CHAPTER 3

1 Constructing a Pictograph

Goal **Construct and interpret pictographs.**

1. The chart shows some data for you to display in a pictograph.

Bones Collected

Month	Number of bones
June	25
July	50
August	35
September	15

Answers will vary. For example:

a) What symbol will you use to represent the number of bones? a bone

b) How many bones will each symbol represent? 5

c) Make the pictograph. Include the title and the scale.

Bones Collected

June	
July	
August	
September	
	Scale: Each  means 5 bones.

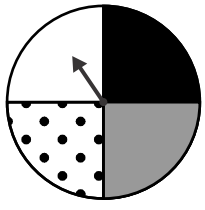
2. **a)** The spinner landed on the spotted section 24 times. Fill in the scale to tell what each circle means.

b) How many times did the spinner land on each of the other sections?

white 15

black 21

grey 12



Number of Times Landed On

white ◯ ◯ ◖

black ◯ ◯ ◯ ◖

grey ◯ ◯

spotted ◯ ◯ ◯ ◯

Each ◯ means 6 times.

At-Home Help

A **pictograph** uses symbols to represent a number of items. For data where the least number of items is 2 and the greatest is 10, the scale could be "Each symbol means 1 item." For data where the least number of items is 20 and the greatest number is 240, the scale could be "Each symbol means 20 items."

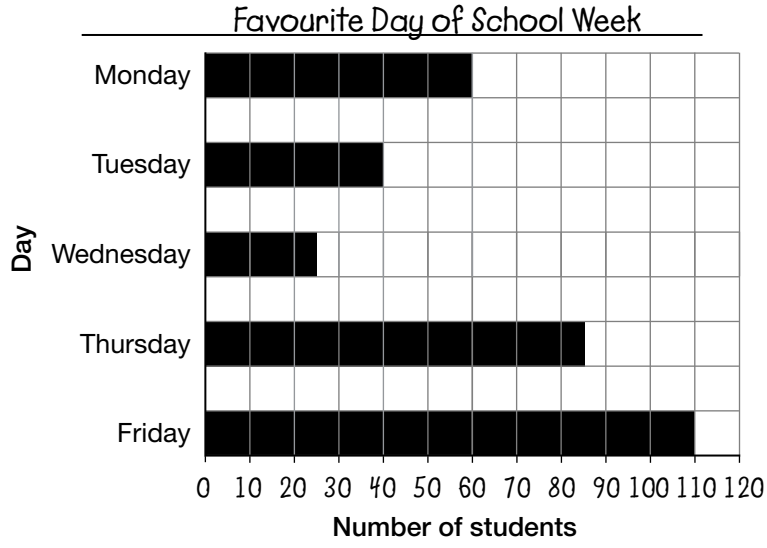
CHAPTER 3

2 Choosing a Scale for a Bar Graph

Goal **Explain how to choose a graph and a scale that are appropriate for the data.**

1. Some students voted on their favourite day of the school week. Complete the bar graph. Choose an appropriate scale and include a title.

Answers will vary. For example:



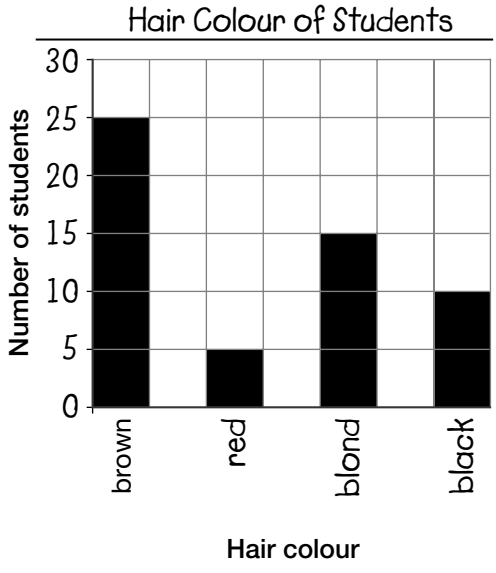
At-Home Help

A **bar graph** uses horizontal or vertical bars to show data. For data where the least number of items is 5 and the greatest is 70, the scale could be each grid line represents 10. Then you would need 7 grid lines to get to 70.

