2.4 Interpret Information Involving Probability

Student Text Pages
86–93

Suggested Timing
70 min

Tools
- graphing calculator
- grid paper

Optional:
- spreadsheet software
- random number generator
- spinners

Related Resources
BLM 2-7 Section 2.4 Interpret Information Involving Probability
BLM 2-8 Section 2.4 Achievement Check Rubric
BLM G-1 Grid Paper
BLM 2-9 Chapters 2 and 3 Literacy Connect

Link to Prerequisite Skills

Students should complete all the questions in the Prerequisite Skills before proceeding with this section.

Warm-Up

1. Evaluate.
a) 0.90×30 **b)** $\frac{3}{10} \times 40$

2. Of 40 people surveyed, 24 are Leafs fans and 16 are Senators fans.
a) What percent are Leafs fans? **b)** What fraction are Senators fans?

Warm-Up Answers

1. a) 27 **b)** 12

2. a) 60% **b)** $\frac{2}{5}$

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

- Ask students to bring a newspaper and look for examples of statistics. Discuss how statistics are typically presented in the newspaper. Why is this the case? Discuss how statistics are used in sports, politics, medicine, and the music industry. Ask students if they can think of ways statistics can be used to mislead the public.

Investigate

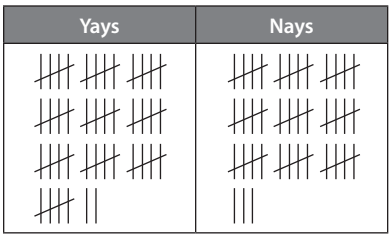
- Investigate 1: Many scientific calculators have a random number generator, which will produce results similar to the **rand** command.
- As an alternate activity, use a random number function in a spreadsheet. There are a variety of ways of finding the results. Then use the software to create the bar graph.
- In Investigate 2, point out that statistics, like theoretical probability, provide only an estimate of what might occur, but may differ from what actually happens.

Investigate Answers (pages 86-88)

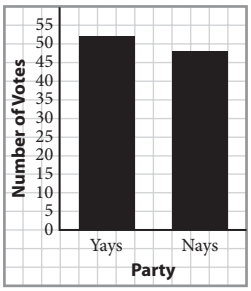
Investigate 1

5. There is a 55% chance a person will vote Yay and also a 55% chance the **rand** command will produce a number less than 0.55, so a number less than 0.55 simulates a vote for Yay. Similarly, there is a 45% chance that a person will vote Nay and a 45% chance the **rand** command will produce a number greater than 0.55.

6. to 8. Answers may vary. Sample answer:



9.



10. The results were similar. There were more Nays than I expected.

11. Yes. The Nays were only 4 votes less than the Yays, not 10 less as they are in the theoretical probability. They could win in an experiment because experimental probability does not always match theoretical probability.

12. Answers may vary.

Investigate 2

2., 3. Answers may vary.

4. This is not a realistic situation. Saying the Leafs will allow 2 goals per game and that they will take 25 shots at Brodeur, are both large assumptions. Other factors such as injuries, momentum, and a different style of play in playoffs would also affect the results.

5. A *save percentage* is not expressed as a percent, but as a decimal with 3 digits.

Example

- In part c), ask students how they could conduct the survey differently to obtain more reliable results. (Involve more high schools, ensure students from different grades are polled, ask an equal number of males and females, not conduct the survey after a school dance or a concert, etc.)
- As an alternative, have students conduct their own survey with exactly the same question, but allow them to choose who will complete the survey. Compare results, then ask students to suggest why the results are not the same as the Example.

Key Concepts

- How are statistics collected? Ask students to brainstorm, and then make a list.
- Remind students that, like probability, statistical predictions may differ from actual events.

Discuss the Concepts

- Give students time to formulate their answers before discussing the questions as a class.

Discuss the Concepts Suggested Answers (page 89)

D1. Similar: they can both be used to predict future events. Different: statistics make predictions based on actual past events or surveys; experimental probability usually involves simulating a real-life situation.

D2. You must consider who collected the data and why. For example, if a toothpaste company claims dentists recommend their brand, it is possible that company was involved in conducting the survey to make its product look good.

D3. Deciding what music to buy; following sports teams; comparing products for quality, price, best performance, etc.

Practise (A)

- Encourage students to refer to the Investigates and the Example before asking for assistance.

Apply (B)

- For **question 5**, a 0.300 batting average means the player averages 300 hits in every 1000 at bats, or 3 hits per 10 at bats.
- **Question 7** shows how choosing the form of a statistic (number of women rather than percent of women) can affect how the statistic appears to readers. Students could find other examples like this in the media.
- For **question 8**, students could find the country with the largest number of immigrants compared to its population. **Part c)** touches on conditional probability.
- **Question 9** is an Achievement Check question. You may wish to use **BLM 2-8 Section 2.4 Achievement Check Rubric** to assist you in assessing your students. Question 9 is also a Literacy Connect. You may wish to assign this question as a journal entry or to discuss the question as a class.

Extend (C)

- Assign the Extend questions to students who are not being challenged by the questions in Apply.
- For **Question 11**, students should use the complement: 30% P.O.P means 70% chance of no rain.

Achievement Check Answers (page 93)

9. a) about four students

b) The ratio likely comes from a pattern the researcher found after studying a large number of students.

c) Answers may vary.

Common Errors

- Some students may have difficulty when there are two subsequent events, as in question 11.

R_x Have students draw a tree diagrams for tossing 2 coins. Encourage them to recognize that each of the 4 branches will have a probability of $\frac{1}{2}$, which is $\frac{1}{4} \times \frac{1}{4}$. Through patterning, students should recognize that the probability of both events occurring is the product of the each of the two events.

Accommodations

Perceptual—provide a large version of the graph for question 8 with different coloured bars

Gifted and Enrichment—research multiple sclerosis and prepare a poster with more statistics about the disease

Language—assist or have a student assist with reading the exercises

Motor—provide a large copy of the tally chart for Investigate 1

Literacy Connect

- Supply students with B**LM 2-9 Chapters 2 and 3 Literacy Connec**t.
- Students will need the Internet addresses of two organizations that provide information about diabetes. Go to *www.mcgrawhill.ca/books/foundations11* and follow the links. Students will need the information to complete the exercise.
- This literacy activity may be assigned at any convenient time while students are working on Chapters 2 and 3.
- You might want to use **BLM A-18 Opinion Piece Checklist** to assess students responses.
- Please refer to page xv of the Overview in this Teacher's Resource for further information about these special literacy BLMs.

Mathematical Process Expectations

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

Extra Practice

- You may wish to use **BLM 2-7 Section 2.4 Interpret Information Involving Probability** for remediation or extra practice.