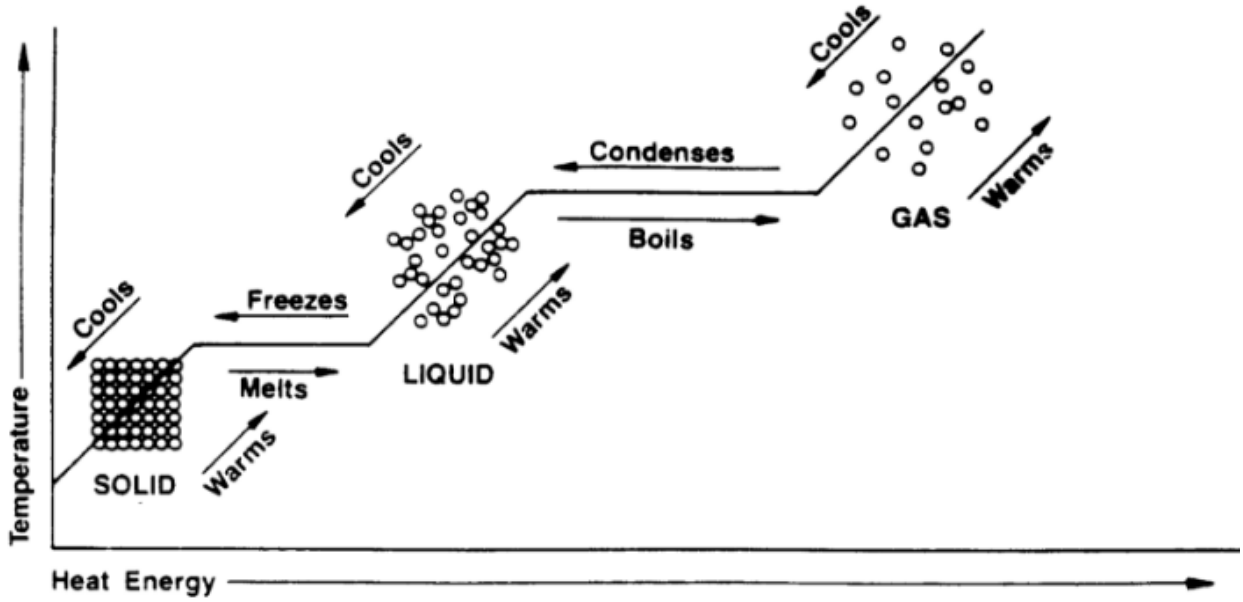
States of Matter Graphs Name:

Period:

You have learned that graphs can show how adding or removing energy can cause changes from one state of matter to another. This information can be shown in more than one way. Now it is time to get some practice reading such different graphs, interpreting them, and writing a clear statement about what the graph means.

Sometimes, a graph can look really complicated. However, if you slow down and don't panic, you can find some really helpful information. Take a look at the one below:



1. Look carefully at the diagram. Pay attention to the little circles that show you what particles look like in a solid, a liquid, and a gas. What differences do you see between how particles are in a solid, compared to how particles are in a gas? Put the following descriptions in the sentence blanks.

close together far apart organized random

In a solid, particles are _____ and _____ .

In a gas, particles are _____ and _____ .

2. Now examine the axes on the graph. Notice that the x-axis is labeled "Heat Energy". As you move from left to right on the x-axis, is there more or less energy? _____ . So, which state of matter must have the most energy, a solid, a liquid, or a gas? _____ . How can you tell this from the graph?

Based upon the graph above, I can tell this because...

3. Remember how much energy you have after enjoying a Monster Drink or Red Bull, or anything with a lot of sugar? How you just run around screaming and waving your arms like Kermit the Frog? Keeping this example in mind, in which state are the particles moving the fastest, in a solid, in a liquid, or in a gas?

Particles are moving fastest in a _____ . Based upon the graph above, I can tell this because...

