

## 2.4 Worksheet – Survey Design and Bias

MDM4U

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**1)** For each of the following questions, state if it is an open question, rating question, ranking question, checklist question, or information question.

**i)** Please provide the following information:

Gender: \_\_\_\_\_ Grade: \_\_\_\_\_

### *INFORMATION*

**ii)** Please provide the following information

Gender: ☐ M ☐ F      Grade: ☐ 9 ☐ 10 ☐ 11 ☐ 12

### *INFORMATION*

**iii)** With 1 meaning most helpful and 10 meaning not at all helpful, rate each of the chapters of the textbook.

_____ Chapter 1	_____ Chapter 2	_____ Chapter 3
_____ Chapter 4	_____ Chapter 5	_____ Chapter 6

### *RATING*

**iv)** Rank the chapters of this textbook in order from 1---6 (1 being most useful).

_____ Chapter 1	_____ Chapter 2	_____ Chapter 3
_____ Chapter 4	_____ Chapter 5	_____ Chapter 6

### *RANKING*

**2)** Describe the characteristics of a good question and what good questions must avoid.

*Good questions are specific, simple, relevant, readable. Good questions avoid jargon, abbreviations, negatives, being leading, and insensitivity*

**3)** Using your criteria from the previous question, evaluate the following survey questions and re---write the question to meet all of the criteria of a good question.

**a)** Should the OMB be funded to initiate waste audits across the province?

☐Y

☐N

*abbreviation; Should the Ontario Municipal Board be funded to initiate waste audits across the province? ☐Y ☐N*

**b)** Given the large amount of sulfur dioxide that is spewed out of smelters, should mining companies be forced to clean up their act? Please comment.

*leading, insensitivity; Should mining companies be forced to decrease the amount of sulphur dioxide being emitted at smelters? Please comment.*

**c)** On a 5---point scale, do you agree with the bleeding---heart Liberals that all corporations should pay higher taxes? (1: totally agree, 5: totally disagree)

*leading, insensitivity; On a 5--point scale, do you agree that all corporations should pay higher taxes? (1: totally agree, 5: totally disagree)*

**d)** Why shouldn't forestry companies clear cut? Please explain.

*jargon, negatives; Should forestry companies be able to cut down all trees in certain areas? Explain.*

**4)** For each of the following questions, state if it is an open question, rating question, ranking question, checklist question, or information question.

**a)** You are presently in grade (circle the appropriate answer):

9      10      11      12

*INFORMATION*

**b)** I find mathematics stimulating because:

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*OPEN*

**c)** Rank the following foods from favourite (1) to least favourite (4).

\_\_\_\_\_ pizza

\_\_\_\_\_ hamburgers

\_\_\_\_\_ tacos

\_\_\_\_\_ watermelon

*RANKING*

**d)** Do you wear a wristwatch?

\_\_\_\_\_ always      \_\_\_\_\_ sometimes      \_\_\_\_\_ seldom      \_\_\_\_\_ never

**INFORMATION**

**e)** How much do you like math on a scale of 1 to 5 (1 being the lowest)

**RATING**

**f)** Estimate your net income:

\_\_\_\_\_ \$15000---\$19999      \_\_\_\_\_ \$20000---\$39999      \_\_\_\_\_ \$40000---\$59999      \_\_\_\_\_ \$60000 +

**INFORMATION**

**5)** Explain the difference between primary and secondary data.

*If you conduct a survey and collect information firsthand, this is called primary data. This type of data is easy to work with because you control how it is collected.*

*Information obtained from similar studies conducted by OTHER researchers is called secondary data.*

**6)** Identify the type(s) of bias that might result from each of the following data collection methods.

**a)** You hand out surveys to your classmates to be returned to you next week.

*NON---RESPONSE – some students will not return the survey*

**b)** You are interested in the study habits of grade 12 students, so you interview students from your class.

*SAMPLING BIAS – the students in this one particular class may not represent all grade 12's. Students with similar traits tend to take the same types of classes. This is a convenience sample which will always lead to sample bias.*

**c)** You ask students about their recycling habits on behalf of the Greenteam, the school environment club.

*RESPONSE BIAS – since you are asking on behalf of the Greenteam, students may feel pressured to give answers that they know the Greenteam would like to hear instead of giving honest answers. Anything in the survey method that causes people to give incorrect answers creates a response bias.*

**d)** You take a random sample of 5 students from each block A class to determine their attitudes toward the new school attendance policy.

*HOUSEHOLD BIAS – not all classes are the same size. Classes should be surveyed proportionately, not equally. Smaller classes are over represented in this scenario.*

**7)** When a phone questionnaire is conducted, many people with call display will not answer their phone. What kind of bias does this represent? What can be done to minimize this kind of bias?

*NON---RESPONSE BIAS – company can block name from call display to reduce this bias*

**8)** Suppose you want to know the average amount of money spent by the fans attending opening day for the Toronto Blue Jays. You get permission from the team's management to conduct a survey at the stadium, but they will not allow you to bother the fans in the club seating or box seats (the most expensive seating). Using a computer, you randomly select 500 seats from the rest of the stadium. During the game, you ask the fans in those seats how much they spent that day. What type of bias is present in this survey method?

*SAMPLING BIAS – because you are sampling only from the lower priced ticket holders, this will likely produce an estimate that is too small and not representative of the entire population.*