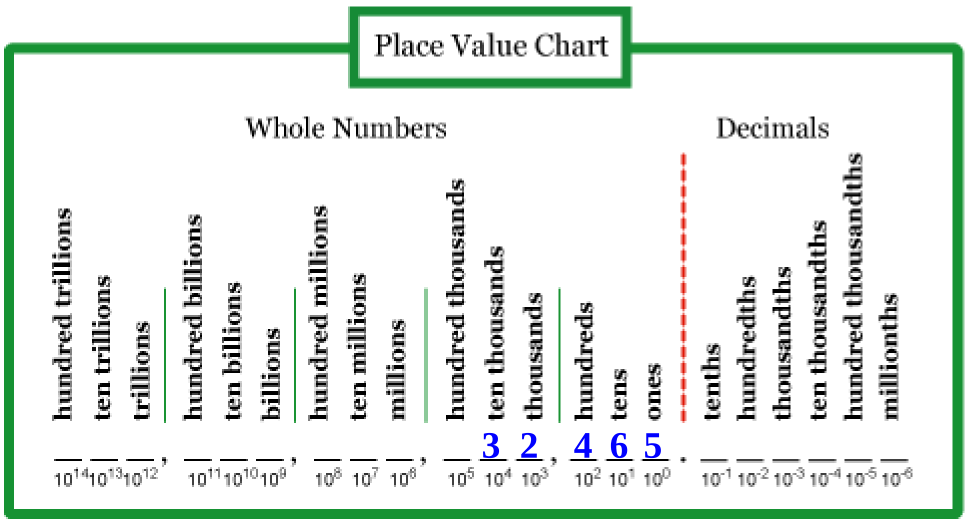
The United States Time Zones

## Place Value

To show the value of each digit in a numeral, write its expanded notation.

*Example 1*:  Use the Place Value Chart to write the expanded notation of 32,465.

Begin by placing the 5 in one's place, and then write each of the other digits to the left of the five.




The value of each digit is equal to the digit times the place that it holds.

3 ten thousands + 2 thousands + 4 hundreds + 6 tens + 5 ones

$3 \times 10{,}000 + 2 \times 1000 + 4 \times 100 + 6 \times 10 + 5 \times 1$

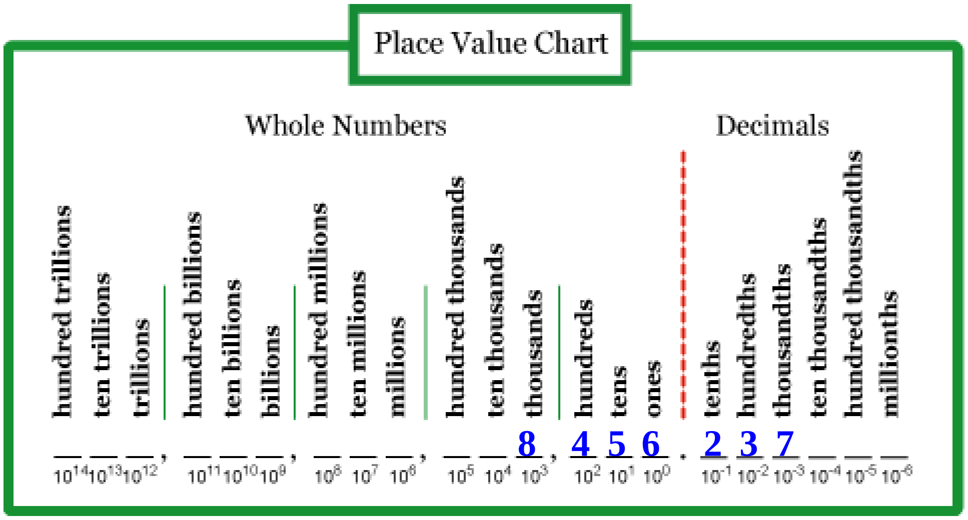
*Example 2*:  Use the Place Value Chart to write the expanded notation of 32,465 in exponent form.

3 ten thousands + 2 thousands + 4 hundreds + 6 tens + 5 ones

$3 \times 10^4 + 2 \times 10^3 + 4 \times 10^2 + 6 \times 10^1 + 5 \times 10^0$

*Example 3*: Use the Place Value Chart to write the expanded notation of 8,456.237.