Day	Number of students
Monday	60
Tuesday	40
Wednesday	25
Thursday	85
Friday	110

2. The hair colour of some grade 4 students is shown. Complete the bar graph. Choose an appropriate scale and include a title.

Answers will vary. For example:



Hair colour	Number of students
brown	25
red	5
blond	15
black	10

CHAPTER 3

3 Collecting Data

Goal **Predict results, collect and organize data, and find the range.**

1. Look at the 2 sentences in the At-Home Help box.

a) Predict the number of times that each letter listed in the chart is used in the 2 sentences. Record your prediction in the 2nd column of the chart.

b) Count and record the actual number of times each letter is used. Record your count in the 3rd column of the chart.

At-Home Help

The **range** of data is the difference between the greatest number and the least number in a set of data. If the least number is 11 and the greatest number is 38, the range is 38 − 11, or 27.

Letter	Prediction of times each letter is used	Count of times each letter is used
a	Predictions will vary	13
e		26
i		7
o		3
u		4
c		1
k		0
s		9
t		17

2. **a)** Which letter was used the least number of times? k

How many times was it used? 0

b) Which letter was used the greatest number of times? e

How many times was it used? 26

c) What is the range of the counted data? 26

3. Compare your predictions with what you counted. For which letters were you close? Why might that be? Answers will vary.

CHAPTER 3

4 Constructing a Bar Graph with Intervals

Goal **Construct a bar graph using appropriate intervals for the range of data.**

1. This chart shows data in intervals. Use it to answer the questions.

Hours of computer time used in 1 month	Number of students
1–10	1
11–20	4
21–30	7
31–40	8
41–50	10

At-Home Help

The chart in Question 1 has 5 **intervals**. Intervals for a set of data should always be equal. In this chart, each interval is 10.

a) What is the least number of hours that could have been used? 1 hour

b) What is the greatest number of hours that could have been used? 50 hours

c) How many students were asked? 30

d) Suppose you wanted to show the number of students in each interval on a bar graph. How many bars would you need? 5

2. The list on the right shows how many blocks 30 students were able to stack before their stacks fell over.

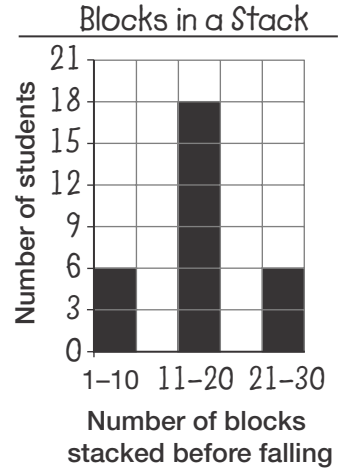
Number of Blocks in a Stack

6	7	8	9	10
10	11	11	12	12
13	14	14	16	16
17	18	18	18	19
19	19	20	20	21
22	23	23	24	24

a) Complete the chart to show the data in intervals.

Number of blocks stacked before falling	Number of students
1–10	6
11–20	18
21–30	6

b) Complete the bar graph on the right using the data from the chart.



CHAPTER 3

5 Reading and Interpreting Graphs

Goal **Read and interpret graphs and identify their features.**

1. Use the pictograph to answer these questions.

Boxes of Food Collected for Charity

week 1 ■ ▮

week 2 ■ ■ ■ ▮

week 3 ■ ■

week 4 ▮

Each ■ means 10 boxes of food.

At-Home Help

The scale in Question 1 is often called a **legend**. The explanation of colours, such as in Question 3, is also called a **legend**.

