Introduction to Whole Numbers

NATURAL NUMBERS:

1, 2, 3, 4, ....

These are also known as the counting numbers.

WHOLE NUMBERS:

0, 1, 2, 3, ....

Note that the set of Whole Numbers is the set of Natural Numbers and zero.

A graph of the Whole Numbers, as seen below, is called a number line.

```
| | | | | | ->
0 1 2 3 4
```

The arrowhead at the right indicates that the line continues to the right.
The solid points indicate that only these values are used, not the values between them (½, 2 ¼, etc.)

When two values on the number line are compared, the value to the right of the other is always greater than any value to its left.

```
| | | | | | ->
0 1 2 3 4
```

Ex. 3 is greater than 2
2 is greater than 0
0 is less than 3
When two or more values are not the same (equal) a state of *inequality* is said to exist. In other words, one value must be greater than the other or one value is less than the other. The symbols to express these conditions are:

- $>$ is the symbol for greater than
- $<$ is the symbol for less than

**Examples:**

1) $5 > 3$  
   5 is greater than 3

2) $3 < 5$  
   3 is less than 5

**Place Values**

When a whole number is written using the digits 0 → 9 it is said to be in the *standard form*. The position that each digit occupies determines its *place value*.

<table>
<thead>
<tr>
<th>Digit</th>
<th>Place Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 millions</td>
<td></td>
</tr>
<tr>
<td>10 millions</td>
<td></td>
</tr>
<tr>
<td>1 millions</td>
<td></td>
</tr>
<tr>
<td>100 thousands</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>10 thousands</td>
</tr>
<tr>
<td>4</td>
<td>1 thousands</td>
</tr>
<tr>
<td>2</td>
<td>hundreds</td>
</tr>
<tr>
<td>7</td>
<td>tens</td>
</tr>
<tr>
<td>3</td>
<td>ones</td>
</tr>
</tbody>
</table>
This number can be written in what is called the *expanded form*, shown below:

<table>
<thead>
<tr>
<th>6 10 thousands</th>
<th>60,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 1 thousands</td>
<td>4,000</td>
</tr>
<tr>
<td>2 hundreds</td>
<td>200</td>
</tr>
<tr>
<td>7 tens</td>
<td>70</td>
</tr>
<tr>
<td>3 ones</td>
<td>3</td>
</tr>
</tbody>
</table>

When a comma separates one group of 3 digits from another, these groups are known as *periods*.

*Ex.* 2, 374, 741 has three periods
741 is the “Ones” period
374 is the “Thousands” period
2 is the “Millions” period

**Rounding**

*Rounding* is giving an approximate value for an exact number.

*Ex.* Round 48 to the nearest 10.

Soln. Since 48 is only two values from 50 as opposed to eight values from 40, the answer is 50

*Ex.* Round 22,748 to the nearest:

1.) Hundreds 22,700
2.) Ten     22,750
3.) Thousand 23,000
4.) Ten Thousand 20,000