Begin by placing the 6 in one's place. Write the digits 845 to the left of the six and write the digits 237 to the right of the decimal point.




The value of each digit is equal to the digit times the place that it holds.

8 thousands + 4 hundreds + 5 tens + 6 ones + 2 tenths + 3 hundredths + 7 thousandths

$8 \times 1{,}000 + 4 \times 100 + 5 \times 10 + 6 \times 1 + 2 \times \frac{1}{10} + 3 \times \frac{1}{100} + 7 \times \frac{1}{1000}$

*Example 4*: Use the Place Value Chart to write the expanded notation of 8,456.237 in exponent form.

8 thousands + 4 hundreds + 5 tens + 6 ones + 2 tenths + 3 hundredths + 7 thousandths

$8 \times 10^3 + 4 \times 10^2 + 5 \times 10^1 + 6 \times 10^0 + 2 \times 10^{-1} + 3 \times 10^{-2} + 7 \times 10^{-3}$

## Positive Exponents

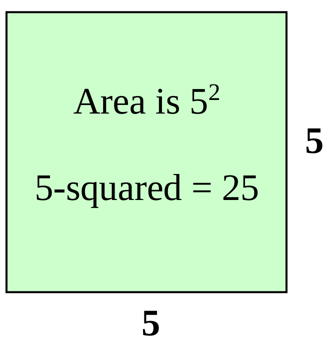
When a number is in exponential form, there are two parts: the base and the exponent.

base → $\mathbf{5^2}$ ← exponent

This number is read "**five to the second power"** or "**5-squared"**.

$$5^2 = 5 \times 5 = 25$$

Numbers that have an exponent of 2 can be represented by an area model of a square. Think of the area as a square with a side that is 5 units long.




Side = 5 units in length

$A = l \times w$
$A = 5 \times 5$
$A = 5^2$ or 25

$5 \times 5 = 25$ or $5^2$ or "5-squared"

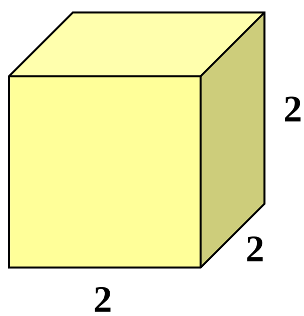
Now let's examine numbers that have an exponent of three.

$$\mathbf{2^3}$$

This number is read "**two to the third power**" or "**2-cubed**".

$$2^3 = 2 \times 2 \times 2 = 8$$

Numbers that have an exponent of 3 can be represented by a volume model of a cube. Think of a cube with a side that is 2 units long.




Side = 2 units in length

$V = l \times w \times h$
$V = 2 \times 2 \times 2$
$V = 2^3$ or 8

$2 \times 2 \times 2 = 8$ or $2^3$ or "2-cubed"

*Example 1*: How is $7^2$ read and what is its value?

$7^2$ is read 7-squared and has a value of $7 \times 7 =$ **49**.

*Example 2*: How is $3^6$ read and what is its value?

$3^6$ is read 3 to the 6th power.

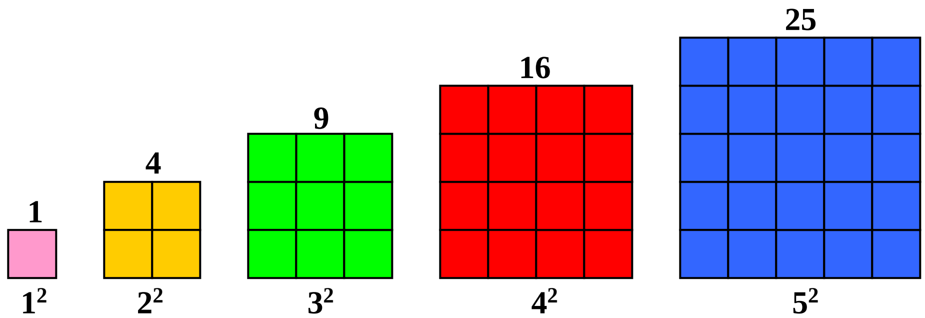
$3^6 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 =$ **729**.

