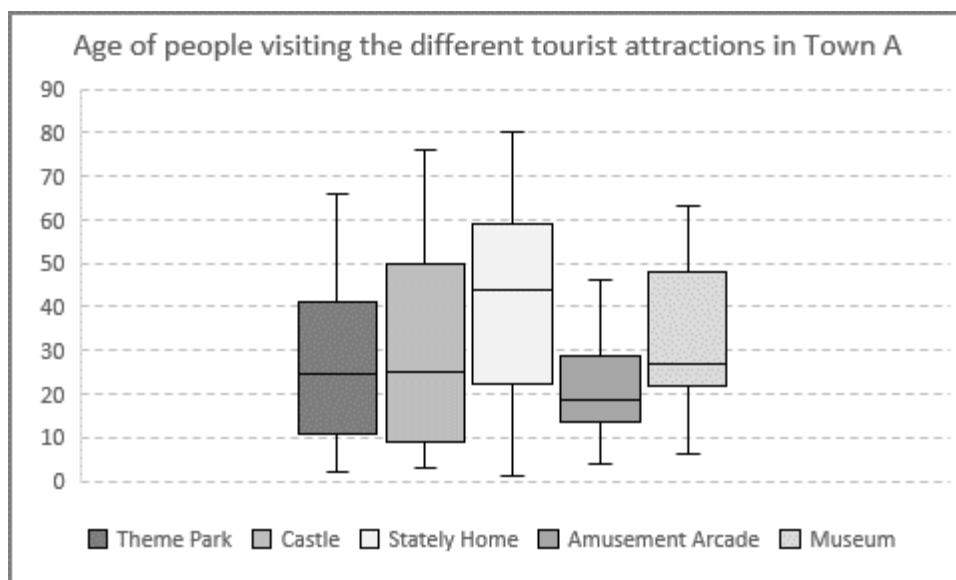


# 3e – A Guide to Box and Whisker Graphs

Box and whisker graphs are used to show the spread of a data set across a range of values. The bars on the chart appear to 'float' with their extent covering the most frequently quoted values in the data set. The top of the box is placed on the lower (or first) quartile value, while the bottom of the box extends to the upper (or third) quartile. The  $x$  axis generally shows the different categories of data (such as different locations).

## Why would we use a box and whisker graph?

A researcher would use a box and whisker graph rather than any other method when they need to compare distributions of a number of variables quite directly with each other. The many elements to a box and whisker graph means that one graph can show a number of different data points.



## Worked Example:

There are a number of ways of calculating the first and third quartile values. The following method represents a simple and commonly used method, but it is by no means the only method and spreadsheet packages that can calculate the lower and upper quartiles automatically may use a different method.

Firstly, the data should be placed in value order from lowest to highest.

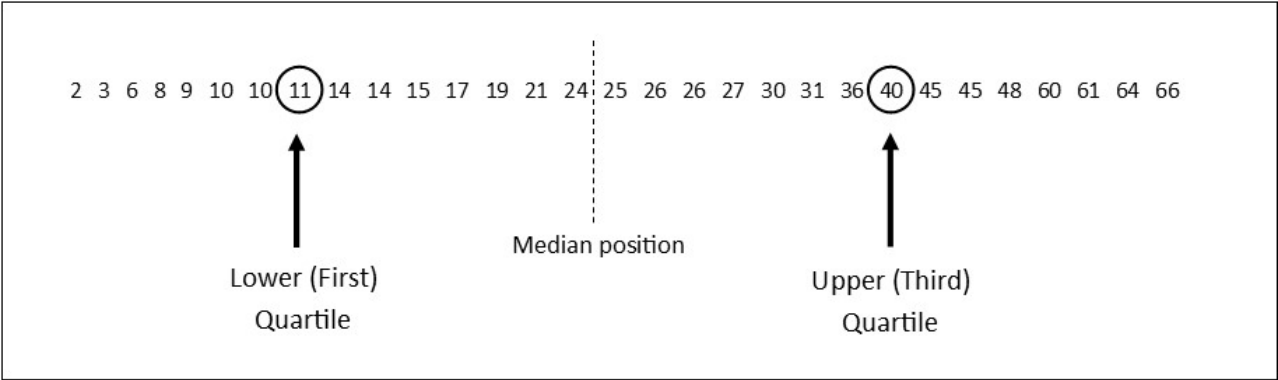
Theme Park:

2 3 6 8 9 10 10 11 14 14 15 17 19 21 24 25 26 26 27 30 31 36 40 45 45 48 60 61 64 66



By dividing the total number of values by two, you can find the median value (that that falls exactly in the centre of the range of data). If the total number of values is odd, the median will represent an actual value within the set. If the total number of values is even, (as in the above example), the median represents a position between two values.

The lower quartile sits between the median point and the minimum value, representing twenty-five percent of the total number of values. Similarly, the upper quartile is the value that sits between the median point and the maximum value, representing seventy-five percent of the total number of values.



At the top and bottom of each box on the chart, 'whiskers' can be added. These are lines that extend out to the minimum and maximum values within each data set. Additionally, a line can be drawn in the centre of the box to show the median value for each set.

