Lesson 22: Histograms

SP3: Construct, label, and interpret histograms to solve problems.

We love to use graphs to represent data visually. (Our brains love pictures and color). In middle school, you made lots of bar graphs to display data. This year, we are going to focus on histograms. They look like a bar graph with the exception that there are no gaps between bars. The data is shown as continuous data via intervals.

https://www.mathsisfun.com/data/histograms.html

Here is a summary of what a histogram is:

Histograms are similar to bar graphs, except that histograms express continuous data and bar graphs express discrete data (see examples of a bar graph and histogram below). Students have learned in previous grades as well as in PR1, that continuous data is different from discrete data.

The first step in creating a histogram is to group a continuous sequence of numerical data (e.g., ages, time, heights, percentages, etc.) into appropriate **intervals** or **classes**. The data is arranged in a **frequency table**. The **range** of the interval is used to determine the width of the bars which should be neither too narrow nor too broad. Intervals are typically the same size and the number of intervals is usually kept to between 4 and 10

For histograms, the values on the x-axis (and x- column) indicate the boundaries of the intervals. A number at the lower boundary will be included but a number at the upper boundary will not be included. For example, in the histogram graph below, for ages 10-20, the data for a concert-goer who was 19 would be included, but a 20-year old would be in the 20-30 group.

When drawing the histogram, the height of each bar is determined by the number of pieces of data that are included in the interval. Since the data in histograms is continuous, there are no spaces between the bars. All data must included. If there is an interval that contains no pieces of data, a space is left where that bar would have been drawn.

Like other data displays, all histograms must include a meaningful **title**, **labels for the axes**, and **values** to indicate the intervals of the data. The axes labels should include units where applicable (e.g years, seconds, centimetres, percentages). The values for the intervals should be displayed <u>at the limits of the bars</u>.
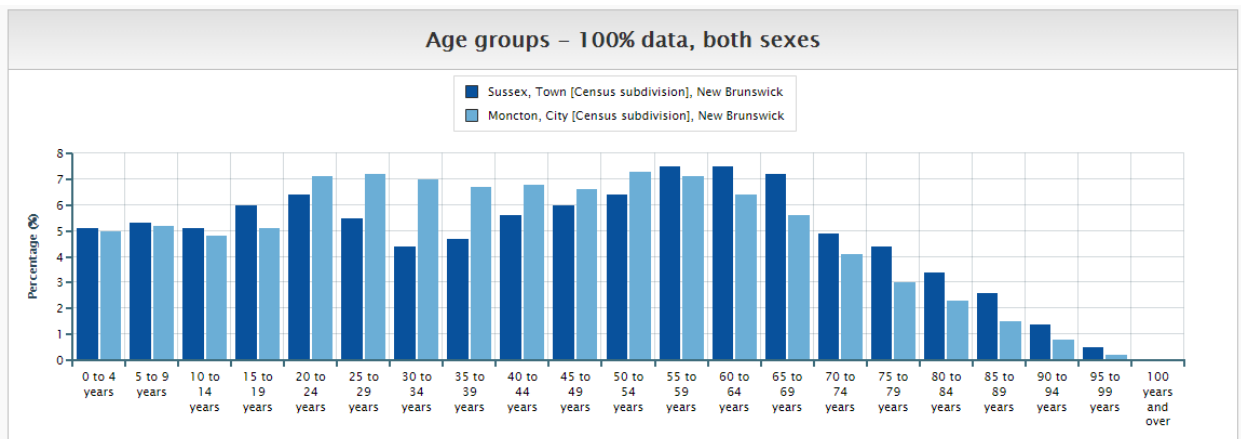
Bar Graph

Number of people and their favourite sports
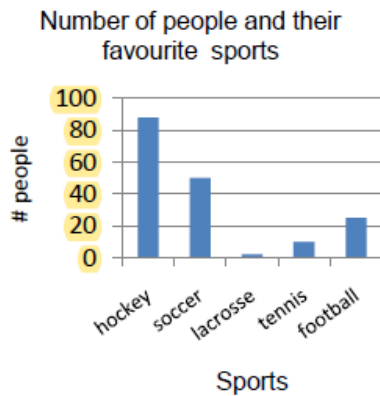
Histogram

Frequency Table	
Ages	Frequency
0-10	20
10-20	80
20-30	120
30-40	80
40-50	60
50-60	40

Ages of People at a Concert
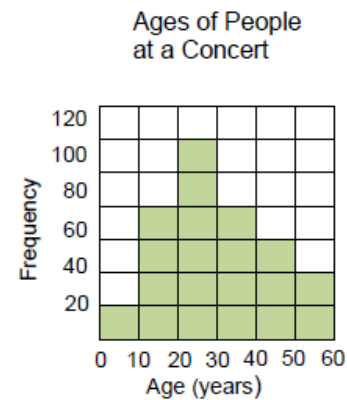
Statistics Canada generates a variety of graphs to display data from the 2016 census. Below, you will see a comparison of population distribution between Sussex and Moncton.

