

## 2.4 Worksheet – Survey Design and Bias

MDM4U

David Chen

**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: \_\_\_\_\_

**ii)** Please provide the following information

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

**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

**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

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

**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

**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.

**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)

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

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

---

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

\_\_\_\_\_ pizza          \_\_\_\_\_ hamburgers          \_\_\_\_\_ tacos          \_\_\_\_\_ watermelon

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

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

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

**f)** Estimate your net income:

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

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

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

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

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

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