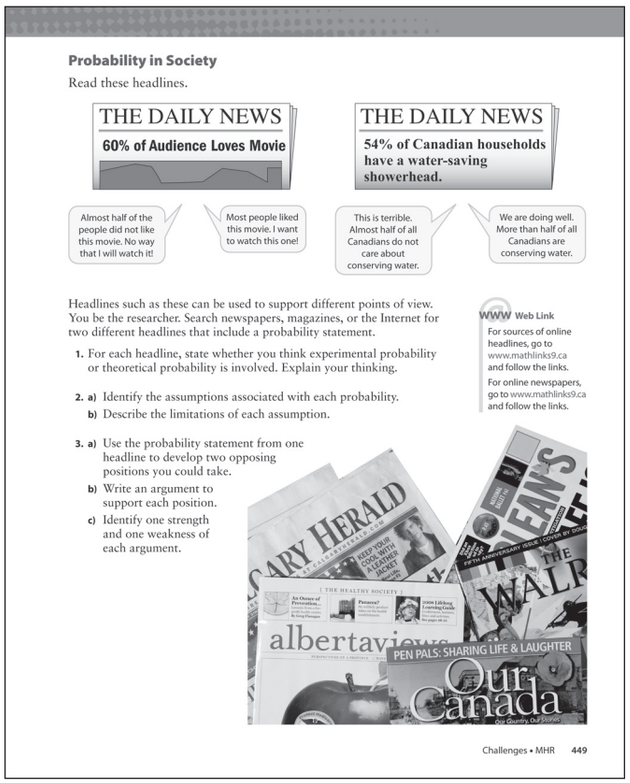

Probability in Society

Read these headlines.

THE DAILY NEWS
60% of Audience Loves Movie

Almost half of the people did not like this movie. No way that I will watch it!

Most people liked this movie. I want to watch this one!

THE DAILY NEWS
54% of Canadian households have a water-saving showerhead.

This is terrible. Almost half of all Canadians do not care about conserving water.

We are doing well. More than half of all Canadians are conserving water.

Headlines such as these can be used to support different points of view. You be the researcher. Search newspapers, magazines, or the Internet for two different headlines that include a probability statement.

1. For each headline, state whether you think experimental probability or theoretical probability is involved. Explain your thinking.

2. a) Identify the assumptions associated with each probability.
   b) Describe the limitations of each assumption.

3. a) Use the probability statement from one headline to develop two opposing positions you could take.
   b) Write an argument to support each position.
   c) Identify one strength and one weakness of each argument.

WWW Web Link
For sources of online headlines, go to www.mathlinks9.ca and follow the links.
For online newspapers, go to www.mathlinks9.ca and follow the links.

albertaviews
PEN PALS: SHARING LIFE & LAUGHTER
Our Canada

Challenges • MHR 449

Planning Notes: Probability in Society

You may wish to use the following steps to introduce and complete this Challenge:

1. As a class, have students brainstorm terms associated with probability. You might record the words in columns ranging from impossible (0%) to certain (100%). (Examples include impossible, sure thing, unlikely, looking good, no worries, 50–50 chance, doubtful, sure bet, ghost of a chance, odds, odds-on favourite, at risk, and unchanged.)
2. Discuss the kinds of headlines that might use probability (e.g., weather, science, health and medicine, sports, advertising, accidents, crime, politics). Depending on the class, you may wish to discuss examples such as those on **BLM 11–17 Newspaper Headlines**. If so, have students identify the probability terms and explain how each headline could be used to support different points of view.
3. As a class, read the Challenge. In addition to the headlines, explain what source information you expect students to record (e.g., author or source, page reference or URL if applicable, date).

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Suggested Timing
60–80 minutes

Materials
- magazines or newspapers
- computer with Internet access (optional)

Blackline Masters
Master 1 Project Rubric
BLM 11–17 Newspaper Headlines

Mathematical Processes
- ☑ Communication (C)
- ☑ Connections (CN)
- ☐ Mental Mathematics and Estimation (ME)
- ☑ Problem Solving (PS)
- ☑ Reasoning (R)
- ☑ Technology (T)
- ☑ Visualization (V)

Specific Outcomes
SP1 Describe the effect of:
- bias
- use of language
- ethics
- cost
- time and timing
- privacy
- cultural sensitivity on the collection of data.

SP2 Select and defend the choice of using either a population or a sample of a population to answer a question.
SP3 Develop and implement a project plan for the collection, display and analysis of data by:
- formulating a question for investigation
- choosing a data collection method that includes social considerations
- selecting a population or a sample
- collecting the data
- displaying the collected data in an appropriate manner
- drawing conclusions to answer the question.

