

Essential knowledge

- Understand and use mean, median, mode and range
- Choose the most appropriate average
- Identify outliers
- Compare distributions using averages and range

Key Vocabulary

- Spread:** the distance/ how spread out/ variation of data
- Average:** a measure of central tendency or the typical value of all the data together
- Total:** all the data added together
- Frequency:** the number of times the data values occur
- Represent:** something that shows the value of another
- Outlier:** a value that stands apart from the data set
- Consistent:** a set of data that is similar and doesn't change very much

Prior learning links

- Statistics (Y6)
- Addition and Multiplication Problems (Y7)
- Representing Data (Y8)

Choosing the Appropriate Average

Here are the weekly wages of a small firm

£240	£240	£240	£240	£240
£260	£260	£300	£350	£700

Averages must be representative of the data compared to the set as a whole

Mean = £310
Median = £250
Mode = £240

As most of the people get paid £240, the mean and median are too high to be representative.

Identifying Outliers

Outliers are values that stand well apart from the data.

These can have a large effect on the range and mean

Height in cm
152 150 142 158 182 151 153 149 156 160 151 144

This outlier provides context to the data. Perhaps this person might be an adult amongst a group of children, so should be ignored.

Mean, Median, Mode

24, 8, 4, 11, 8

Mean = 55
(Total) ÷ 5
(number of values = 11

Mean – One value that captures the sense of all the data.

Find the sum of the data (add the values)

Divide the overall total by how many pieces of data you have

4, 8, 8, 11, 24
4, 8, 8, 11, 24

Median – The value in the centre (in the middle) of the data, once it has been put in order

Mode = 8

Mode – This is the number OR the item that occurs the most (it does not have to be numerical)

Comparing Distributions

Comparisons should include a statement of average and central tendency, as well as a statement about spread and consistency.

Scores in Cricket Games

Lucy: 45, 32, 37, 41, 48, 35
James: 60, 90, 41, 23, 14, 23

Lucy

Mean: 39.6 (1.d.p), Median: 38. Mode: no mode, Range: 16

James

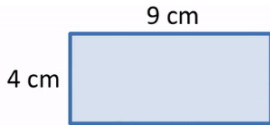
Mean: 41.8 (1.d.p), Median: 32, Mode: 23, Range: 76

“James is less consistent than Lucy because his scores have a greater range.

Lucy performed better on average because her scores have a similar mean and a higher median”

Prior learning links

Find the area and perimeter of this shape:



Calculate:

$$0.5 \times 12 \times 8 =$$

$$15^2 =$$

Key Vocabulary

Define the following key words:

Area -

Perpendicular Height -

Radius -

Mean, Median, Mode

Simone records the number of minutes spent on her mobile phone over 7 days:

8 5 13 6 24 19 1

Calculate:

(a) Mean

(a) Median

(a) Mode

Choosing the Appropriate Average

A football team record how many goals they score in their league games

0 3 0 1 15 1 0 9 7

(a) Mean = $36 \div 9 = 4$

(b) Median = 1

(c) Mode = 0

Comment on the amount of goals they score. Which average is the most appropriate?

Identifying Outliers

A teacher surveys a group of students. He asks how much pocket money they receive each week. They respond

	£5
£8	£4
£50	£6
£8	£7.50
£10	£8 £7

Which amount is the outlier?

What reason(s) might there be for this value?

Should we still include this in the data?

Area of Compound Shapes

Two pupils are in training for a 100m sprint. Their test runs are as follows (all times are given in seconds):

Pupil A: 20, 19, 22, 18, 20, 21, 18, 35

Pupil B: 18, 19, 18, 21, 21, 21, 23, 22

Calculate the mean, median, mode and range for each pupil.

Use these measures to compare the speed of each pupil.