Interdisciplinary Application
For use with pages 82–89

The Internet

**COMPUTER SCIENCE** The Internet has become a major tool for any institution that uses computers. Indeed, some businesses do nothing but work in designing material to be exchanged over the Internet through the World Wide Web (WWW). To transmit information on the WWW, designers and programmers must translate the information into a special computer language known as HTML (Hypertext Markup Language), thus making it available for others to view.

One of the major concerns of these WWW designers is the concept of load time—the time it takes for a computer to transfer an entire document from one computer to another. There are many factors that influence this speed-of-transfer, but the most obvious is the length of the document. Longer documents take longer to transfer.

**In Exercises 1–6, use the following information.**

Suppose you were starting a company that wanted to provide complete works of literature over the Internet for English classes to use. The following questions have to do with some decisions you will have to make in setting up your business.

The HTML programmers gathered some sample novels and calculated that, if \( x \) is the number of words in a novel and \( y \) is load time of the novel (in seconds), then the relationship between the two is

\[
y = 0.003x + 2.2.
\]

1. What is the slope of the line given by this equation?
2. Using your own words, say what the slope represents.
3. What is the \( y \)-intercept of this equation?
4. Using your own words, say what the \( y \)-intercept represents.
5. Write the equation in standard form.
6. Graph the equation.

**In Exercises 7–11, calculate the load times of the following works of literature using the given word counts.**

7. *Gulliver's Travels* by Jonathan Swift: 106,014 words
8. *Flatland* by Edwin Abbot: 14,784 words
10. Research has determined that users will not want to wait more than 60 seconds for a document to load. Which of the works in Exercises 7, 8, and 9 will load in this time?
11. What would you suggest as a remedy for pages that take too long to load?
Nutrition

**HEALTH** Nutritionists examine many common foods to determine the content of several important substances. For people on restricted diets, this information is vital to healthy living, and food producers are required by law to label their foods with these numbers.

For example, many people monitor their intake of fats and sodium. Sources of these ingredients in everyday meals include cooking oils, salad dressings, and other condiments. The amounts of calories, fat, saturated fat, and sodium for one tablespoon of several of these items is given in the following table:

<table>
<thead>
<tr>
<th>Type</th>
<th>Calories</th>
<th>Fat (g)</th>
<th>Saturated Fat (g)</th>
<th>Sodium (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butter (salted)</td>
<td>100</td>
<td>11</td>
<td>7.1</td>
<td>116</td>
</tr>
<tr>
<td>Margarine (salted)</td>
<td>100</td>
<td>11</td>
<td>2.2</td>
<td>132</td>
</tr>
<tr>
<td>Olive Oil</td>
<td>125</td>
<td>14</td>
<td>1.9</td>
<td>0</td>
</tr>
<tr>
<td>Bleu Cheese Dressing</td>
<td>75</td>
<td>8</td>
<td>1.5</td>
<td>164</td>
</tr>
<tr>
<td>French Dressing (Regular)</td>
<td>85</td>
<td>9</td>
<td>1.4</td>
<td>188</td>
</tr>
<tr>
<td>French Dressing (Low Calorie)</td>
<td>25</td>
<td>2</td>
<td>0.2</td>
<td>306</td>
</tr>
<tr>
<td>Italian Dressing</td>
<td>80</td>
<td>9</td>
<td>1.3</td>
<td>162</td>
</tr>
<tr>
<td>Mayonnaise</td>
<td>100</td>
<td>11</td>
<td>1.7</td>
<td>80</td>
</tr>
</tbody>
</table>

1. First, consider the columns labeled **Fat** and **Saturated Fat**.
   a. Graph the data in the two columns with **Fat** on the x-axis and **Saturated Fat** on the y-axis.
   b. Is this graph the graph of a function? Explain why or why not.
   c. Do you notice any points that seem to "stick out" from the rest of the data? Which types of food do these points represent?
   d. Suppose you were cooking a chicken dish for someone who wants their saturated fat intake to be less than two grams. Which of these items would be okay to include in the recipe?

2. Consider the relationship between **Sodium** and **Calories**.
   a. Graph the data with **Calories** on the x-axis and **Sodium** on the y-axis.
   b. Is this graph the graph of a function? Explain why or why not.
   c. Do you notice any points that seem to "stick out" from the rest of the data? Which types of food do these points represent?
   d. Suppose you were supervising the diet of clients who needed to reduce their sodium intake. If you were to recommend two items from the list, which two would they be?