

# Solutions

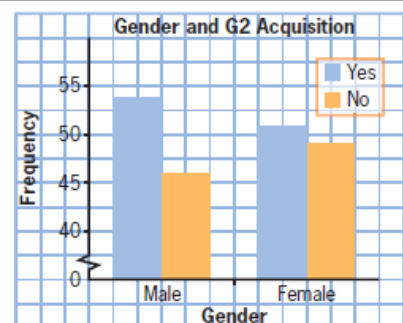
1. Grade 12 students were divided into two groups, male and female, and asked if they have successfully acquired a G2 driver's licence. Based on the results shown below, does gender appear to have an effect on whether or not a grade 12 student has their licence? Explain your reasoning.

$$\text{Number of males} = 54 + 46 = 100$$

$$\text{Number of females} = 51 + 49 = 100$$

Sample sizes are the same. There is a slightly higher frequency of males who have their G2 licence, but over 50% of both genders have it.

**Conclusion:** Gender does **NOT** appear to have an effect on whether or not a G12 student has their G2 licence.



2. To decide on a reasonable price for a bottomless cup of hot chocolate, a cafe owner recorded the number of cups each customer ordered on a winter morning.
- a) Will these data offer a reliable data set? Explain.
- b) How might the cafe owner ensure a reliable and valid source of data?

2	1	2	3	0
1	1	1	2	2
1	3	1	4	2
0	1	2	3	1

a) No, the results are unlikely to be reliable. The cafe owner only has 20 pieces of data, which is a very small sample size to offer reliable results.

b) To get a reliable AND valid set of results, the owner should increase the sample size and attempt to get a more diverse set of respondents, so that it more accurately represents all of their customer base.

3. In a split bar graph,

- A the parts are compared to the whole
- B the bars are divided into categories
- C each bar displays a total
- D all of the above

**D** - It's all of them!

4. Which of the following best describes reliable data?

- A represents the entire population
- B can be duplicated
- C you can trust the sample responses
- D none of the above

**B** - Reliable data. Valid data represents the whole population.

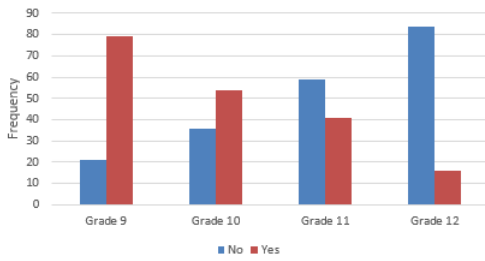
6. Students were asked whether they ate their lunch in the school cafeteria. The table summarizes their responses.

- a) Create a multiple bar graph, a split bar graph, and a relative split bar graph to represent the data.  
 b) Which graph is more informative? Why?

	No	Yes
Grade 9	21	79
Grade 10	36	54
Grade 11	59	41
Grade 12	84	16

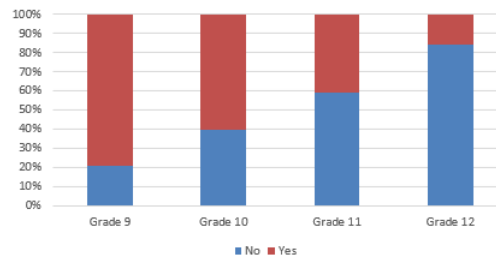
**Multiple Bar Graph**

Eat Lunch in the Cafeteria?



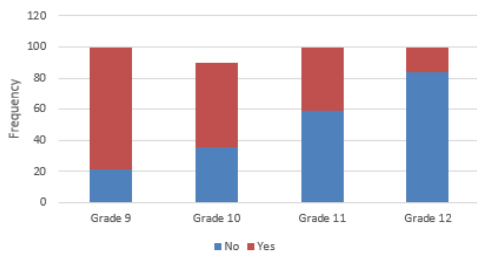
**Relative Split Bar Graph**

Eat Lunch in the Cafeteria?



**Split Bar Graph**

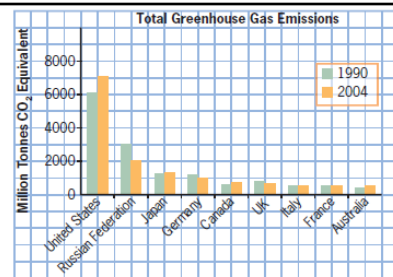
Eat Lunch in the Cafeteria?



b) Sample sizes are similar but not identical so using the relative split bar graph is probably best, so that you can see the percentage of each grade that use the cafeteria.

8. Application The graph below had the headline, "Is climate change really happening?"

- a) What do you think the author is trying to illustrate with this graph?  
 b) Is there enough evidence to suggest Russia is one of the most polluting countries on the list?  
 c) Is there enough evidence to suggest Russia has done the most to reduce greenhouse gases?  
 d) Critically analyse the information in the graph and the headline.

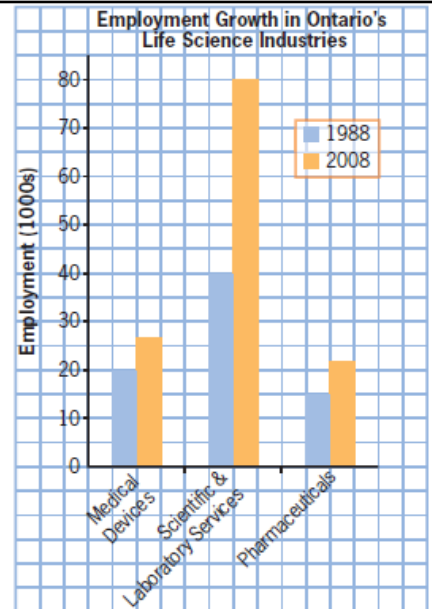


- a) It looks like the author is trying to illustrate that greenhouse gas emissions have gone up for most countries in that 14 year period.  
 b) Russia is the second biggest producer of greenhouse gases on this list. However, they have produced the biggest drop in the study period, whilst most of the others have increased theirs. There also are bigger producers who are not on this list (eg China and India). You could argue this either way based upon the evidence presented.  
 c) Despite having the biggest drop, the graph doesn't say WHY the drop occurred, so we can't say that they have done the most to cause this reduction.  
 d) The title "Is Climate Change Really Happening?" implies that it isn't, because most of the countries stated have actually increased their CO<sub>2</sub> emissions, not reduced them. The graph doesn't include every country though, only the nine that are stated so again, this could be misleading!

13. a) What is implied by this graph?  
 b) Where would you look if you were to try to validate the data?

a) This graph implies that Life Science Industries is a fast growing industry and that Scientific and Laboratory Services is the fastest growing sector within it.

b) You can try to validate this data by looking on [statcan.gc.ca](http://statcan.gc.ca) (Statistics Canada website).



Source: Statistics Canada (Labour Force Survey) and Ontario Ministry of Finance.

16. A store manager wants to show head office that sales are increasing dramatically, given that the sales for six months are \$321 587, \$335 892, \$336 998, \$340 256, \$348 640, and \$359 361.

- a) Draw a graph to accurately represent the data.  
 b) Draw a graph to show a dramatic increase in sales.