# Perfect Squares and Square Roots

## Perfect Squares

**Perfect squares** are numbers that are squares of integers.

Some examples of perfect squares are shown in the figure below.  The first five squares of the counting numbers are shown.




| Square Notation | Perfect Square |
|---|---|
| **$1^2$ (1-squared)** | **1** |
| **$2^2$ (2-squared)** | **4** |
| **$3^2$ (3-squared)** | **9** |
| **$4^2$ (4-squared)** | **16** |
| **$5^2$ (5-squared)** | **25** |

*Example 1*: Find the first 12 perfect squares of the counting numbers.

$1^2 = 1 \times 1 = 1$ $\quad$ $7^2 = 7 \times 7 = 49$

$2^2 = 2 \times 2 = 4$ $\quad$ $8^2 = 8 \times 8 = 64$

$3^2 = 3 \times 3 = 9$ $\quad$ $9^2 = 9 \times 9 = 81$

$4^2 = 4 \times 4 = 16$ $\quad$ $10^2 = 10 \times 10 = 100$

$5^2 = 5 \times 5 = 25$ $\quad$ $11^2 = 11 \times 11 = 121$

$6^2 = 6 \times 6 = 36$ $\quad$ $12^2 = 12 \times 12 = 144$

The first 12 perfect squares are:

$\{1, 4, 9, 25, 36, 49, 64, 81, 100, 121, 144...\}$

Perfect squares are used often in math. Try to memorize these familiar numbers so that you can recognize them as they are used in many math problems.

The first five squares of the negative integers are shown below. Remember that a negative integer times a negative integer equals a positive integer.

| **Square Notation** | **Perfect Square** |
|---|---|
| $(-1)^2 = (-1 \times -1)$ | **1** |
| $(-2)^2 = (-2 \times -2)$ | **4** |
| $(-3)^2 = (-3 \times -3)$ | **9** |
| $(-4)^2 = (-4 \times -4)$ | **16** |
| $(-5)^2 = (-5 \times -5)$ | **25** |

## Square Roots

The **square root** operation is the reverse operation of squaring a number. In other words, to find the square root of a number, determine what number times itself equals the given number.

Finding a square root of a perfect square can be as easy as guessing the solution to the following algebraic equation:

$$x^2 = 49$$

If we understand the meaning of the exponent “2”, we know that a solution for *x* is 7 because we are finding a number that when multiplied times itself equals 49.

$$7(7) = 49$$

We must also remember that if we include negative values, there is another solution, –7.

$$-7(-7) = 49$$

This guess and check system for finding values of this type is fine and will work for perfect square numbers like 49, 64 , 81, 144, or even the value 1.

Actually, the set of values $\{1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144...\}$ all have relatively easy “guessable” square root solutions. This set of values is called the “perfect squares” because the numbers that are used as double factors are **integral** values…**perfect**.

The square root of 25 is 5 or –5.

The symbol for the square root operation is $\sqrt{\ }$ **.**

To indicate which root is desired, we will use the following notation:

$\sqrt{25} = 5 \qquad -\sqrt{25} = -5$

*Examples*:

a. $\sqrt{81} = 9$

b. $-\sqrt{81} = -9$

c. $\sqrt{0.49} = 0.7$

d. $\sqrt{\frac{25}{64}} = \frac{\sqrt{25}}{\sqrt{64}} = \frac{5}{8}$

**Try these!**

**On paper list the answers to the following problems. Look below for the correct answers.**

*Perfect Squares*

1. List the perfect squares of the counting numbers 13 through 20.

2. What is the square of 30?

3. What is the square of 0.09?

*Square Roots*

4. What is $-\sqrt{144}$ **?**

5. What is $\sqrt{1.21}$ ?

6. What is $\sqrt{\frac{9}{100}}$?

*Solutions*

1. 169, 196, 225, 256, 289, 324, 361, 400

2. 900

3. 0.0081

4. –12

5. 1.1

6. $\frac{3}{10}$

## √ Approximating Square Roots of Non-Perfect Squares

Consider solving this equation: $x^2 = 55$

Keep in mind there is no integer that will give us a solution. However, the value for *x* will be between 7 and 8 because $7^2 = 49$ and $8^2 = 64$.

We will guess and check until we get an approximate answer…

Try 7.5 $\rightarrow$ $7.5^2 = 56.25$ Close, but greater than 55.

