

INTRODUCING THE SKILL

Interpreting Data

Suppose your class is planning a party. You don't have lots of money to spend, so you're looking for bargains as you buy the food, drinks, and decorations. For example, you can buy soft drinks in separate cans, in packs of six cans, or in one-liter bottles. Some stores are having sales, and you also have a few money-saving coupons. To figure out the best price, you would first have to decide how many soft drinks you need, list all the price information you have, and then compare the various choices. That's similar to what you do when you analyze data in a science investigation.

During a science investigation, you make observations and take measurements that are called **data**. For example, you might observe color changes in a liquid or measure the temperature of objects left out in a sunny spot. After you collect your data, you need to interpret—or find meaning in—the data by looking for patterns or trends.

Suppose that scientists recorded the temperature at a specific location on Earth's surface. After that, they drilled below the surface to collect temperatures at different depths. The results of their work are shown in the table below.

Depth (km)	Temperature (°C)
0	15
1	52
2	88
3	120
4	151
5	179
6	206
7	232
8	257

By looking at the table, you can see that the deeper the location of the measurement, the higher the temperature. But it's hard to find any more details about that trend by just examining the table. So you decide to graph the data.

Interpreting Data (*continued*)

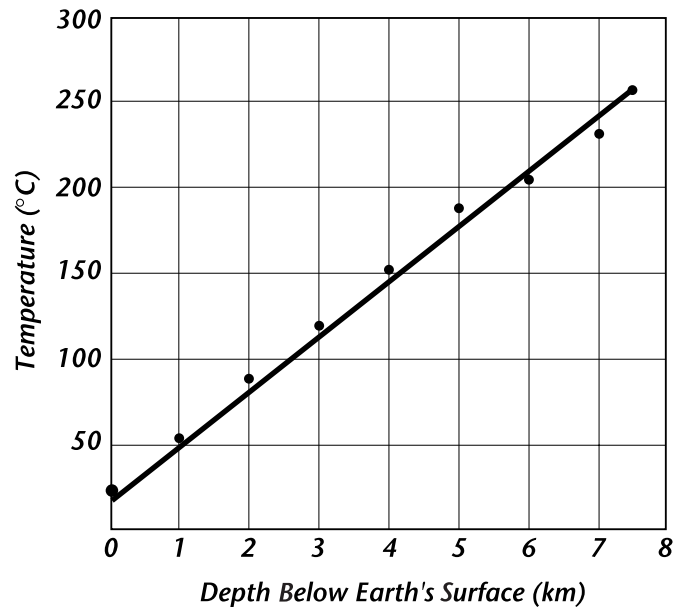
You could use the data to create a graph like this one. You could then interpret the graph and make inferences like the ones that follow.

Example 1: The deeper the location of the temperature reading beneath Earth's surface, the hotter the temperature is.

Example 2: For every additional kilometer of depth, the temperature increases about 30 Celsius degrees.

Example 3: The temperature at a depth of 3.5 km would be about 135°C.

To determine whether your interpretation of the data is logical, you compare it with what you already know. You know that lava from inside Earth sometimes erupts from volcanoes, and that lava is extremely hot. You decide your interpretation of the data makes sense.



Tips for Interpreting Data

- ◆ Organize the data into a table or arrange the data in a specific order, such as largest to smallest. If applicable, make calculations such as adding, subtracting, or finding averages.
- ◆ Make a graph of the data.
- ◆ Look for trends or patterns in the data or graph.
- ◆ Make one or more inferences from the data. Then compare the inferences with what you already know about the topic.
- ◆ If your inferences seem to contradict what you know, review your work to see whether you made any errors or need to examine the data again.

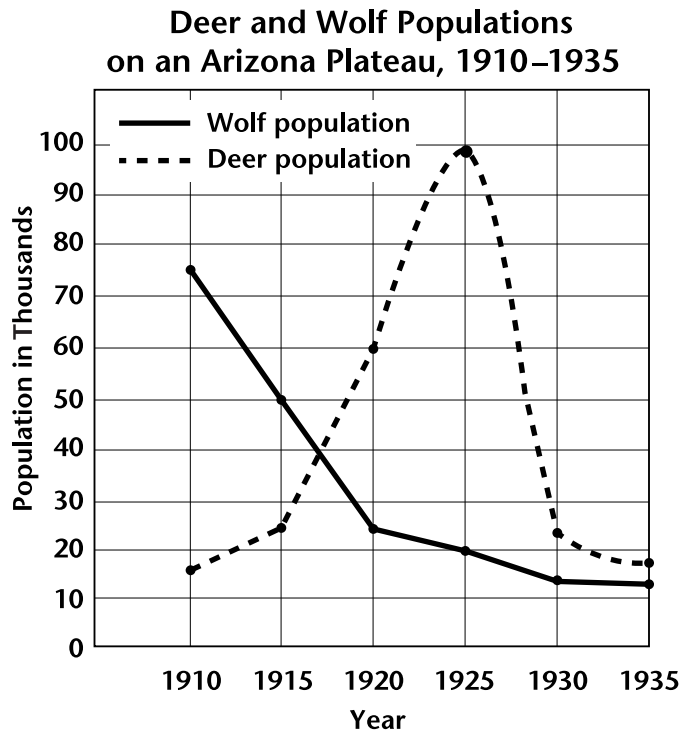
Checkpoint Could you use the data about temperatures beneath Earth's surface to predict the temperature at 9 km beneath Earth's surface? Explain your reasoning.

SKILLS PRACTICE

Interpreting Data

Answer the following questions on the back of this page or on a separate sheet of paper.

This graph presents data that were collected over a 25-year period in a region of Arizona.



1. Start by summarizing the data. Using the title and the axis labels as a guide, write a sentence describing what the data show.
2. Examine the wolf graph. How big was the wolf population in 1910?
(*Hint:* Remember to multiply the numbers on the vertical axis by 1,000.)
3. What does the shape of the wolf graph tell you about the wolf population from 1910 to 1935?
4. Examine the deer graph. How big was the deer population in 1910?
5. What does the shape of the deer graph tell you about the deer population from 1910 to 1935?
6. List two other facts that you can learn from the graph.
7. How can the changes shown in this graph be explained?
8. Does your explanation in Question 7 fit in with what you know about deer and wolves? Explain.
9. Think About It Look back over your work. Make a list of the steps you took as you interpreted the data in the graph.