a) How many boxes were collected in week 2? 35

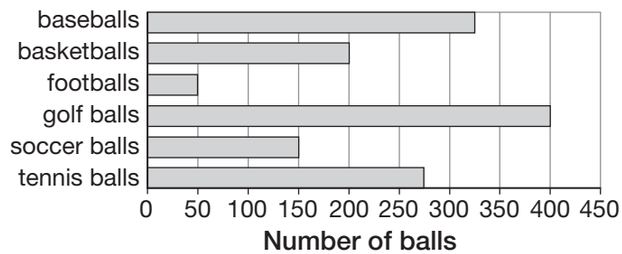
b) In which week were the fewest boxes collected? 4

c) How many more boxes were collected in week 2 than in week 4? 30

d) How many boxes were collected altogether? 75

2. Use the bar graph to answer the questions.

Types of Balls Sold in a Year by a Sports Store



a) Which type of ball was the best seller? golf

b) What is the range of these data? 350

c) How many tennis balls were sold? 275

d) How many balls were sold altogether? 1400

3. Lily says that this circle graph shows that 11 students in a class wear glasses and 21 do not. Do you agree?

Explain your thinking. No, the 2 sections of the circle are equal. 11 students and 21 students would not be shown as equal sections.

CHAPTER 3

6 Graphing with Technology

Goal **Use spreadsheet software to organize and display data.**

If you have spreadsheet software at home, answer Question 1 to show what you learned about graphing today.

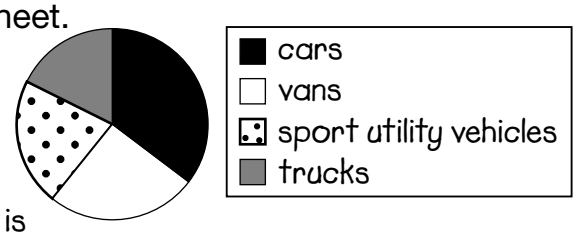
At-Home Help

Spreadsheet software allows you to change data and quickly see the effect on the graph.

1. Students counted the vehicles passing through an intersection for 5 minutes. The data that they collected were entered into a spreadsheet.

a) Enter these data into a spreadsheet.
(See spreadsheet in Question 2.)

b) Make a circle or pie graph of the data.



c) Why is a legend important? The legend is needed to tell which section of the circle shows which type of vehicle.

d) Change the number of cars to 40. What happens to the graph?

The cars section becomes much bigger and the other 3 sections become smaller.

If you don't have spreadsheet software at home, answer Question 2 to show what you learned about graphing today.

2. Students counted the vehicles passing through an intersection for 5 minutes. The data that they collected were entered into a spreadsheet.

	A	B
1	cars	18
2	vans	13
3	sport utility vehicles	11
4	trucks	9

a) If these data were displayed in a circle graph, which section would be the largest? cars

Which section would be the smallest? trucks

b) Recall the graphs you made in class. Why is a legend important?

The legend is needed to tell which section of the circle shows which type of vehicle.

c) Recall the graphs you made in class. What would happen to the graph if the number of cars changed to 40?

The cars section becomes much bigger and the other 3 sections become smaller.

CHAPTER 3

7 Communicate About Collecting Data

Goal **Describe the steps for collecting data in a clear and organized way.**

1. Pedro wanted to know what the students in his class want to be when they grow up. Label the steps from 1 to 5 in the order that he did them.

At-Home Help

Communication Checklist

- ☑ Did you show all the steps?
- ☑ Did you put the steps in order?
- ☑ Did you include only necessary information?

5 He made a bar graph of his information.	4 He organized the data he collected in a chart.	
3 He collected the answered survey questions.	1 He made up a survey question.	2 He gave each student in his class the survey question and asked them to answer it.

2. Sharleen wanted to know how students travel to school. Label the steps from 1 to 8 in the order that she did them.

7 She entered the data into spreadsheet software.	2 She made up a survey question listing the different ways she observed.	3 She asked the teacher if she could write the question on the board and survey the class.
4 She read the question that she wrote on the board.	6 She read the question again and counted how many hands were raised for each way.	1 She observed students arriving at school to see how they get there.
8 She graphed these data using the spreadsheet software	5 She told the class that she would read the question again, and asked them to raise their hands when she named the way that they usually come to school.	

CHAPTER 3

8 Conducting a Survey

Goal **Conduct a survey and make a graph to display the data.**

1. Choose a topic to collect data about.

- favourite TV show
- favourite flavour of ice cream
- favourite hockey team
- favourite season

Answers will vary.