We can get closer…

Try 7.4 $\rightarrow$ $7.4^2 = 54.76$ Close, but less than 55.

We will try to get just a little closer…

Try 7.45 $\rightarrow$ $7.45^2 = 55.5025$ Closer, but greater than 55.

Try a little lower…

Try 7.43 $\rightarrow$ $7.43^2 = 55.2049$ Getting closer, but still greater than 55.

Try a little lower…

Try 7.41 $\rightarrow$ $7.41^2 = 54.9081$ Getting closer, but lower than 55.

Try a little higher…

Try 7.42 $\rightarrow$ $7.42^2 = 55.0564$ **Close enough!**

Solution: $\sqrt{55} \approx 7.42$

The square root of 55 is approximately equal to 7.42.

*We use the "approximately equal" symbol $(\approx)$ since the square root of 55 is not exactly equal to 7.42.

In the previous estimation, we first guessed values of numbers in tenths that were close to the answer, and then we guessed values in hundredths. We kept guessing closer until we were able to be accurate with the best hundredth value. Determining which place value for estimation will depend on the problem at hand.

*Example*: Evaluate $\sqrt{115}$ to the nearest tenth.

Guess between 10 and 11, and since $10^2 = 100$ and $11^2 = 121$.

Guess closer to 11 since 115 is closer to 121.

Try 10.8 $\rightarrow$ $10.8^2 = 116.64$ Close, but greater than 115.

Try 10.6 $\rightarrow$ $10.6^2 = 112.36$ Close, but less than 115.

Try 10.7 $\rightarrow$ $10.7^2 = 114.49$ Closest answer to nearest tenth.

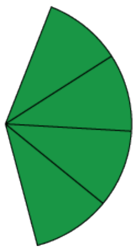
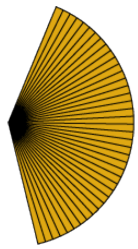
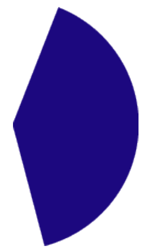
Solution: $\sqrt{115} \approx 10.7$

To the nearest tenth, the square root of 115 is approximately equal to 10.7.

## Equivalent Decimals

To make **equivalent decimals**, you may **add on zeros** as needed. *The zeros do not change the value of the decimal, just its appearance.*

$$2.4 \quad = \quad 2.40 \quad = \quad 2.400$$

2 +  = 2 +  = 2 + 

**2 and 4 tenths** = $2\frac{4}{10}$

**2 and 40 hundredths** = $2\frac{40}{100}$

**2 and 400 thousandths** $2\frac{400}{1000}$

To make **equivalent decimals**, you may **take off zeros** as needed.
*The zeros do not change the value of the decimal, just its appearance.*

$$2.400 = 2.40\not{0} = 2.4\not{0}\not{0}$$

$$2\frac{400}{1000} = 2\frac{40\not{0}}{100\not{0}} = 2\frac{4\not{0}\not{0}}{10\not{0}\not{0}}$$

$$2\frac{400}{1000} = 2\frac{40}{100} = 2\frac{4}{10}$$

$$2.400 = 2.40 = 2.4$$

*Example 1*: Name two equivalent decimals for 56.900.

$$56.9000 = 56.900\cancel{0} = 56.900$$

$$56.9000 = 56.9\cancel{0}\,\cancel{0}\,\cancel{0} = 56.9$$

Another equivalent decimal would be 56.90.

*Example 2*: Name two equivalent decimal fractions for 56.900.

$$56.9000 = 56\frac{9000}{10,000}$$

$$56.9000 = 56\frac{9\cancel{000}}{10,\cancel{000}} = 56\frac{9}{10}$$

Another equivalent decimal fraction is:

$$56.9000 = 56\frac{90\cancel{00}}{10,0\cancel{00}} = 56\frac{90}{100}$$

# Compare Whole Numbers and Decimals

## Compare Whole Numbers

Compare the numbers by looking at the first digits with the highest place-value.

Compare the following pairs of numbers.

*Example 1*:
2, 578 and 9,578

Compare the 2 and the 9. They are both in the thousand's place, but 9 is 7 digits higher than 2.

