**Unit 11**

**Design and Carry Out an Experiment**

**Lesson Outline**

**BIG PICTURE**

Students will:
- explore everyday situations to gather data;
- collect, organize, display and analyse data;
- distinguish between types of data, e.g., primary, secondary, discrete, continuous, census, sample;
- add histograms and scatter plots to their repertoire of data display techniques;
- develop an appreciation for the differences in display-effect of various forms of data display as it relates to poorer or better communication of information;
- determine appropriate measures of central tendency;
- learn to use data in supporting inferences and making convincing arguments;
- pose a question and design and carry out an experiment to test it.

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| 1   | A Picture Is Worth a Thousand Words *(lesson not included)* | - Read and interpret the information shown on a variety of graphs.  
- Redisplay the data imbedded in several given graphs using tables/charts as well as different forms of graphs.  
- Investigate through discussion which forms of display communicate the contained information best.  | 8m71, 8m73, 8m75, 8m77  
CGE 2b, 2c |
| 2–4 | Reliable Data? *(lessons not included)* | - Design and conduct a census of one or more classes on some measurable attribute, e.g., shoe size.  
- Record collected measurements and calculate the mean, median, and mode.  
- Create a new record using a sample only of the original collected data and again calculate the mean, median, and mode.  
- Determine which measure of central tendency was most appropriate in each case.  
- Discuss census, representative sample, sample size, and population.  | 8m68, 8m72, 8m74  
CGE 4b, 5e, 7f |
| 5   | Did We Count or Measure? *(lesson not included)* | - Show examples of graphs displaying categorical data, i.e., data that is labelled or in categories, e.g., hair colour, gender, opinions about favourite music (usually summarized using percents or proportions).  
- Show examples of graphs that display discrete data, i.e., data collected by counting, e.g., scatter plots showing number of times students are late for class, the number of successful shots a basketball player takes from various distances away from the basket.  
- Show examples of graphs that display continuous data, i.e., data collected by measuring, e.g., cholesterol levels, heights, time.  
- Find, collect, and organize examples of categorical, discrete, and continuous data.  
- Identify the collected data as primary or secondary.  | 8m68, 8m70, 8m75  
CGE 4b, 3c |
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| 6    | Different Displays for Counting and Measuring         | • Investigate the similarities and differences in samples of primary and secondary data that have been displayed as histograms and bar graphs.  
• Find and graph data that is spread over a wide range.  
• Discuss the differences associated with primary and secondary data. | 8m69, 8m75   |
|      | *(lesson not included)*                               |                                                                                     | CGE 3c, 7f   |
| 7, 8 | Is There a Relationship Here?                        | • Design a survey (or experiment) to compare two attributes or characteristics.  
• Collect, organize, and graph the data using a scatter plot.  
You are the Researcher:  
http://www19.statcan.ca/02/02_037_e.htm  
Sample student projects:  
http://www19.statcan.ca/02/02_036_e.htm  
Make an argument based on the analysis of the data in its various forms of display, e.g., table, graph. | 8m76, 8m78, 8m79 | CGE 5e, 5g |
| 9–11 | Summative Assessment                                  | • Students pose a question/hypothesis and design and carry out an experiment to answer/test it. |              |