2. Make up a question. It should have 4 or more choices. Decide if one choice should be "other." Write the question here and write the choices in the 1st column of the chart below.

Answers will vary. For example: What is your favourite flavour of ice cream?

At-Home Help

The data from Question 1 can be graphed using any of the types of graphs that you have learned about. After you make your graph, think about why you chose that type of graph.

3. Ask your question to as many people as you can. Ask everyone at home and maybe call some people. Use this chart to organize the results.

Answer chosen	Number of people
vanilla	Answers will vary.
chocolate	
butter pecan	
strawberry	
other	

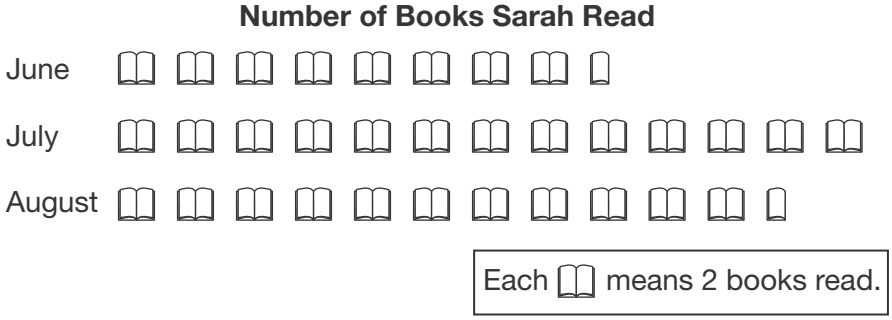
4. Make a graph of your findings. Use the grid below or spreadsheet software.

Answers will vary.

Test Yourself Page 1

Circle the correct answer.

Use this pictograph to answer Questions 1 to 3.



1. How many books did Sarah read in July?

A. 13 **B.** $8\frac{1}{2}$ **C.** 26 **D.** $11\frac{1}{2}$

2. Sarah wants to add September's reading to her pictograph. She will use $9\frac{1}{2}$ 📖. How many books did she read in September?

E. $9\frac{1}{2}$ **F.** 19 **G.** 18 **H.** 20

3. Suppose that the legend or scale was changed to "Each 📖 means 4 books." How would 1 book read be shown?

A. 📖 **B.** 📖 📖 📖 📖 **C.** 📖 **D.** ∩

Use these data to answer Questions 4 and 5.

17	18	20	20	23
25	26	29	33	34
34	37	39	40	40

4. What is the range of these data?

E. 23 **F.** 15 **G.** 40 **H.** 17

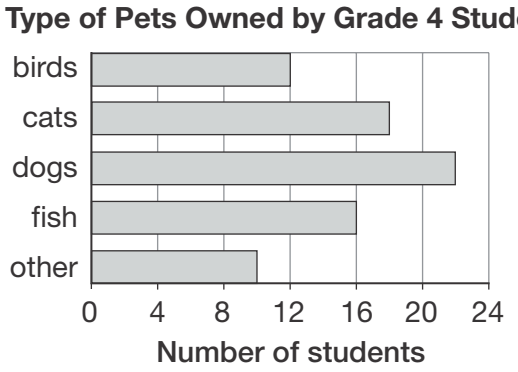
5. How many pieces of data are in the interval 25–34?

A. 3 **B.** 4 **C.** 5 **D.** 6

Test Yourself Page 2

Circle the correct answer.

Use this bar graph to answer Questions 6 to 9.



6. Which type of pet is most common?

E. birds **F.** cats **G.** dogs **H.** fish

7. How many students have fish as pets?

A. 4 **B.** 16 **C.** 20 **D.** 15

8. How many more students have dogs than cats?

E. 1 **F.** 2 **G.** 3 **H.** 4

9. If the scale were 2 at the first grid line, instead of 4, which statement would be true?

A. The last grid line would be 48 instead of 24.

B. The graph would have to be longer to show the same data.

C. The graph could be shorter to show the same data.

D. The last grid line would be 20 instead of 24.

10. The number of people in this interval is 70. What is the scale?

E. 20, 40, 60, 80

F. 15, 30, 45, 60

G. 10, 20, 30, 40

H. 1, 2, 3, 4