9,578 is greater than 2, 578 …**9,578 > 2, 578**

*Example 2*:
7, 245 and 7, 145

Compare the 7 and the 7 in the thousand's place of each number. They are equal so move down to hundred's place to compare the digits. Compare the 2 and the 1. The 2 is greater 1.

7, 245 is greater than 7,145…**7,245 > 7, 145**

*Example 3*:
311 and 321

Compare the digits in the hundred's place. The digits are both 3; so, move down to ten's place. Compare the 1 and the 2. The 1 is less than 2.

311 is less than 321…**311 < 321**

*Example 4*:
7,442 and 748

The first digit of the first number is in thousand's place; but, the first digit of the second number is in hundred's place. We know that a number that has a beginning digit in thousand's is greater than a number that has a beginning digit in hundred's.

7, 442 is greater than 0748…**7,442 > 748**

## Compare Decimal Numbers

To compare decimals, first consider the whole numbers. If the **whole numbers are different**, then the comparison can be determined by the whole number. If the whole numbers are the same, then begin with the tenths place of the decimal to compare.

Compare the following pairs of numbers.

*Example 5*:

123.56 and 32.76

Compare the whole numbers, 123 and 32. We can see that 123 is greater than 32.

123.56 is greater than 32.76…**123.56 > 32.76**

To think more about this comparison, write the two decimal numbers as mixed fractions:

$$123\frac{56}{100} > 32\frac{76}{100}$$

When the whole number components of decimal numbers are different, the decimal component (or its equivalent fraction) does not affect the comparison of the entire number.

To compare decimals, with the **same whole numbers**, the comparison begins with tenths place.

*Example 6*:

123.56 and 123.76

Notice that the whole numbers are the same, so begin the comparison with tenth's place. Compare the first digits to the right of the decimal, in other words, compare tenth's place. Compare the 5 and the 7. The 5 is less than 7.

123.56 is less than 123.76…**123.56 < 123.76**

*Example 7*:

45.028 and 45.023

Notice that the whole numbers are the same, so begin the comparison with tenth's place. The digits, both zeros, are the same in tenth's place. Move down to hundredth's place. Again, the digits, both two's, are the same in hundredth's place. Move down to thousandth's place. Compare the 8 and the 3. The 8 is greater than 3.

45.028 is greater than 45.023…**45.028 > 45.023**

*Example 8*:

5.6 and 5.28

Notice that the whole numbers are the same, so begin the comparison with tenth's place. Compare the 6 and the 2. The 6 is greater than 2.

5.6 is greater than 5.28…**5.6 > 5.28**

## Rounding Whole Numbers

Rounding is approximating the value of a number to another number to make estimates easier to calculate.

Follow these steps to round a whole number:

1. First, find the place-value to which you will round and underline it.
2. Second, look at the digit to the right of the underlined digit.
3. If the digit to the right of the underlined digit is 5 or greater, the underlined digit will increase by 1. However, if the digit to the right of the underlined digit is less than 5, the underlined digit will stay the same.
4. Finally, replace all the digits to the right of the underlined digit with zeros.

*Example 1*: Round 567,213 to the nearest thousand.

| | | |
|---|---|---|
| 56<u>7</u>,213 | *Step 1*: | Find the place value position and underline it. The 7 is in thousand's place. |
| 56<u>7</u>,213 | *Step 2*: | Look at the digit to the right of the 7 which is 2. |
| 56<u>7</u>,213 | *Step 3*: | If it is 5 or greater, it will increase by 1. If it is less than 5, it will stay the same. It is 2, and 2 is less than 5; therefore, it will stay the same. |
| 567,000 | *Step 4*: | Replace all the digits after thousand's place with zeros. |

*Example 2*: Round 34,856,130 to the nearest million.

| | |
|---|---|
| 34,856,130 | *Step 1*: The 4 is in million's position. |
| 34,856,130 | *Step 2*: Look at the digit to the right of the 4 which is 8. |
| | *Step 3*: The 8 is greater than 5; therefore, million's place must increase by 1 to become a 5. |
| 35,000,000 | |
| | *Step 4*: Then, replace all the digits after million's place with zeros. |

*Example 3*: Round the following numbers to the nearest ten.

