**Statistics**

**Mean**

The mean (or average) is the most popular and well-known measure of central tendency. It can be used with both discrete and continuous data, although its use is most often with continuous data (see our Types of Variable guide for data types). The mean is equal to the sum of all the values in the data set divided by the number of values in the data set. So, if we have values in a data set and they have values…, the sample mean, usually denoted by (pronounced "x bar"), is:

**Median**

The median is the middle score for a set of data that has been arranged in order of magnitude. The median is less affected by outliers and skewed data.

**Mode**

The mode is the most frequent score in our data set. On a histogram it represents the highest bar in a bar chart or histogram. You can, therefore, sometimes consider the mode as being the most popular option.

One of the problems with the mode is that it is not unique, so it leaves us with problems when we have two or more values that share the highest frequency. We are now stuck as to which mode best describes the central tendency of the data. This is particularly problematic when we have continuous data because we are more likely not to have any one value that is more frequent than the other. This is why the mode is very rarely used with continuous data. Another problem with the mode is that it will not provide us with a very good measure of central tendency when the most common mark is far away from the rest of the data in the data set. To use the mode to describe the central tendency of this data set would be misleading.

**Variance**

Variance measures how far a data set is spread out. It is mathematically defined as the average of the squared differences from the mean.

To calculate the variance, follow these steps:

1. Work out the Mean (the simple average of the numbers)
2. Then for each number: subtract the Mean and square the result (the squared difference).
3. Then work out the average of those squared differences.

For example, the heights are: 600mm, 470mm, 170mm, 430mm and 300mm.

Find out the Mean, the Variance, and the Standard Deviation.

Your first step is to find the Mean:

|  |  |  |
| --- | --- | --- |
| Mean | = | (600 + 470 + 170 + 430 + 300)/**5** |
|  | = | 1970/**5** |
|  | = | 394 |

so, the mean (average) height is 394 mm.

To calculate the Variance, take each difference, square it, and then average the result:

σ2 = (2062+ 762+ (−224)2+ 362+ (−94)2) / 5, which equals 21,704.

**Standard Deviation**

The square root of the variance is the standard deviation. While var. gives you a rough idea of spread, the standard deviation is more concrete, giving you exact distances from the mean.

σ= 21704 (1/2) which equals 147(approx.)