Practice: 18 points

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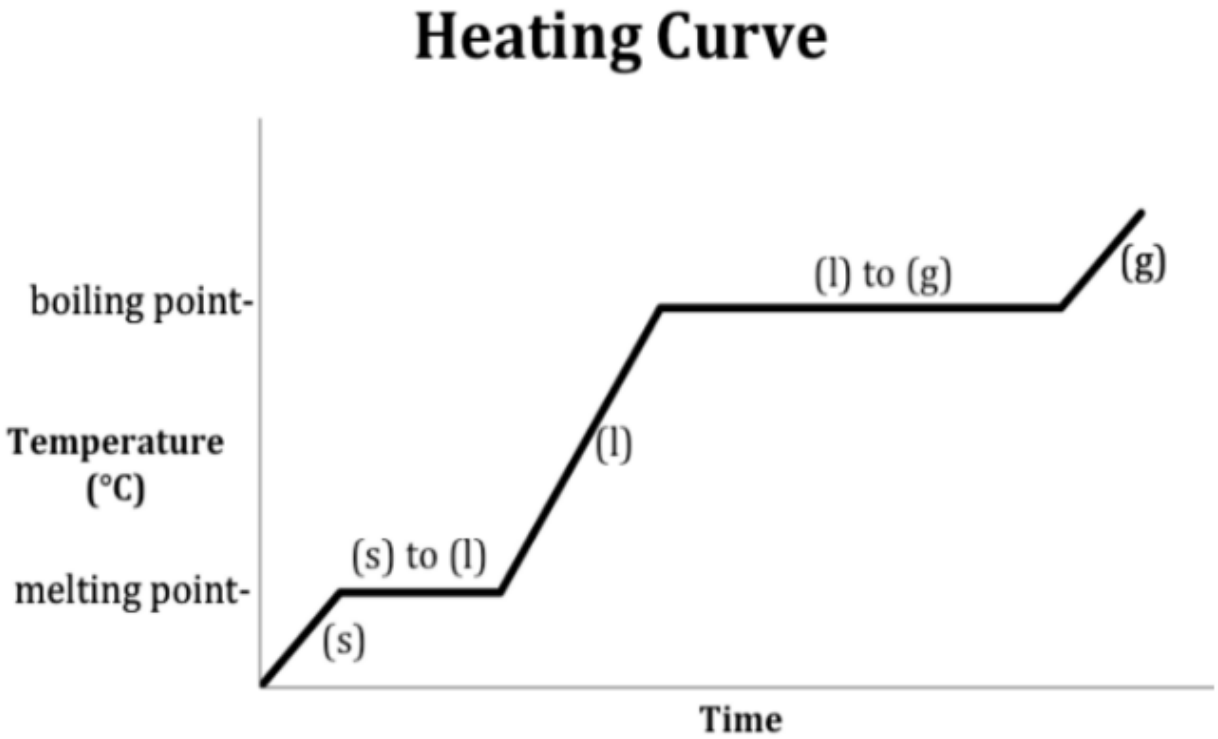
Hooray! More incredibly evil graph interpretation questions!



4. AAAUUGH! There are codes on this one that no-one told you about! Relax. Use your brain. You already know that this graph has something to do with states of matter, so…

The (s) on the graph must stand for _____ .

The (l) on the graph must stand for _____ .

The (g) on the graph must stand for _____ .

5. Notice that the x-axis represents time. Which change takes more time, going from a solid to a liquid, or a liquid to a gas? _____ . How can you tell this from the graph?

6. Why does this change take longer? *Hint: does it take more energy to move a little or to move a lot?*

7. Now look at the y-axis. It is showing temperature. Does it take more energy to melt ice or to boil water? *Hint: which can you do with just the heat of your hand—melt ice or boil water?*

8. So… which would take more energy to change from one state to another? More energy to change from a solid to a liquid, or from a liquid to a gas? _____ . How can you tell this from the graph?

Practice: 18 points