| | | | |
|---|---|---|---|
| 4 | rounds to | 0 | because 4 is less than 5. |
| 8 | rounds up to | 10 | because 8 is greater than 5. |
| 32 | rounds to | 30 | because 2 is less than 5. |
| 257 | rounds up to | 260 | because 7 is greater than 5. |
| 3,481 | rounds to | 3,480 | because 1 is less than 5. |
| 678,699 | rounds up to | 678,700* | because 9 is greater than 5. |

* *This rounding is carried over to hundred's place because 9 is the highest single digit.*

*Example 4*: Round the following numbers to the nearest hundred.

| | | | |
|---|---|---|---|
| 136 | rounds to | 100 | because 3 is less than 5. |
| 2,483 | rounds up to | 2,500 | because 8 is greater than 5. |
| 44,753 | rounds up to | 44,800 | because of the 5. |
| 324,502 | rounds to | 324,500 | because 0 is less than 5. |

*Example 5*: Round the following numbers to the nearest thousand.

| | | | |
|---|---|---|---|
| 12,432 | rounds to | 12,000 | because 4 is less than 5. |
| 543,875 | rounds up to | 544, 000 | because 8 is greater than 5. |
| 2,098,453 | rounds to | 2,098,000 | because 4 is less than 5. |
| 4,987 | Rounds up to | 5,000 | because 9 is greater than 5. |

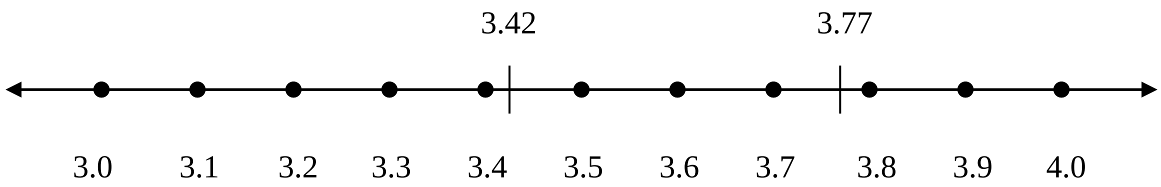
*Example 6*: Round the following numbers to the nearest ten thousand.

| | | | |
|---|---|---|---|
| 43,734 | rounds to | 40,000 | because 3 is less than 5. |
| 76,292 | rounds up to | 80,000 | because 6 is greater than 5. |

*Example 7*: Round the following numbers to the nearest million.

| | | | |
|---|---|---|---|
| 3,890,132 | rounds up to | 4,000,000 | because 8 is greater than 5. |
| 12,344,989 | rounds to | 12,000,000 | because 3 is less than 5. |
| 177,034,888 | rounds to | 177,000,000 | because 0 is less than 5. |
| 7,989,005 | rounds up to | 8,000,000 | because 9 is greater than 5. |

## Rounding Decimals




Looking at a number line helps to round a decimal number.

Look at the location of 3.42 on the number line.  It is closer to 3.4 than 3.5, so 3.42 rounds to 3.4 to the nearest tenth.

Look at the location of 3.77 on the number line.  It is closer to 3.8 than 3.7, so 3.77 rounds to 3.8 to the nearest tenth.

Here is another way to round a decimal without locating the number on a number line.

*Example 1*: Round 3.42 to the nearest tenth.

1. Locate the place to which you are rounding.
   In this case, locate tenth's place. 3.42

2. Look at the number to the right of tenth's place. 3.42

> Use this test:
>
> If the number is 5 or more, round the place that is being rounded up to the next digit. Then **drop** the digits to the right of this place.
>
> If the number is less than 5, then the digit in the place that is being rounded remains the same. Then **drop** the other digits to the right of this place.

3. Since 2 is less than 5, tenth's place remains the same. Drop the digits to the right of tenth's place.

To the nearest tenth, **3.42 rounds to 3.4**.

*Example 2*: Round 3.77 to the nearest tenth.

1. Locate the place to which you are rounding. 3.77
   In this case, locate tenth's place.

2. Look at the number to the right of tenth's place. 3.77

3. Since 7 is greater than 5, round up the 7 in tenth's place to an 8. Drop the digits to the right of tenth's place.

To the nearest tenth, **3.77 rounds to 3.8**.

*Example 3*: Round 24.625 to the nearest hundredth.