Age groups – 100% data, both sexes

■ Sussex, Town [Census subdivision], New Brunswick
■ Moncton, City [Census subdivision], New Brunswick

Because this is hard to see, I have attached the link here:
https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page_Figures.cfm?Lang=E&Tab=1&Geo1=CSD&Code1=1305022&Geo2=CSD&Code2=1307022&SearchText=moncton&SearchType=Begins&SearchPR=01&B1=All&TABID=1&type=0

Click on topic and select another one- income, language, housing etc. and click on submit. It is really amazing what you can see and compare. I even changed Moncton to Toronto to Vancouver and made comparisons. The point it, we are surrounded by data. We must ensure that we are always using a valid source of data. The Stats Can data is incredible!

Our New Brunswick Government updates the COVID-19 data daily.

Here is your assignment:

Our New Brunswick government updates the COVID-19 data daily. To date (April 22), there have been 118 confirmed cases of COVID-19 in the province. Create a histogram that displays the number of confirmed cases of COVID-19 in each age category.

***Update: As of April 29th, this data is the same. There have been zero new confirmed positive cases of COVID-19 in the last 11 days!!!!! Our curve has been FLAT for 11 days!
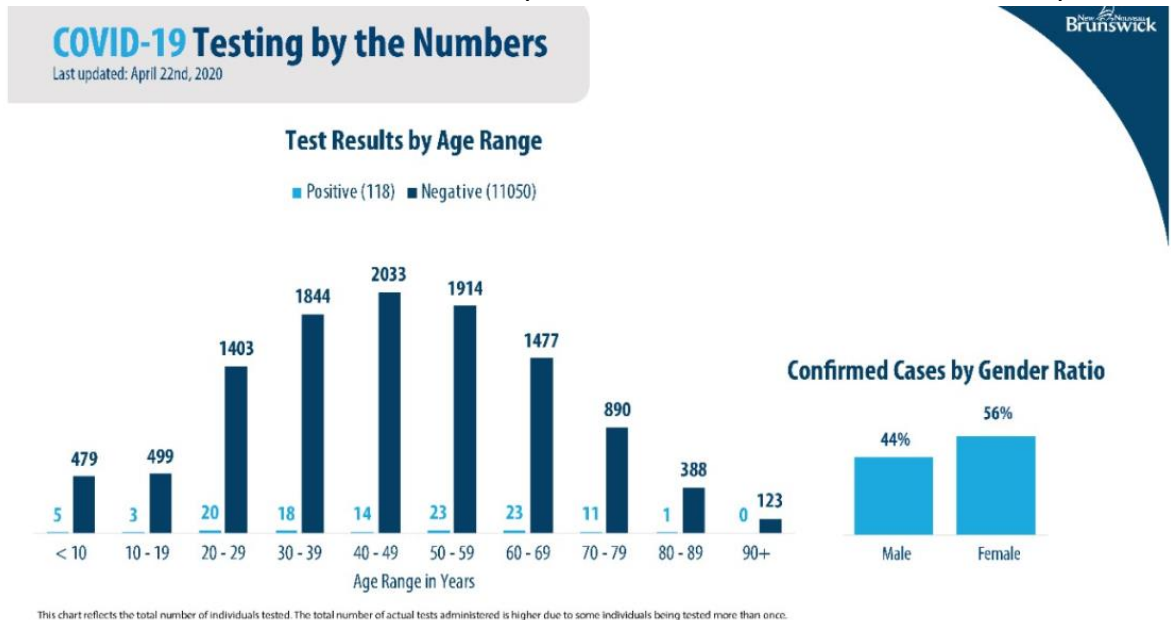
1. In your notebooks on page 63, complete the following table, using the graph above, to help you in displaying your data

x axis Age in years	y axis # of confirmed positive cases of COVID-19 in NB
0-9	5
10-19	3
20-29	20
30-30	18
40-49	
50-59	
60-69	
70-79	
80-89	
90 plus	
TOTAL	118

2. If you do not have any graph paper at home, do your best to make some. Draw vertical lines on your loose-leaf. (I know. I do not have graph paper at home either. It is ok. It is non-essential).
3. Title your histogram.
4. Label and number your x axis (in increments of 10)
5. Label and number your y axis
6. And, we can check that outcome off our list! Well done and pertinent. We are not displaying data on pizza and favorite classes. We are displaying current valid data from the government regarding the pandemic here in our own province. The goal of this is not to stress you, it is to educate you. NB has fared very well thus far in #flatteningthecurve because of #stayhome and #socialdistancing. Well done!

Check your histogram with mine below.

# of cases of COVID-19 in NB

# of cases (y-axis): 24, 22, 20, 18, 16, 14, 12, 10, 8, 6, 4, 2

AGE IN YEARS (x-axis): 0-9/10, 10-19/20, 10/20, 30, 40, 50, 60, 70, 80, 90, 100