SP4 Demonstrate an understanding of the role of probability in society.

4. Clarify that the task is to
   - find and describe two headlines where probability is used
   - identify the type(s) of probability involved
   - identify assumptions
   - describe limitations
   - develop two opposing positions for interpreting one headline
   - identify a strength and a weakness of each argument
5. Review the **Master 1 Project Rubric** with students so that they will know what is expected.

Meeting Student Needs

- Some students may need help with the assignment. Provide them with **BLM 11–17 Newspaper Headlines**. Walk through the first headline together, and then have students complete additional headlines on their own. At this point, they may be ready to research their own headlines.
- Students may need help to identify terms that are usually associated with probability and are used in another context.
- Some students may need help to do a web search.
  - Help students choose appropriate search terms such as those they brainstormed as a class.
  - Students who have difficulty finding appropriate headlines could focus their search on events that are certain or impossible. They could key *certain* or *impossible* plus a search topic such as sports.
- To reduce the time needed to complete this Challenge, provide students with a list of news headlines that include probability.

Gifted and Enrichment

- Challenge students to develop a set of guidelines for how to look at data with a more critical attitude. They may find the related Web Link on this TR page helpful.

Web Link

For information about how to look at data with a more critical attitude, go to www.mathlinks9.ca and follow the links.

This Challenge can be used for either Assessment *for* Learning or Assessment *of* Learning.

Assessment	Supporting Learning
Assessment *for* Learning	
Probability in Society Discuss the Challenge as a class. Have students provide individual responses.	• Consider allowing students to work with a partner and then write individual responses.
Assessment *of* Learning	
Probability in Society Introduce the Challenge to the class. Have students provide individual responses.	• **Master 1 Project Rubric** provides a holistic descriptor that will assist you in assessing student work on this Challenge. Page 606 provides notes on how to use this rubric for the Challenge. • To view student exemplars, go to www.mathlinks9.ca, access the Teacher Centre on the Online Learning Centre, go to Assessment, and then follow the links.

The chart below shows the **Master 1 Project Rubric** for tasks such as this Challenge, Probability in Society, and provides notes that specify how to identify the level of specific answers for this project.

Score/Level	Holistic Descriptor	Specific Question Notes
5 **(Standard of Excellence)**	❑ Applies/develops **thorough** strategies and mathematical processes making **significant** comparisons/connections that demonstrate a **comprehensive** understanding of how to develop a complete solution ❑ Procedures are **efficient and effective** and may contain a **minor mathematical error** that does not affect understanding ❑ Uses **significant** mathematical language to explain their understanding and provides **in-depth** support for their conclusion	• provides a correct and complete solution
4 **(Above Acceptable)**	❑ Applies/develops **thorough** strategies and mathematical processes for making **reasonable** comparisons/connections that demonstrate a **clear** understanding ❑ Procedures are **reasonable** and may contain a **minor mathematical error** that may hinder the understanding in one part of a complete solution ❑ Uses **appropriate** mathematical language to explain their understanding and provides **clear** support for their conclusion	Demonstrates one of the following: • provides a complete response with weak communication • provides a complete and correct response for one headline only • provides a complete response with one error or omission in the assumptions, limitations, or interpretation
3 **(Meets Acceptable)**	❑ Applies/develops **relevant** strategies and mathematical processes making **some** comparisons/connections that demonstrate a **basic** understanding ❑ Procedures are **basic** and may contain a **major error or omission** ❑ Uses **common** language to explain their understanding and provides **minimal** support for their conclusion	Demonstrates one of the following: • provides a correct and complete response to #1 and 2, and a significant start to #3 • provides partially correct solutions to all parts of the question that demonstrate a basic understanding of the problem but the communication may be weak • provides a complete and correct response to #3
2 **(Below Acceptable)**	❑ Applies/develops **some relevant** mathematical processes making **minimal** comparisons/connections that lead to a **partial solution** ❑ Procedures are **basic** and may contain **several major mathematical errors** ❑ Communication is **weak**	Demonstrates one of the following: • provides a correct and complete #1 and a significant start to #2; may identify assumptions and limitations for only one headline, or may have one incorrect assumption, or may have omitted limitations
1 **(Beginning)**	❑ Applies/develops an **initial start** that may be **partially correct** or could have led to a correct solution ❑ Communication is **weak or absent**	Demonstrates one of the following: • provides a correct initial start to any part of the question • correctly completes #1 for one headline

For student exemplars, go to www.mathlinks9.ca and follow the links.