1. Locate the place to which you are rounding. In this case, locate hundredth's place. 24.625
2. Look at the number to the right of hundredth's place. 24.625
3. Since 5 equals 5, round up the 2 in hundredth's place to a 3. Drop the digits to the right of hundredth's place.

To the nearest hundredth, **24.625 rounds to 24.63**.

*Example 4*: Round 24.625 to the nearest tenth.

1. Locate the place to which you are rounding. In this case, locate tenth's place. 24.625
2. Look at the number to the right of tenth's place. 24.625
3. Since 2 is less than 5, tenth's place remains the same. Drop the digits to the right of tenth's place.

To the nearest tenth, **24.625 rounds to 24.6**.

*Example 5*: Round 463.82 to the nearest whole number.

1. Locate the place to which you are rounding. In this case, locate one's place. 463.82
2. Look at the number to the right of one's place. 463.82
3. Since 8 is greater than 5, round up the 3 in one's place to a 4. Drop the digits to the right of one's place. In this case, the decimal point is no longer needed after the number is rounded.

To the nearest whole number, **463.82 rounds to 464**.

## FIT (Federal Income Tax)

Anyone who makes over a certain amount of money in a year must file a federal tax return. Instruction booklets provide tax tables to use in computing yearly federal income tax.

Take a look at the example below.

*Example*: Mary is single and must file a federal tax return. Mary earned $26,842. She can find the tax she owes by locating her earnings in the table. Follow steps to find Mary's federal income tax.

*Note: This tax table will be used to solve some problems in the Questions and Answers area of this unit.

*Step 1*: Look at the left side of the table. Locate the row that contains Mary's earnings.

$26,842 is at LEAST $26,800 but LESS than $26,850.

Mary is single.

*Step 2*: Look at the top of the table. Locate the column that indicates her filing status.

*Step 3*: The amount of tax is at the intersection of the row and column.

**Mary's federal income tax is $3,666.**

| If line 42 (taxable income) is— | | And you are— | | | |
|---|---|---|---|---|---|
| At least | But less than | Single | Married filing jointly * | Married filing sepa-rately | Head of a house-hold |
| | | Your tax is— | | | |
| 26,000 | | | | | |
| 26,000 | 26,050 | 3,546 | 3,189 | 3,546 | 3,394 |
| 26,050 | 26,100 | 3,554 | 3,196 | 3,554 | 3,401 |
| 26,100 | 26,150 | 3,561 | 3,204 | 3,561 | 3,409 |
| 26,150 | 26,200 | 3,569 | 3,211 | 3,569 | 3,416 |
| 26,200 | 26,250 | 3,576 | 3,219 | 3,576 | 3,424 |
| 26,250 | 26,300 | 3,584 | 3,226 | 3,584 | 3,431 |
| 26,300 | 26,350 | 3,591 | 3,234 | 3,591 | 3,439 |
| 26,350 | 26,400 | 3,599 | 3,241 | 3,599 | 3,446 |
| 26,400 | 26,450 | 3,606 | 3,249 | 3,606 | 3,454 |
| 26,450 | 26,500 | 3,614 | 3,256 | 3,614 | 3,461 |
| 26,500 | 26,550 | 3,621 | 3,264 | 3,621 | 3,469 |
| 26,550 | 26,600 | 3,629 | 3,271 | 3,629 | 3,476 |
| 26,600 | 26,650 | 3,636 | 3,279 | 3,636 | 3,484 |
| 26,650 | 26,700 | 3,644 | 3,286 | 3,644 | 3,491 |
| 26,700 | 26,750 | 3,651 | 3,294 | 3,651 | 3,499 |
| 26,750 | 26,800 | 3,659 | 3,301 | 3,659 | 3,506 |
| 26,800 | 26,850 | 3,666 | 3,309 | 3,666 | 3,514 |
| 26,850 | 26,900 | 3,674 | 3,316 | 3,674 | 3,521 |
| 26,900 | 26,950 | 3,681 | 3,324 | 3,681 | 3,529 |
| 26,950 | 27,000 | 3,689 | 3,331 | 3,689 | 3,536 |

Mary's earnings →

Mary's federal income tax

## The United States Time Zones

The map shows time zones across the United States. From east to west the 7:00 AM in Florida (breakfast time for most people) , it is 4:00 AM in California (most people are still sleeping).

