| Standards	**PS.SPID.1*** Select and create an appropriate display, including dot plots, histograms, and box plots, for data that includes only real numbers
Learning Targets/I Can Statements	I can create, compare, and analyze side by side histograms on comparable scales to compare two groups. I can create, compare, and analyze side by side boxplots to compare the distributions of two or more groups. I can describe the differences among groups in terms of patterns and changes in their center, spread, shape and unusual values.
Essential Question(s)	**How can I analyze real life data displayed through multiple representation?**
Resources	https://www.mathgames.com/skill/6.126-interpret-box-and-whisker-plots http://www.shodor.org/interactivate/activities/Histogram/ https://www.mathgames.com/skill/5.12-interpret-line-plots-with-up-to-5-data-points
Learning Activities or Experiences	1st: Recall questions (attached) 2nd: Watch the Khan Academy video (link above) a. Line Plots b. Box Plots Alternative: Notes on Line Plots, Box Plots 3rd: Box and Whisker plots, Line Plots, Histograms Interactive Activities 4th: Assignment

Recall Questions

1. Calculate the mean from the data below.
$$23, 25, 24, 19, 18, 25, 24, 20$$

2. What is the range from the data below?
$$110, 119, 98.5, 100, 121, 111$$

3. Look at the data collected from high students' sleep hours. What is the median and mode?
$$8, 6, 3.5, 4, 9, 7, 4, 9, 8, 5, 7$$

4. Thomas collected data pertaining to the ages in his family. Which measure of central tendency was the greatest?
$$12, 14, 3, 38, 26, 40, 70, 62$$
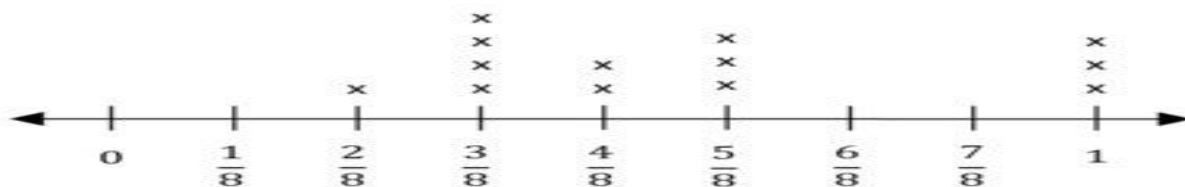
Displaying and Analyzing Data
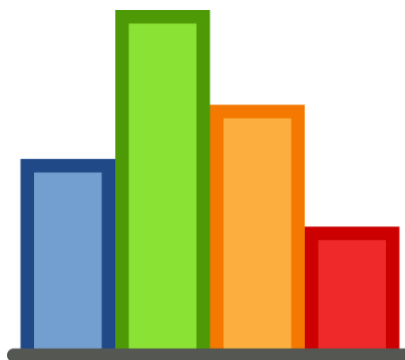
Data - facts and statistics collected together for reference or analysis.

Frequency - is the number of occurrences of a repeating event per unit of time.

Different Representation

Data

Line Plot - is a graph that shows frequency of data along a number **line**.

In order to construct a line plot.

Step 1: Draw a number line.

Step 2: Place the number in order from least to greatest (Make sure all the numbers from the data is represented on the line plot)

Step 3: Above each number, place an X for each time the number is represented.

Step 4: Your amount of x's on the line plot should reflect the amount of numbers in your data set.
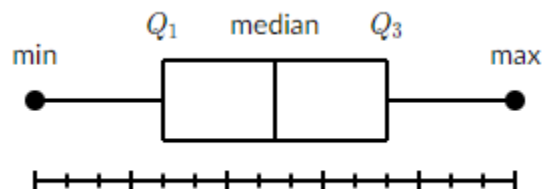
A line plot is usually used to calculate the mode of the data.

Your turn: Create a line plot from the data set below. Tell the mode of the data set.

9, 10, 3, 5, 8, 7, 2, 3, 4, 5, 9, 9, 12, 10, 3

Place line plot here:

Box Plot (**box and whisker**) - is a standardized way of displaying the distribution of data based on the five number summary: minimum, first quartile, median, third quartile, and maximum.

There are **5 data points** on a box and whisker plot.

Median: the middle number in the set of data. (least to greatest)

Minimum: the smallest number in the set of data.

Maximum: the largest number in the set of data.

Quartile 1: The median of the 1st part of the data.

Quartile 3: The median of the 3rd part of the data.

The data is divided into 25% increments. (minimum to Q1, Q1 to median, median to Q3, Q3 to maximum)

Box Plots breaks down the data in percentage.

Example: Finding the five-number summary

A sample of 10 boxes of raisins has these weights (in grams):

25, 28, 29, 29, 30, 34, 35, 35, 37, 38

Make a box plot of the data.

Step 1: Order the data from smallest to largest.

Our data is already in order.

25, 28, 29, 29, 30, 34, 35, 35, 37, 38

Step 2: Find the median.

The median is the mean of the middle two numbers:

30+34=64 then divide by 2

64/2

The median is 32.

Step 3: Find the quartiles.

The first quartile is the median of the data points to the left of the median.

25, 28, {29}, 29, 30

Q1 = 29

The third quartile is the median of the data points to the right of the median.
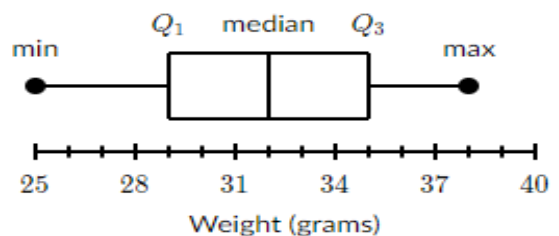
34, 35, {35}, 37, 38

Q3 = 35

Step 4: Complete the five-number summary by finding the min and the max.

The min is the smallest data point, which is 25.

The max is the largest data point, which is 38.

The five-number summary is 25, 29, 32, 35, 38.

Your Turn:

Create a box plot for the following data.

45, 36, 39, 42, 38, 23, 37, 29, 30, 29

Place box plot here:

What is the median?

What is the Q1?

What is the Q3?

What is the range?

What is the interquartile range?