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MAP 4C – Unit 1: Working with Data

Date: _____.

Lesson 2: Assessing the Entire Survey Process

Use the following words to fill in the blanks: *random, representative, influence, small, total, choices, chance, big, group, reliable*

Population: the total number of individuals or subjects from which data is gathered/collected

Sample: a group chosen from the population whose answers represents that of the population. The sample should be representative, it needs to be typical of the entire population. If it is not representative of the population then it is biased and the survey results are invalid.

Things to consider when conducting a survey:

1. Is the sample size appropriate? If the sample is too small, the survey results may not be reliable. If the sample size is too big, the survey may be too costly and difficult to administer.
2. Are the questions unbiased? Biased restrict people's choices or use words that could influence people to answer in a certain way.
3. Is the manner in which the survey is conducted appropriate? If the questions are about sensitive subjects, people may be more likely to answer honestly if they can reply anonymously in writing rather than responding to an interview in person or over the phone?
4. Is the sampling technique appropriate? Some sampling techniques are random, which means that each member of the population has the same chance of being selected. A non random technique may not yield a representative sample. Below are some different sampling techniques.

Simple Random Sample: a sample selected by chance (with no bias), each individual has an equal chance of being selected

Ex: _____

Systematic Random Sampling: sampling in which individuals are selected at regular intervals; the starting point is randomly selected.

Ex: _____

Stratified Random Sample: sample in which the population is divided into groups that share common characteristics, called *strata*, and a random sample is taken from each group

Ex: _____

Cluster Random Sampling: sample in which the population is divided into groups, a random sample of groups is taken and all members in the selected groups are surveyed.

Ex: _____

Convenience sampling: (not random) sampling in which individuals who are easy to sample are chosen.

Ex: _____

Judgement sampling: (not random) sampling in which the person doing the sampling uses his/her judgement to create a representative sample.

Ex: _____

Voluntary sampling: (not random) sampling in which participants volunteer to be included in the sample.

Ex: _____

Destructive sampling: sampling where the chosen data is destroyed in the process.

Ex: _____

Assessing the Entire Survey Process

About 4000 people visited a large sports equipment store during its annual sale. The store surveyed 100 customers after they paid for their purchases. An employee recorded their answers.

1. Good sports equipment can greatly improve performance. How much do you spend on equipment each year?	
<input type="checkbox"/> \$200 or less	<input type="checkbox"/> \$200-\$400
<input type="checkbox"/> \$400-\$600	<input type="checkbox"/> \$600-\$800
<input type="checkbox"/> \$800-\$1000	<input type="checkbox"/> More than \$1000
2. How much do you earn per year?	
<input type="checkbox"/> Less than \$10 000	<input type="checkbox"/> \$10 000-\$20 000
<input type="checkbox"/> \$20 000-\$40 000	<input type="checkbox"/> \$40 000-\$60 000
<input type="checkbox"/> \$60 000-\$80 000	<input type="checkbox"/> More than \$80 000

Why are the survey results invalid? How could the survey be improved?

Consider:

Is the sample large enough?

Is the sample representative?

Are the survey questions unbiased?

Was the collection method appropriate?

Independent work:

1.

Many media organizations use their Web sites to pose a “question of the day.” Find a few of these informal surveys on the Internet.

For each example you find, answer these questions.

- a) What was the survey question?
- b) How many people responded? What were their opinions?
- c) Is the question related to any information presented on the Web site? If so, might the information affect how people answer? Explain your thinking.
- d) Are people able to respond to the survey more than once? How can you find out? How might this affect the results?

Do you think your safety is compromised by those who chat on cellphones while driving?

Yes **95%**
11444 votes

No **5%**
652 votes

What is your favourite genre of music?

Pop - 17%

Rock - 38%

Country - 24%

Hip-Hop - 16%

Indie - 5%

Total votes 32053

Should politicians be allowed to overrule nuclear safety experts?

Yes 592 17%

No 2781 82%

Do you think that Canada and the European Union should enter a free-trade deal?

Yes 74%

No 21%

Don't know / don't care 5%

Total votes for this question: 19

What kind of news do you most prefer to read?

International news 29%

Local news 48%

Political news 12%

Entertainment news 9%

Environmental news 2%

Total votes for this question: 2043

VOTE

Which actor would you like to co-star in a flick with?

Jim Carrey 20%

Sandra Oh 14%

Mike Myers 26%

Ellen Page 31%

975 responses, not scientifically valid, results updated every minute.

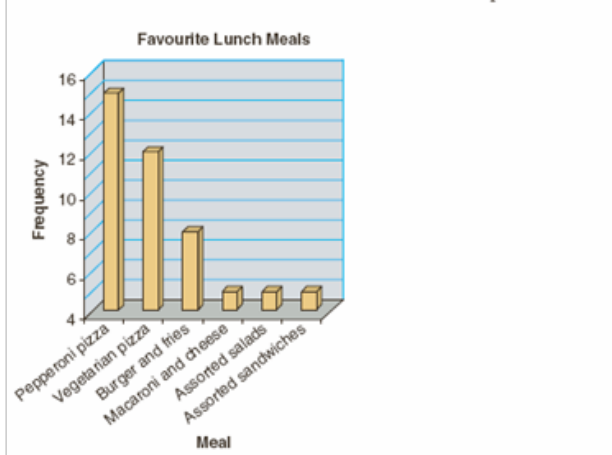
POLL RESULT

What sport are you most likely to follow on TV this weekend?

Basketball	296 votes	(4 %)
Football	3000 votes	(38 %)
Figure skating	1368 votes	(17 %)
Hockey	3192 votes	(41 %)

2.

Four Grade 9 students collected data on school lunch preferences.



They concluded:

We asked students to tell us their favourite lunch meals and displayed the results in this bar graph. We conclude that the school cafeteria should serve more pizza since it is clearly the favourite lunch of students.

Is this conclusion valid?

3.

A reporter from a TV news show asks 5 people on the street this question: "In light of the many recent home invasions, do you think police are doing all they can to keep us safe?"
 Four of those interviewed say the police are not keeping us safe.
 On the news that evening, the reporter announces, "4 out of 5 citizens are worried about personal safety," and then shows the interviews. What is wrong with this statistical analysis?

4.

The prom committee researched four possible locations for the prom.

- They wanted the graduating students to make the final selection.
- They provided homeroom teachers with copies of a questionnaire to hand out to all graduating students.
- They received completed questionnaires from 85% of the graduating students.

The questionnaire, a graph of the results, and their conclusion are shown. Is the conclusion valid? Justify your answer.

Where would you like to have the prom this year? Please check one.

Crystal Fountain

Empire Hotel

Winston's

Palace Ballroom

Prom Choices

Location	Percentage
Winston's	55%
Empire Hotel	19%
Crystal Fountain	15%
Palace Ballroom	11%