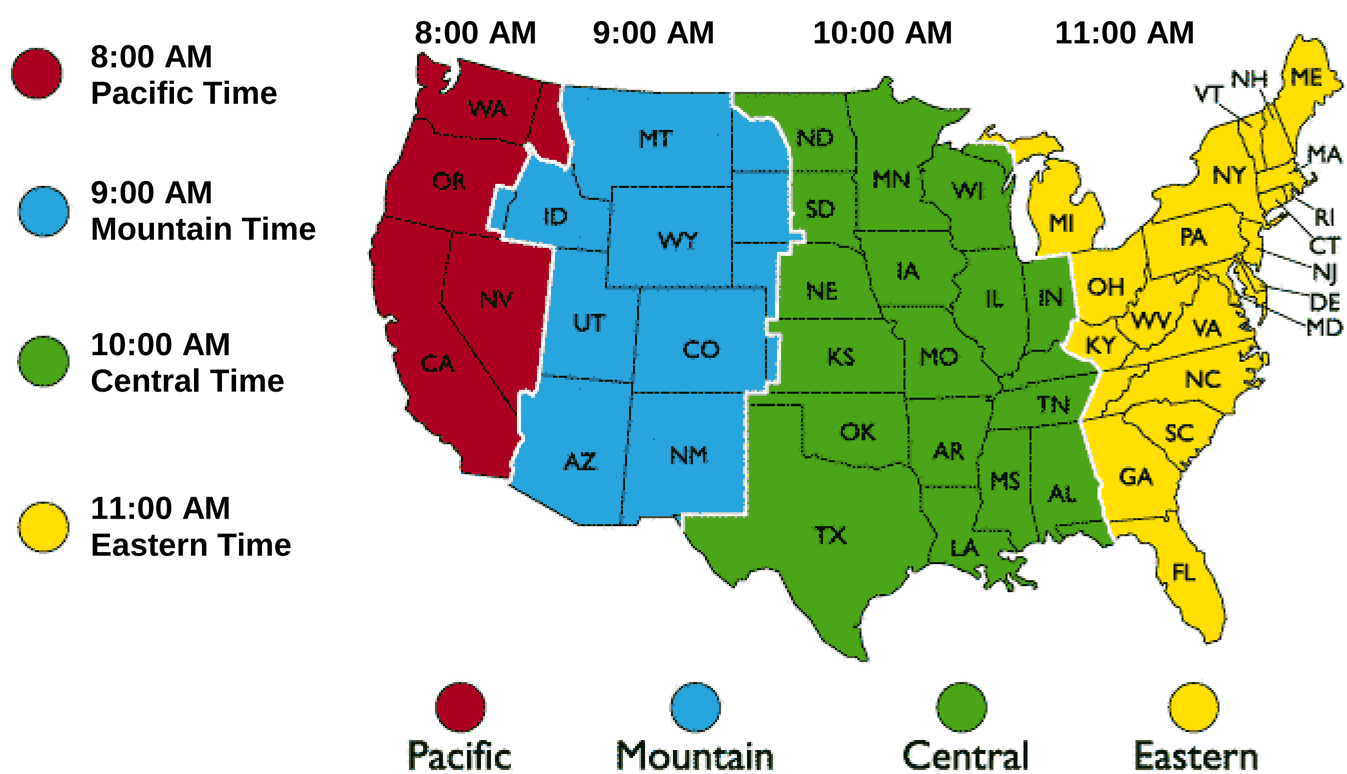
*Example 1*: Mr. Williams owns a construction company. He locates jobs all over the United States. Mr. Williams makes a call from Ohio to Colorado at 11:00 AM Eastern Standard Time. What time is it in Colorado?

Cross two time zones going from East to West.

9:00 AM ← 10:00 AM ← 11:00 AM

It is 9:00 AM in Colorado when it is 11:00 AM in Ohio.

Think: Subtract two hours. (11:00 – 2 hours = 9:00)



*Example 2*: The Super Bowl begins at 2:00 PM in California on the West coast. What time will the game begin on the East coast?

Cross three time zones going from West to East.

3:00 PM → 4:00 PM → 5:00 PM → 6:00 PM

Think: Add three hours (3:00 + 3 hours = 6:00 PM)

The game will begin at 6:00 PM on the East Coast.