How weird is our class?

Have you ever wondered how your class differs from other Canadian students your age? This activity will allow you to compare the survey results from your class with those from Canadian students.

First go to www.censusatschool.ca and click on Data and results. Go to the most recent Canadian summary results. (You could also retrieve a large random sample of Canadian results using the international random data sampler).

Then compare your class data with the national data and **answer the following questions:**

1. Does our class attach more or less importance to recycling than other Canadian students our age?

2. Do we have a larger or smaller proportion of students who have allergies?

3. Are we taller or shorter than students the same age across Canada?

4. Do we have similar or different opinions about why some kids bully others?

5. Does it take us more or less time to travel to school?

Now, compile the results of your research to answer the following questions:

6. Is our class weird? How did we make our decision?

7. Why would differences exist between one class and the national sample?

8. What are some of the potential dangers of making generalizations about an entire population based on a select sample?

Teacher's notes

Possible approaches:

1. Discuss the concepts of negligible difference and confidence intervals with your students.

2. Encourage your students to explore, present and discuss different ways of comparing the data to answer questions 1 to 5 (e.g., graphing, comparing averages).

3. Have your students use their analysis to debate whether or not the class is weird.

4. Have your students work in groups. Divide up the questions so that each group answers one of the first five questions. Then hold a mock conference to have them present their results to the rest of the class. Allow them to debate the resolution of whether or not the class is weird.

Outcomes:

- Students analyse sets of data to make comparisons.
- Students are able to discuss and determine the most suitable method(s) of displaying data.
- Students discuss how collected data are affected by the nature of the sample, the method of collection, the sample size, the type of data and biases.

Enrichment for math class:
Contributed by Anna Spanik, Math teacher, Halifax Nova Scotia, and Joel Yan, Statistics Canada

1. Discuss the differences among the following types of variables:
   - **categorical or non-numeric** variables (e.g. allergies: *yes, no; eye colour: blue, green, brown*)
   - **grouped or discrete** numeric variables (e.g. bullying: *0, 1-3, 4-9 times*)
   - **ungrouped or continuous** numeric variables (e.g. height: *cm*; travel to school: *minutes*)

2. Encourage your students to explore different methods of comparing the class data with the national data to answer questions 1 to 5:
   - using frequency tables
   - using various graphing techniques such as bar charts, pictographs, pie charts, histograms, scatter plots and box and whisker plots

- comparing different measures of central tendency (mean, median, mode).

The methods used will differ depending on the type of variable.

- With a **categorical** variable, we can determine the mode (i.e. the category with the highest frequency), but we cannot calculate a median or mean value. In fact, the mean and median do not really make sense here.
- With a **grouped numeric** variable, we can determine the mode (i.e. the group with the highest frequency) and find out what group contains the median, but we cannot determine a precise value for the median or the mean.
- The graph types primarily used to represent **categorical** and **grouped numeric** variables are bar graphs, pictographs and pie graphs.
- With a **continuous numeric** variable, we can calculate the actual mean, median and modal values. We can use a box-and-whisker plot to display the median, the range of values, and the distribution into quartiles. We can also use histograms for displaying the distribution of values. Scatter plots are also very useful for showing the relationship between any two continuous numeric variables.

Original lesson contributed by Florence Glanfield and Janelle Tang, University of Saskatchewan