

# Graphing Skills

## Line Graphs and Laboratory Experiments

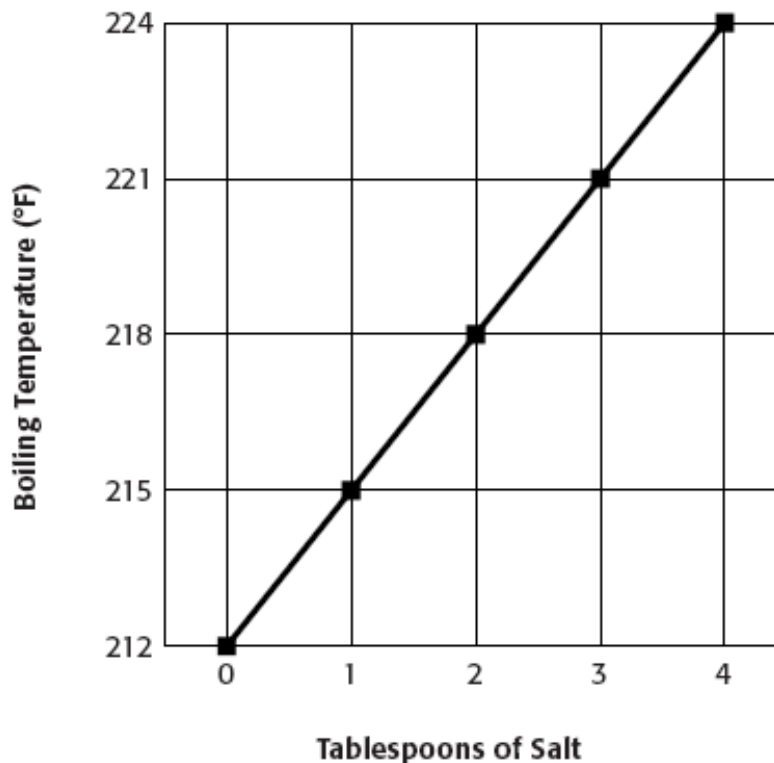
In a laboratory experiment, you usually control one variable (the independent variable) to determine its effect on another variable (the dependent variable). Line graphs are useful for showing the relationship between variables in a laboratory experiment.

For example, you might perform an experiment in which you measure the temperature at which a quart of water boils when salt is added to the water. In this case, temperature is the dependent variable, and the amount of salt being added — a total of 4 Tbsp — is the independent variable.

The independent variable is plotted on the  $x$ -axis and labeled “Salt (Tbsp.),” with a range of 1 to 4. The dependent variable is plotted on the  $y$ -axis and is labeled “Temperature ( $^{\circ}$ F),” with a range of 212 to 224 $^{\circ}$ F.

A grid has lines running horizontally from the  $y$ -axis and vertically from the  $x$ -axis. To plot a point, you would: 1) find the  $x$  value on the  $x$ -axis; 2) follow the vertical line from the  $x$ -axis until it intersects the horizontal line from the  $y$ -axis at the corresponding  $y$  value; 3) place the point at the intersection of these two lines.

The line graph below shows how the data would be graphed for the hypothetical experiment mentioned above.



**Graphing Skills *continued***

**PRACTICE**

Use the line graph above to answer the following questions.

1. At approximately what temperature would a quart of water with 3 Tbsp of salt boil?  
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2. How many tablespoons of salt would cause the water to boil at 217.4°F?  
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3. At approximately what temperature would a quart of water with 4 Tbsp of salt boil?  
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4. Predict the approximate temperature at which a quart of water with 5 Tbsp of salt would boil.  
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5. Let's say you want to conduct an experiment that measures the volume of a gas at different temperatures. Use the data table below to create a line graph that shows how volume is related to temperature, with temperature as the independent variable.

Temperature (K)	Gas Volume (L)
0	0.0
200	0.7
400	1.4
800	2.8
