

3.2

Student Text Pages

152–159

Suggested Timing

80–160 min

Related Resources

BLM 3-4 Section 3.2 Effective Surveys

BLM 3-5 Section 3.2 Achievement Check Rubric

Effective Surveys

Link to Prerequisite Skills

Students should complete Statistics Terminology in the Prerequisite Skills before proceeding with this section.

Warm-Up

Work in groups.

1. Make a three-question survey to find out your classmates' musical preferences.
2. Read some of the survey questions out loud as a class. Do you think the participants can answer the questions honestly, without having any influence on their answers? Discuss as a class.
3. Do any questions contain bias? If yes, how could these questions be rewritten so they are not biased?

Warm-Up Answers

Answers may vary.

Teaching Suggestions

- Students have had little exposure to critical analysis of surveys, particularly their own surveys. Having students critically analyse their classmates' surveys can help them improve their own surveys.
- Have students collect examples of poorly designed surveys from local newspapers or the Internet. Students could revise or analyse the surveys as a class project.

Warm-Up

- Display the Warm-Up questions. Have students work in groups to complete question 1. Then, discuss questions 2 and 3 as a class.

Section Opener

- Introduce this section by asking students how important it is to have accurate surveys and accurate results. Discuss how this is important to governments, businesses, and social service providers, such as hospitals and social workers.

Investigate

- Have students work in small groups. Include a class discussion on why each tip is important when conducting a survey.
- Follow up by going over the Principles of Proper Surveying on page 153. Have a discussion on the overlap between this list and the ten tips in the Investigate.

Investigate Answers (page 152)

Answers may vary. For example:

1. A statement of purpose provides a goal for the survey. Implement it by clearly defining the questions that should be answered by the survey.
2. Instructions help the respondents correctly answer the survey. Implement it by clearly stating the instructions ahead of each question in the survey.
3. Questions that are short and clear help the respondents to answer the questions honestly and quickly without feeling burdened. Implement it by using short, common words. Do not have a lot of unnecessary information in the question.
4. Questions that are easy to answer help the respondents to quickly answer the questions honestly. Implement it by using multiple choice questions, true/false questions, or check boxes.
5. Bias-free questions ensure accurate survey responses. Implement it by providing all possible answers to multiple-choice questions. Do not state any opinions in the survey questions.
6. Covering the entire range of answers helps to avoid introducing the bias of not providing a possible answer. Keeping the list short helps the respondents to quickly scan the list to find their answer. Implement it by covering the entire range of answers but keeping the list short.
7. A questionnaire that flows helps the respondents by continuing along similar lines of thought so that they do not need to recall the same information at several points throughout the survey. Implement it by asking all questions on a particular topic together in one section of the survey.
8. Using plain English ensures that all the respondents will clearly understand the questions and be able to answer honestly and accurately. Implement it by avoiding technical language or by defining any terms that might not be generally known.
9. Not asking for personal information helps the respondents to feel their responses are anonymous, so they will be more willing to provide honest answers to all questions. Implement it by avoiding questions that are not essential to the survey or by using ranges or groups of potential responses if necessary.
10. Testing the survey ensures that it is effective, achieves its purpose, and collects all the required data. Implement it by testing the survey on a small group of people and analysing the results.

Examples

- Extend Example 1 by asking students to write their own examples of survey questions that break the principles of proper surveying.
- For Example 2, discuss as a class which type of question would be best used in certain situations. Provide additional situations and ask students to identify the type of question they think is most appropriate.
- For Example 3, students give one advantage of each mode of delivery. Students are asked to give one disadvantage in **question 3** of the Practise questions.

Key Concepts

- Review the Key Concepts as a class.

Discuss the Concepts

- Have students work in pairs to answer these questions, and then discuss as a class. Have students consider how they would conduct or answer a survey.

Discuss the Concepts Suggested Answers (page 156)

D1. Personal interview: respondents may clarify their answers, and interviewers can explain any unclear questions.

Internet: many people can be contacted in a short time.

Telephone: respondents can be contacted multiple times to complete a survey if they are interrupted or were not available the first time.

Mail: there is no additional cost of providing interviewers for the survey.

D2. Have clear instructions for answering the survey. Have a simple survey design without a lot of complicated flow patterns based on previous responses. Provide multiple-choice questions with ranges of values. Ask the same question in a different way to ensure consistency of responses.

Practise (A)

- You may wish to have students work in pairs or small groups to complete the Practise questions.
- Encourage students to refer to the Examples before asking for assistance.

Apply (B)

- In **question 5**, students should include factors such as income, number and age of children in the household, number of parents or caregivers in the household, and type of accommodations.
- In **questions 8 and 10**, have students write their answers on the board. Discuss as a class what is right about each survey and what could be improved. This can also be done by having students trade answers with a classmate.
- **Question 13** is an Achievement Check question. You may wish to use **BLM 3-5 Section 3.2 Achievement Check Rubric** to assist you in assessing your students' responses.

Extend (C)

- Assign the Extend questions to students who are not being challenged by the Apply questions.

Achievement Check Answers (page 159)

Answers may vary. For example:

13. Answers may vary. For example:

Add an introduction to explain the purpose of the survey.

In question 3, add the option "I do not like peaches."

In question 4, change the rating scale to: "Not applicable – 1, Not much – 2, Somewhat – 3, Pretty good – 4, Fantastic – 5."

Change question 5 to an open-ended question rather than a multiple-choice question.

Change the order of the questions to put question 5 about the favourite fruit in the position of question 2, so that the survey about peaches does not influence respondents to answer that peaches are their favourite fruit.

Common Errors

- Some students may not understand the meaning of *bias*, and may think it means the surveyor is biased against someone.

R_x Have students consider how their answers to a survey question can be influenced by the words in the survey. Have them read **question 11** to show that bias means an undue influence rather than a personal dislike of something or someone.

Accommodations

Visual—post the Principles of Proper Surveying around the room

ESL— provide a partner to assist students with reading and understanding this section, especially with understanding the Principles of Proper Surveying. Ask them to add the definitions of new terms in this section to their personal math dictionaries: *bias, survey, ethics, confidentiality, sample, dichotomous, and bi-weekly*.

Perceptual—have students search magazines, newspapers, and the Internet for examples of the types of questions that can be used in a survey. Organize the examples by type on large poster paper.

Language—add a definition of bias to the Word Wall

Gifted and Enrichment—have students search magazines, newspapers, and the Internet for sample surveys. Have them check if the surveys follow the principles of proper surveying and share their results with the class.

Literacy Connect

- Have one or two students read the section opener and the Investigate instructions out loud. Ensure students understand what is expected of them in the Investigate.
- Have a few students read the Principles of Proper Surveying on page 153 out loud. You may wish to discuss these principles as a class to ensure all students understand the words used.
- Encourage students to add new definitions for this section to their personal math dictionaries: *bias, survey, ethics, confidentiality, sample, dichotomous, and bi-weekly*
- Discuss the meaning of *bi-weekly* as related to **question 9** in the **Literacy Connect** on page 158.

Mathematical Process Expectations

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

Ongoing Assessment

- You can use the Achievement Check question and its rubric as formative assessment tools. Most of the Discuss the Concepts questions can be used as short quizzes to determine if students have understood the Investigate and Examples.

Extra Practice

- Use **BLM 3-4 Section 3.2 Effective Surveys** for extra practice or remediation.