SWBAT solve and graph inequalities.

Do Now: Name each of the following symbols and give an example of when they could be used in real life

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;</td>
<td>less than</td>
</tr>
<tr>
<td>&gt;</td>
<td>greater than</td>
</tr>
<tr>
<td>≤</td>
<td>less than or equal to</td>
</tr>
<tr>
<td>≥</td>
<td>greater than or equal to</td>
</tr>
</tbody>
</table>

A math sentence that contains <, >, or is called an inequality.

### Common Phrases and Corresponding Inequalities:

- **<** (less than)
  - is less than
  - is fewer than
  - exceeds
- **>** (greater than)
  - is greater than
  - is more than
- **≤** (less than or equal to)
  - is less than or equals
  - is at most
- **≥** (greater than or equal to)
  - is greater than or equals
  - is at least

When graphing, use an open point for **<** or **>**.

When graphing, use a closed point for **≤** or **≥**.

To solve an inequality, treat it as if it were an equation.

Follow the same steps you followed for solving an equation, "undo" whatever is being done to the variable. In an equation the variable is equal to only 1 number. However, in an inequality there are an infinite number of solutions.

**Example:**

Solve the inequality: \( x + 7 < 4 \)

Graph the solution:
Where have you seen inequalities used before?
The lowest temperature ever recorded in Florida was -2°F.

1) Graph this temperature on the number line below by plotting at this location.

2) The temperatures 0°F, 3°F, 6°F, 5°F, and -1°F have also been recorded in Florida. Graph these temperatures on the number line above.

3) How do these temperatures compare to -2?

4) How can you see this relationship on the number line?

5) How many other numbers have the same relationship to -2 as the temperatures in question #2? Give some examples.

   How many? infinitely many Examples: $\infty$, -1, 0, 3, 5, 6

6) Suppose you could graph all of the possible answers to question #5 on a number line. What do you think the graph look like?

7) Let the variable $x$ represent any of the possible answers to #5.

   Complete this inequality: $x \geq -2$

When an inequality contains a variable, a solution of that inequality is any value of the variable that makes the inequality true.

Ex. 7 is a solution of $x > -2$, since 7 > -2 is a true statement.

The numbers you listed in question #5 are solutions of the inequality $x > -2$. 