

MAY 30, 2017

**UNIT 9: PROBABILITY AND
STATISTICS**

**9.2: POTENTIAL
PROBLEMS WITH
COLLECTING DATA**

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MATH 9



WHAT'S THE POINT OF TODAY'S LESSON?

We will begin working on the Math 9 Specific Curriculum Outcome (SCO) "Statistics and Probability 1" OR "SP1" which states:

"Describe the effect of: bias
use of language
ethics
cost
time / timing
privacy
cultural sensitivity
on the collection of data."

HOMWORK QUESTIONS?

(pages 427 / 428 / 429, #3, 4, 5, 6, 8, 9, 10 & 17)

10. 1 in 7000 not the suspect

Prosecution
6999

99.9%

chance that
he did it!

Defense

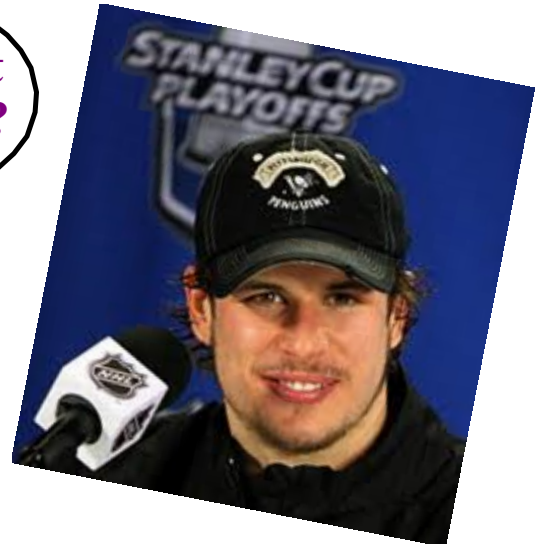
1/7000

0.01%

"A shadow of
a doubt."

Potential Problems with Collecting Data

Sidney! Who has the best hockey team in the NHL?



What may influence his response????

Factors that MIGHT lead to Problems with Data Collection

Bias

When the question influences responses in favour of or against the topic of the data collection.



Example: "Don't you think teachers give too much homework?"

The student is biased due to the **CURRENT** amount of homework being assigned by **HIS** teachers.

Use of Language

The language used to ask a question could lead people to give a particular answer.

EXAMPLE: Don't you think the price of a movie ticket is too high?
(This question may LEAD people to say, "YES".)

"DO YOU THINK" is a better way to start a question.



Timing

WHEN data is actually collected could lead to particular results.



EXAMPLE: What is your favorite sport?

WINTER SURVEY:
Response - "Hockey"



SUMMER SURVEY:
Response - "Baseball"



Privacy

If the topic of the data collection is personal, a person may not want to participate or may give an untrue answer. Anonymity may help.

EXAMPLE: "Mr. Jones, have you ever experimented with drugs?"



Cultural Sensitivity

You must be aware of other cultures and avoid being offensive by asking questions that do not apply to the people being surveyed.

EXAMPLE: Which holiday is your favorite?

Circle one of the following:

CHRISTMAS


EASTER

(This question does not apply to all cultures.)




Ethics

Data must only be used for the purpose told to the participants; otherwise, your actions are considered unethical.



Hi, Mrs. Smith. My name is Sam White, and I am collecting data for the Federal Government of Canada. Who will you be supporting in the next election?



Hello, Mr. White. May I ask, who wants to know this and why?

Cost

The cost of collecting data must be taken into account.

- making/printing/ mailing questionnaires
- collecting data (people/gas)

(It may be more than you can afford.)



Time

The time needed for collecting the data must be considered.



EXAMPLE: A survey that takes an hour to complete may be too long for most people. This would limit the number of people willing to participate.

Identifying and Eliminating Potential Problems

EXAMPLE: Explain why a problem may occur with the following survey question and the effect it could have on the results. Suggest how this could be avoided.

A survey is conducted to find out if citizens think the local government should provide more money for youth activities. The question asked was "Would you support an increase in taxes to create more skateparks?"



POTENTIAL PROBLEM: The LANGUAGE used could be problematic. The question emphasizes what citizens would lose (\$); that is, their taxes would increase. It downplays what citizens could gain by only mentioning skate parks instead of a variety of youth activities.

EFFECT: Citizens' responses could be swayed toward NO.

SUGGESTED REPLACEMENT QUESTION: "Do you think the local government should supply more funds for youth recreational activities?"

Analyzing Data Collection for Problems

EXAMPLE:

Kan and Ike would like to open a shop in Saskatoon that would sell traditional Inuit crafts. To ensure Saskatoon is the best place for their business, they want to survey residents to find out how popular Inuit crafts are in that area.

Kan knows they would get the most accurate results if each household in Saskatoon was surveyed, but Ike points out that this problematic. Explain why.



POSSIBLE ANSWER:

COST and TIME may be problems.

The cost of printing and mailing enough surveys for each household would be very high. Also, they would have to provide a postage paid return envelope for each household.

The time it would take to print, mail and collect the survey for each household would likely take too long.

Overcoming Potential Problems

EXAMPLE:

Antonio wants to conduct a survey to find out if there is a relationship between household income and how much people spent on Christmas presents. Identify potential problems Antonio may encounter, and explain how he could deal with the problems.



POSSIBLE ANSWER:

POTENTIAL PROBLEM #1 (CULTURAL SENSITIVITY):

Christmas is not celebrated by all cultures; therefore, the survey may not apply to all.

An appropriate opening question might be: "Do you celebrate Christmas?" If the response is "NO", then the respondent will not need to answer the rest of the survey.

POTENTIAL PROBLEM #2 (PRIVACY):

Income information is personal, so people may be uncomfortable revealing their true answer. An anonymous survey may be appropriate.

POTENTIAL PROBLEM #3 (LANGUAGE):

The use of language may influence responses. Inappropriate or intrusive questions would be:

"How much do you make?"

"How much do you spend on Christmas gifts?"

A more appropriate question might be:

"Is the amount you spend on Christmas presents greater than, less than or equal to your weekly income?"

POTENTIAL PROBLEM #4 (TIMING):

Depending on the time of year Antonio conducts his survey, the data may be accurate or inaccurate. For example, people surveyed in January would likely know how much they spent on Christmas presents, but they may forget by June. He would likely get better data by doing his survey in January.

CONCEPT REINFORCEMENT:

MMS9:

PAGE 435: #3 & #5 TO #8

PAGE 436: #9, #10 & #13