

# **Organization of Data for Analysis**

## **Extra Practice**

MHR Page 246 #s 1 - 5, 8 & 9

# **Solutions**

1. Which of these are significant numbers?

- A Facebook surpasses 1 trillion page views per month.
- B Health care spending in Ontario will go up by \$2.1 million.
- C On average, a person will breathe about 500 million times in their life.
- D Approximately \$135 million is donated to the Canadian Cancer Society each year.

**A**

For a number to be significant, you need to compare it to what usually happens to try to give it some perspective.

2. Which of the following is not a valid sampling method?

- A Order data from highest to lowest, randomly select one item, and then choose every fifth value after that.
- B Put all the data into a bin and randomly select as many as you wish.
- C Arrange the data into demographic groups and pick 100 from each group.
- D Send out a survey and ask people to fill it out and send it back.

**B**

A - This is a systematic sample

C - This is a stratified sample

D - This is a voluntary sample

3. Which of these is a good survey question?

- A Where do you get most of your information on video games and movies?  
 Friends  Game store  Internet  TV
- B Should formula sheets be allowed on math exams?  
 Strongly agree  Agree  Don't know  
 Disagree  Strongly disagree
- C Which uniforms do you prefer for the football team, the new modern style or the old style?  
 New  Old
- D What is your favourite sport?  
 Soccer  Tennis  Volleyball  Golf

**B**

A & D - Only has limited options

C - Leading question, so it is biased

4. Which situation comprises microdata?

- A the average height of students in each class in your school
- B the height of every student in your school
- C the total number of recycled cans collected by each school
- D the average annual salary of citizens in different cities

**B**

A & D - Data are averages, so this is aggregate data

C - Data is summarized, so again it is aggregate data

5. Describe why these situations have bias and what you could do to eliminate it.

- a) A company comes door-to-door selling rooftop solar panels. The sales representative claims that by the end of the third year you will be making more than \$500 per month.
- b) Your teacher explains a difficult topic and then asks the students if they understand.

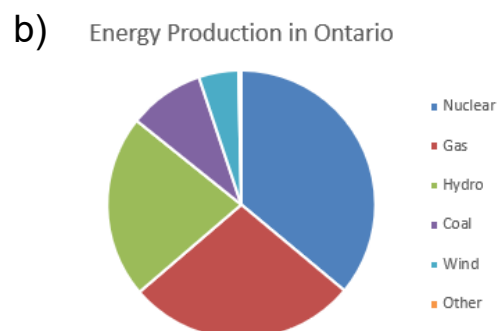
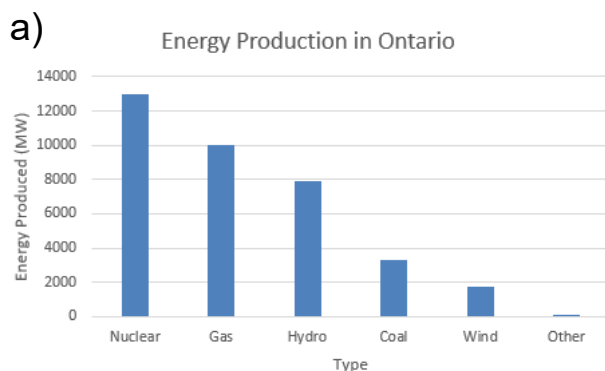
a) Sales people will often say whatever they need to do to get a sale. The claim that you will save \$500 per month by the end of the third year, would need to have some detail to justify that sort of claim.

b) This is an example of response bias, because it is unlikely that students will admit to not understanding what has just been taught to them. To eliminate this bias, teachers could have exit cards to try to get a feel for how well students thought they understood what had been taught.

8. The table shows data on energy production in Ontario.

Type	Nuclear	Gas	Hydro	Coal	Wind	Other
Energy Produced (MW)	12 998	9987	7939	3293	1725	122

- a) Create a graphical representation of the data that is not misleading.
- b) Create a graphical representation of the data that is misleading. Explain why it is misleading.



The pie chart is misleading in that there is no scale to signify the size of each sector in MW, just the proportion of energy produced compared to the other forms of production.

9. Researchers surveyed 881 people to find out what province each person was born in.

NFLD	PEI	NS	NB	QUE
18	10	36	16	225
ONT	MAN	SASK	ALTA	BC
301	29	33	80	133

- a) Graph these data.
- b) What type of sampling method was likely used? Why?
- c) The researchers also collected data from a much larger group about the number of trips people made.

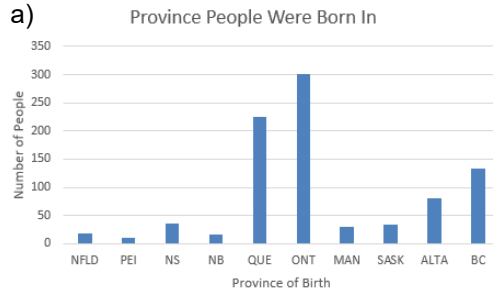
NFLD	PEI	NS	NB	QUE
3500	1091	8115	5458	60169
ONT	MAN	SASK	ALTA	BC
90174	7984	8624	21558	22380

A newspaper published the headline "Ontarians travel much more than people from other provinces." Why might this headline be incorrect?

- d) How could the data be displayed more accurately?

c)

Province	People	% Surveyed	Trips	% Surveyed
NFLD	18	2.04%	3500	1.53%
PEI	10	1.14%	1091	0.48%
NS	36	4.09%	8115	3.54%
NB	16	1.82%	5458	2.38%
QUE	225	25.54%	60169	26.27%
ONT	301	34.17%	90174	39.37%
MAN	29	3.29%	7984	3.49%
SASK	33	3.75%	8624	3.77%
ALTA	80	9.08%	21558	9.41%
BC	133	15.10%	22380	9.77%
<b>Totals</b>	<b>881</b>	<b>100%</b>	<b>229053</b>	<b>100%</b>



b) It is likely that a stratified sample was used. The percentages from the sample match the percentages of where Canadian's live by province.

Using the previous data from the stratified sample we can see that Ontarians do travel more than people from other provinces, but not much more. In fact, it is people from NB who travel the most when compared to their population size.

- d) To display the data more accurately they should state the percentage of people that travel, instead of the number of trips taken. Number of trips could be inflated by some people going to on multiple trips per year.