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

Amount Amount Amount Amount What was the spent on Amount spent on spent on spent on Amount sample size? Allowance earned entertainment food clothes **CD**s saved \$960 \$500 \$425 \$450 \$200 \$175 \$210 Was your sample Spending Habits of 13-Year-Olds representative of all 13-year-olds? Savings 14% How did you use Entertainment I organized the data I collected CDs the spreadsheet 29% from my classmates in a 12% program? spreadsheet. Then I used the graphing program on my computer Clothes 14% to construct a circle graph. Food Why didn't you 31% use a bar graph, a histogram, or a pictograph? I chose a circle graph to show the spending and saving habits of 13-year-olds because a circle graph shows how something is divided up. I knew that a line graph would not be appropriate What other because I am not showing any change over a time period. conclusions can I gave my graph a title and labelled the sections of the graph with you make from percents. From my graph, I can conclude that 13-year-olds spend your graph? more than they save. -

Carina's Questions

- **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

- **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?

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 h a 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.

Communication Checklist

- Did you include all the important details?
 Did you make reasonable conclusions?
- Did you justify your conclusions?

Importance of Music

to 13-Year-Olds

30-40

Hours spent listening to music per week

40–50 50–60

10-20 20-30

Number of students

35

30

25

20

15

10

0-10

Were you convincing?

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



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/ West Germany	108	105	87
USSR/Unified Team/ 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?