

## Measures of Location

### Mean

Commonly known as the average. The methods for calculating are:

1.  $\frac{\sum x}{n}$  Add each data point (x), and then divide by the total number of data points (n).
2.  $\frac{\sum fx}{n}$  Multiply each data value by its frequency, add them together, and then divide by the total number of data points.
3.  $\frac{\sum fx}{n}$  Multiply the mid-point of each class interval by its frequency, add them together, and then divide by the total number of data points.

### Median

The middle value when the data points are sorted. If there is an even number of data points, then take the mean of the middle two data points.

### Quartiles

Quartiles use **percentiles**. A **percentile** is a value such that p percent of the numbers fall at or below that value.

For quartiles, you would find 3 numbers such that:

- 25% are at or below the first number
- 50% are at or below the second number and above the first number
- 75% are at or below the third number and above the second

You find the numbers by using **locators**. A locator simply determines which values from the data set you would use to calculate the number.

1. Calculate the locator as follows:  $L = p \times n / 100$ , where p is the percentile value and n is the number of data points.
2. If the locator is a whole number, then calculate your number by taking the mean of the data points at the locator position and the next position.
3. If the locator is not a whole number, round it up to the next higher whole number, and use the data point in that position.

### Mode

The data point with the highest frequency.

Chapter 14	Descriptive Statistics: Graphing and Summarizing Data
Section 3	Numerical Summaries of Data

## The Five-Number Summary and Box Plots

The five-number summary consists of:

1. The minimum value
2. The first quartile
3. The median
4. The third quartile
5. The maximum value

A box plot is constructed as follows:

1. Plot the five values on a number line.
2. Above the number line, draw a box that stretches from the first quartile to the third quartile.
3. Draw a vertical line inside the box at the point of the median.
4. Draw a horizontal line extending from the middle of the left side of the box to the minimum.
5. Draw a horizontal line extending from the middle of the right side of the box to the maximum.