## 3.6 <br> Communicating about Graphs

## GOAL

Use data and graphs to support conclusions.

## Communicate about the Math

Kayley researched the spending and saving habits of 13-year-olds to convince her mother that she needs an increase in her allowance. She surveyed 10 of her classmates and reported the average amounts. Then she used a spreadsheet and a graph to present her findings in a report. She asked Carina to comment on her report.

## $?$

How can Kayley improve her report?

Kayley's Report

| Allowance | Amount <br> earned | Amount <br> spent on <br> entertainment | Amount <br> spent on <br> food | Amount <br> spent on <br> clothes | Amount <br> spent on <br> CDs | Amount <br> saved |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\$ 960$ | $\$ 500$ | $\$ 425$ | $\$ 450$ | $\$ 200$ | $\$ 175$ | $\$ 210$ |

Spending Habits of 13 -Year-Olds


I organized the data I collected from my classmates in a spreadsheet. Then I used the $\qquad$ graphing program on my computer to construct a circle graph.

## Carina's Questions

What was the sample size?

Was your sample representative of all 13-year-olds?

How did you use the spreadsheet program?

Why didn't you use a bar graph, a histogram, or a pictograph?

What other conclusions can you make from your graph?
A. Which of Carina's questions do you think is most important for improving Kayley's report? Why?
B. Kayley did not comment on the amount of money that her friends earn or get for allowance. How could she use this information in her report?
C. Why was Kayley's decision to use a graph to communicate her findings appropriate?

## Reflecting

Did you include all the important details?

Did you make reasonable conclusions?
$\square$
Did you justify your conclusions?

Were you convincing?

1. Which parts of the Communication Checklist did Kayley cover well? Explain.
2. What additional suggestions can you make to help Kayley improve her report?

## Work with the Math

## Example: Using a histogram

Rohan wanted to find out how important music is to 13 -year-olds. He conducted a survey and presented his findings in a histogram. Based on his histogram, he concluded that music is very important to 13 -year-olds.
a) How does Rohan's histogram support his conclusion?
b) Why is a histogram an appropriate graph to use?

Importance of Music to 13 -Year-Olds


Hours spent listening to music per week

## Carina's Solution

a) Rohan's histogram shows the distribution of hours that 13-yearolds listen to music over a week. Based on the histogram, I can conclude that most 13-year-olds listen to music for 20 to 40 ha week, with the majority listening to music for 20 to 30 h .
b) A histogram shows a frequency distribution, using intervals on a number line. A circle graph would not be appropriate because Rohan is not showing how a whole is divided. A line graph would not be appropriate either because he is not showing how something changes over time.

## A Checking

3. Kevin produced a report to show the food he ate over a week. He used a circle graph. What questions would you ask Kevin to help him improve his report?
Kevin's Report
Food Servings Eaten in a Week
I constructed a circle graph because
I am showing how something is
divided. I knew that I should not use
a line graph because I am not showing
a change. I included a title, a
legnatives
lenend, and percents on my graph.
I noticed that I eat mostly grain
products and vegetables and fruits.
I think my graph clearly shows this.
and fruit

## B Practising

4. A battery manufacturer is interested in the lifetime of its products. Thirty batteries are tested until they fail. The times to failure (in hours) are given below.

| 41.3 | 21.1 | 35.6 | 13.5 | 4.2 | 15.8 |
| ---: | ---: | ---: | ---: | ---: | ---: |
| 5.5 | 5.8 | 33.6 | 18.6 | 24.3 | 18.1 |
| 3.5 | 8.4 | 42.1 | 9.4 | 10.6 | 8.9 |
| 13.7 | 19.6 | 9.2 | 5.9 | 19.4 | 24.2 |
| 27.3 | 30.6 | 29.4 | 18.0 | 32.8 | 15.6 |

a) Construct a graph to display the data.
b) The manufacturer claims that $50 \%$ of its batteries last longer than 20 h .
Describe how your graph shows whether or not this is true.
5. The countries that won medals in the winter Olympics from 1924 to 2002 are listed in this table.

| Country | Gold | Silver | Bronze |
| :--- | :---: | :---: | :---: |
| Germany/East Germany/ <br> West Germany | 108 | 105 | 87 |
| USSR/Unified Team/ <br> Russia | 114 | 83 | 78 |
| Norway | 94 | 94 | 75 |
| United States | 69 | 72 | 52 |
| Austria | 41 | 57 | 64 |
| Finland | 42 | 51 | 49 |
| Sweden | 39 | 30 | 39 |
| Switzerland | 32 | 33 | 38 |
| Canada | 31 | 28 | 37 |

a) Organize the data to compare the overall medal standings for four regions:
Scandinavia (Sweden, Norway, and Finland), North America (Canada and the USA), the Alps (Switzerland, Austria, Germany, and East and West Germany), and USSR/Unified Team/Russia.
b) Create a graph to display your organized data.
c) Use your graph to predict how the different regions will perform at the next winter Olympics. Explain your prediction.
6. This table shows the population of Earth at various times in the last 250 years.

| Year | Population (billions) |
| :---: | :---: |
| 1750 | 0.80 |
| 1800 | 0.95 |
| 1850 | 1.20 |
| 1900 | 1.70 |
| 1950 | 2.55 |
| 2000 | 6.00 |

a) Construct a graph to display the data.
b) Estimate the population of Earth in 2050. What assumptions did you make?

