Unit 11
Design and Carry Out an Experiment

Grade 8

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.

Day	Lesson Title	Math Learning Goals	Expectations
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

Day	Lesson Title	Math Learning Goals	Expectations
6	Different Displays for Counting and Measuring *(lesson not included)*	• 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 CGE 3c, 7f
7, 8	Is There a Relationship Here? *(lessons not included)*	• 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.	