3.3 Display Data

Student Text Pages
118–129

Suggested Timing
80–160 min

Tools
- calculators
- protractors
- compasses
- grid paper
- coloured pencils or markers
- rulers
- computers
- Microsoft® *Excel*
- graphing calculators
- *Fathom*™

Related Resources
BLM 3-7 Section 3.3 Display Data
BLM 3-8 Section 3.3 Achievement Check Rubric
BLM G-1 Grid Paper
BLM T-1 *Microsoft® Excel*
BLM T-4 *Fathom*™

Link to Prerequisite Skills

Students should complete questions 4 to 7 in the Prerequisite Skills prior to starting this section.

Warm-Up

1. Give an example of data that could be displayed using a
a) bar graph **b)** circle graph **c)** line graph
2. Give an example of data that could be displayed using either a bar graph or a circle graph.

Warm-Up Answers

1. a) Favourite sport to watch by your classmates.
b) Weekly family budget.
c) Outdoor temperature over time.
2. Salaries of a professional hockey team based on position.

Teaching Suggestions

Warm-Up

- Write the Warm-Up questions on the board or on an overhead. Have students complete the questions independently. Then, discuss the solutions as a class.

Section Opener

- Students may have heard the expression "a picture is worth a thousand words", but few may know what it means. Ask students to study the photograph and describe what they see. Record their descriptions, and the meaning of the phrase will become evident.

Investigate

- In Investigate 1, students can complete Method 1 with little guidance as they have seen these types of graphs before. Supply students with **BLM G-1 Grid Paper**. Have students work in pairs, then have one student from each pair share their answers.
- Use Method 2 if spreadsheet software is available. Work through Method 2 yourself before assigning it to students to be sure that you understand each step.
- When taking up **question 4**, record the different examples and have students copy these lists into their notes.
- For Investigate 2, students have also worked with the histograms before. Have students work with a partner. Circulate as students work to be sure they understand the material. Use Method 3 if *Fathom*™ is available.
- **BLM T-1 *Microsoft® Excel*** and **BLM T-4 *Fathom*™** explain the basics of these tools and will be helpful if students are using them for the first time.

Investigate Answers (pages 118–122)

Investigate 1
Method 1

Graphs may vary.

1. See graph on page 119.

2.

Expense	Amount ($)	Percent (%)	Measure of Angle (°)
entertainment	100	14.7	52.9
clothing	225	**33.1**	**119.2**
cell phone	50	**7.4**	**26.7**
lunch	75	**11.3**	**40.7**
transportation	80	**11.8**	**42.5**
rent	150	**22.1**	**79.6**
TOTAL	680	**100**	**360**

See graph on page 120.

3. The circle graph best displays Jong's expenses, since it shows the percent or fraction that each expense is of her total expenses.

4. A bar graph is used for categorical data, such as the number of students in a class and their favourite sports. A circle graph is used to compare parts to the whole, such as what percent of a company's budget is spent on each type of expense.

Method 2

3 Advantages: using a spreadsheet is faster than graphing by hand and makes a neater graph. Disadvantages: learning how to use the software might take time.

Investigate 2
Method 1

1.

Interval	Tally	Frequency
[130–140)	||||	4
[140–150)	||	**2**
[150–160)	|||||||	7
[160–170)	|||||	**5**
[170–180)	|||||||	**7**
[180–190)	|||	**3**
[190–200)	||	**2**

Graphs may vary. See graphs on page 122.

Examples

- Read through the Examples, paying careful attention to the difference between continuous and discrete data.

Key Concepts

- Read the Key Concepts with the students.

Discuss the Concepts

- Have students work in pairs. They can refer to the Examples for help.
- For question D2, some students may think that numerical data is always continuous and categorical data is always discrete. Use their answers to create a list of examples for each type of data to show this is not true.

Discuss the Concepts Suggested Answers (page 125)

D1. A histogram is used to display continuous data, such as the heights of basketball players. A bar graph is used to display discrete data, such as the favourite basketball teams of a group of students.

D2. a) Yes, but only if the set of data is distinct and can be counted.

b) Yes, since continuous data can have any numerical value.

Practise (A)

- Encourage students to refer to the Investigates and the Examples before asking for assistance.
- Have students work in pairs. Take up this work before students move to the Apply questions.

Apply (B)

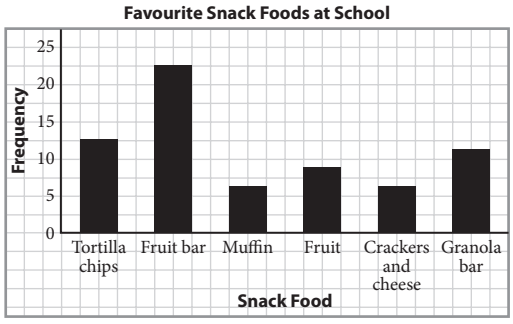
- In **question 5**, students should note that for test scores out of 100, the last interval includes 100 and therefore, the closing parenthesis is a square bracket.
- For **question 7**, students might try to solve the problem of students reporting their heights inaccurately rather than focussing on the question. Remind them the question is whether a histogram or a bar graph would be best to display the data (i.e. if the data continuous or discrete).
- **Question 10** is a Literacy Connect. Have magazines and newspapers on hand or assign the question for homework and collect the responses the next day.
- **Question 11** links to the Chapter Problem. If students suggest different types of graphs for the same collected data, have students discuss the merits of each type. Remind students to keep the solution to this question handy as the methods they used may help them with the Chapter Problem Wrap-Up.
- **Question 12** is an Achievement Check question. You may wish to use **BLM 3-8 Section 3.3 Achievement Check Rubric** to assist you in assessing your students.

Extend (C)

- Assign the Extend questions to students who are not being challenged by the questions in Apply. Use these questions as assignments, or have students work in small groups and present their work to the class.

Achievement Check Answers (page 128)

12. Answers may vary. Sample answer:



I chose a bar graph because the data is categorical. A bar graph shows the frequency of each response.

Common Errors

- Some students have trouble distinguishing histograms and bar graphs.

R_x Have students review the concepts of discrete and continuous data in order to make the correct choice of graph.

Accommodations

Memory—continue to develop the word wall

Visual—provide a circle protractor to assist with the construction of the circle graph

Spatial—provide more scaffolding, including numbered steps, for instructions for creating graphs in Microsoft® *Excel*

Perceptual—provide large sheets of graph paper for construction of bar graphs and histograms

Mathematical Process Expectations

Process Expectation	Questions
Problem Solving	3, 14
Reasoning and Proving	1–4, 7, 9–11, 13, 14
Reflecting	3, 7, 9–11, 13, 14
Selecting Tools and Computational Strategies	5
Connecting	9, 10
Representing	5, 6, 8, 9, 12, 13, 14
Communicating	2, 3, 4, 7, 9–11, 14

Extra Practice

- You may wish to use **BLM 3-7 Section 3.3 Display Data** for remediation or extra practice.