## KEYWORDS:

**Averages**    Includes Mean, Median and Mode

**Mean**    Add all the data together and divide by the number of values

**Median**    The middle value when the data has been ordered, smallest to largest

**Mode**    The piece of data that occurs the most

**Range**    Difference between the biggest and smallest data values

## Averages from a list

### 8, 3, 8, 2, 12, 9

Work out the averages for the list of numbers above:

Mean: $\dfrac{8 + 3 + 8 + 2 + 12 + 9}{6} = \dfrac{42}{6} = 7$

Add all the values and then divide by the number of values

Mode: $2, 3, 8, 8, 9, 12 \rightarrow 8$

Find the number that comes up the most

Range: $12 - 2 = 10$

Largest number take away the smallest

Median: $2, 3, 8, 8, 9, 12 \rightarrow 8$

Put the numbers into numerical order and find the middle value

$\dfrac{8 + 8}{2} = 8$

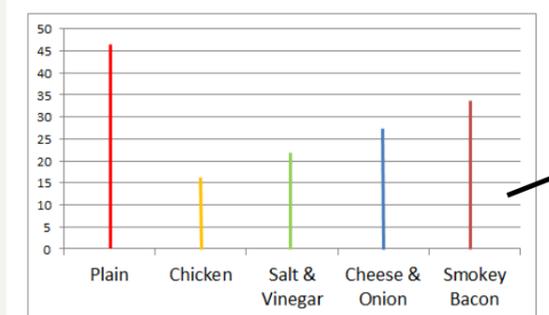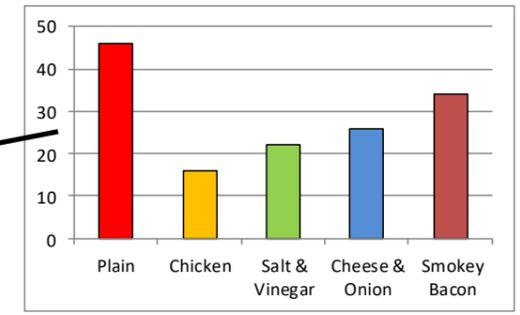If there are two number, find the mid point by adding them and divide by 2

**Videos S6 and S7**

## Types of charts

This is a bar chart

Key things to remember is that there are equal gaps between each bar

Make sure you always label your axes

This is a vertical line graph

You can also draw this horizontally if you swap the axes

Make sure you always label your axes

**Videos S2a and S2b**

## Averages from frequency tables

You can only work out the **modal group** with a group frequency table. This is the group with the highest frequency

$10 \le h < 20$

You can only estimate the **range** with a group frequency table.

You will need to use the largest possible value in the final group and the smallest possible value in the first group

$60 - 10 = 50$

| Height (cm) | Frequency | |
|---|---|---|
| $10 \le h < 20$ | 46 | => 15 x 46 = 690 |
| $20 \le h < 30$ | 16 | => 25 x 16 = 400 |
| $30 \le h < 40$ | 22 | => 35 x 22 = 770 |
| $40 \le h < 50$ | 26 | => 45 x 26 = 1170 |
| $50 \le h < 60$ | 34 | => 55 x 34 = 1870 |

Again you can only estimate the **median** currently from a grouped frequency table.

Start off by adding all the values up to work out which position the middle height is (total = 144, median is between the 72nd and 73rd height).

Finally work out which group this height fits into by adding the frequencies together

Median group is $30 \le h < 40$

You can only work out an estimated **mean** from a grouped frequency table.

**First**, find the midpoint of each group. This is the estimate bit.

**Second**, multiply each mid point by that group's frequency.

**Third**, add up these values to get a total.

$690 + 400 + 770 + 1170 + 1870 = 4900$

**Finally,** divide this number by the frequency total

$4900 \div 144 = 34.03$ (2 DP)

**Videos S10a and S10b**

## Drawing Pie charts

Start off by adding the frequencies to get a total

To calculate how many degrees each person is worth you need divide 360 by the total.

$360 \div 144 = 25$

| Crisp Sales | Frequency | |
|---|---|---|
| Plain | 46 | => 46 x 2.5 = 115 |
| Chicken | 16 | => 16 x 2.5 = 40 |
| Salt & Vinegar | 22 | => 22 x 2.5 = 55 |
| Cheese & Onion | 26 | => 26 x 2.5 = 65 |
| Smokey Bacon | 34 | => 34 x 2.5 = 85 |
| | **144** | |

When asked to draw the pie chart, carefully use a protractor to draw each angle inside a circle, starting from the new line you have just drawn each time

Next, multiply each frequency by this value, this will work out the **angle** of each section in the pie chart.

## Interpreting Pie charts

We can see that Plain crisps were liked the most from this pie chart as it has the biggest section, so this is the **mode**.
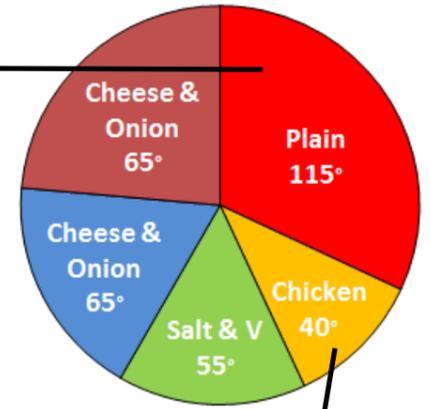
To work out how many people each section represents you need a total number of people (either for a section or the whole chart).

$\dfrac{\text{Degrees in section}}{360} \times total$

Chicken $\dfrac{40}{360} \times 144 = 16$

**Video S9**