

**PERFORMANCE ASSESSMENT****Balloon Graph****◆ Problem**

In helping a scientist analyze data from an experiment to determine how the volume of a gas changes with temperature, you inflated a large balloon and then measured its volume at various temperatures. How can you make a graph to help analyze the data?

**◆ Suggested Materials**

ruler

graph paper

colored pens or pencils

**◆ Devise a Plan**

1. Study the table below and determine how you could use this data to show the relationship between the temperature of a gas and its volume.

Temperature (°C)	Volume (L)	Temperature (°C)	Volume (L)
-40	0.77	100	1.23
-20	0.83	120	1.30
0	0.90	140	1.36
20	0.97	160	1.43
40	1.03	180	1.80
60	1.10	200	1.56
80	1.17	220	1.63

2. Use appropriate scales for the axes of your graph. Plot each of the data points and connect them with a line. Give your graph an appropriate title.

**◆ Analyze and Conclude**

*After following the plan you devised, answer the following questions on a separate sheet of paper.*

1. Does a decrease in temperature result in an increase or a decrease in the volume of the gas?
2. Predict the volume in the balloon at  $-60^{\circ}\text{C}$  and at  $240^{\circ}\text{C}$ .
3. You think you made an error when recording one of your pieces of data. Which measurement seems to be incorrect? How could you check this measurement?
4. What change in volume of the balloon is observed between  $0^{\circ}\text{C}$  and  $60^{\circ}\text{C}$ ?