DECIMALS

The following table shows decimal place values to the right of the decimal point.

<table>
<thead>
<tr>
<th>THOUSANDS</th>
<th>HUNDREDS</th>
<th>TENS</th>
<th>ONES</th>
<th>TENTHS</th>
<th>HUNDREDTHS</th>
<th>THOUSANDS</th>
<th>TEN THOUSANDS</th>
<th>HUNDRED THOUSANDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000</td>
<td>100</td>
<td>10</td>
<td>1</td>
<td>0.1</td>
<td>0.01</td>
<td>0.001</td>
<td>0.0001</td>
<td>0.00001</td>
</tr>
</tbody>
</table>

Decimals point

The ones column can be thought of as the middle column, with columns larger than 1 to the left and smaller than 1 to the right. The first column to the right of the ones column is the tenths column, the next column to the right is the hundredths column, the next is the thousandths column, and so on. The decimal point is always written between the ones column and the tenths column.

We can use the place value of decimals to write them in expanded form.

**EXAMPLE 1** Write 423.576 in expanded form.

**SOLUTION**

\[ 423.576 = 400 + 20 + 3 + \frac{5}{10} + \frac{7}{100} + \frac{6}{1000} \]

**EXAMPLE 2** Write each number in words.

a. 0.4
b. 0.04
c. 0.004

**SOLUTION**

a. 0.4 is “four tenths.”
b. 0.04 is “four hundredths.”
c. 0.004 is “four thousandths.”

When a decimal fraction contains digits to the left of the decimal point, we use the word “and” to indicate where the decimal point is when writing the number in words.

**EXAMPLE 3** Write each number in words.

a. 5.4
b. 5.04
c. 5.004

**SOLUTION**

a. 5.4 is “five and four tenths.”
b. 5.04 is “five and four hundredths.”
c. 5.004 is “five and four thousandths.”

**EXAMPLE 4** Write 3.64 in words.

**SOLUTION** The number 3.64 is read “three and sixty-four hundredths.” The place values of the digits are as follows:

\[ \begin{array}{c|ccc}
\hline
& \text{3 ones} & \text{6 tenths} & \text{4 hundredths} \\
\hline
\end{array} \]
**Rounding Decimals** — Same as rounding whole numbers

**Example:** Round $53.2658$ to the nearest hundredths

We locate the hundredths digit (the "6") and then look at the digit to its right (the thousandths digit = "8")

Since it is a "5" or greater, we go up 1 in the hundredths place (to "7") and throw away the rest of the digits (the "5" and the "8")

$53.2658 \rightarrow 53.27$

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**Ordering Numbers**

Using $>$, $<$ knowing which number is bigger

**Example:**

$5.7 \underline{?} 5.016$

If whole parts are different, compare them ignoring decimals

If whole parts are the same, then look at decimals

If number of decimal parts are not the same in each number, then extend the shorter number with zeros on the right until it is the same length as other number.

$5.700 \underline{?} 5.016$

Extended with zeros

Now compare the two sets of decimal digits:

In this case, 700 looks bigger than 016

So we put $>$ in the box:

$5.700 \underline{>} 5.016$
IN CLASS WORK

1) pg 297
   #13) What is the place value of the "3" in the number 8.57932

2) pg 297
   #16) Write the number 23.056 in words

3) pg 299
   #46) Round 52.8728 to the nearest thousandths

4) pg 298
   #28) Fill in the blank with <, > to order the numbers
   2.451 ___ 2.45