Mean, Median,Mode and Range

5,3,9,1,3,2,7,2,3

Median= 1,2,2,3,3,3,5,7,9

If there are an even number of pieces of data, the median will be the MIDPOINT of the two middle pieces of data: 2,3,5,7,9,10 Midpoint of 5 and 7 is 6

Mode = Most 1,2,2,3,3,3,5,7,9 = 3 (you can have more than one mode)

Mean= sum of data ÷ total pieces of data (1+2+2+3+3+3+5+7+9) ÷ 9 = 3.9 (1dp)

Range= Biggest –smallest= 9-1=8

Types of data:

Qualitative: Data which is descriptive, uses words not numbers. E.g: Green, blue, orange.

Quantitative: Measures quantities using numbers. E.g: Shoe sizes, Heights.

Continuous: Data that can take any numerical value in a range. E.g: Time, Weight, Distance, Money

Discrete: Data which can only take specific values. E.g: Rolling a dice, flipping a coin.

	Advantages	**Disadvantages**	**Example**
Mean	Uses all the data. The most used average.	May not be representative when the data contains extreme values.	1,1,1,2,4,15 Mean= $\frac{1+1+1+2+4+15}{6}$ = 4
Median	Only looks at the middle values, so it is a better average to use when the data contains extreme values.	Not all values are used, so could be misleading	**1,1,3,5,10,15,20** **Median = 5**
Mode	It is the most common value. Can be used for non-numerical data. When the mode is an extreme value, it is misleading to use it as an average.	May not exist.	**Weekly wages of a boss and his four staff:** **£150, £150, £150, £150, £1000** **Mode=£150**
Range	It measures how spread out the data is	It only looks at the two extreme values, which may not represent the spread of the rest of the data.	1,2,5,7,9,40 Range = 40-1=39 Without the last value the range would only be 8

Linked Prior Topics:
- Basic calculations
- $(+, -, \times, \div)$
- Ordering numbers.

Vocabulary:
Averages, Data, Discrete, Continuous, Qualitative, Mode, Mean, Median, Range, Stem and Leaf.

Linked Future Topics:
(Grouped) Frequency tables, Cumulative frequency, frequency polygons, box plots, histograms.

Mean from grouped data

The test scores given in **Q2** have been grouped in this table.

Score	Frequency
1–5	5
6–10	6
11–15	9
16–20	10

Add a column to calculate the midpoint of each class. Use this as an estimate of the scores, because you don't know the exact values in each class

Work out an estimate for the mean.

Score	Frequency, f	Midpoint of class, m	$m \times f$
1–5	5	3	15
6–10	6	8	48
11–15	9	13	117
16–20	10	18	180
Total	**30**	Total	**360**

Add a column, $m \times f$, to calculate an estimate of the total score for each class.

Estimate of mean $= \frac{360}{30} = 12$

Divide the total of the $m \times f$ column by the total frequency.