Statistical Measures

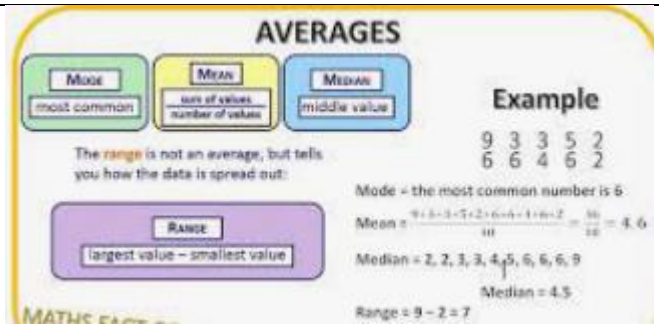
Key Knowledge/Prior Learning KS2/3 and Retrieval and Suggested Starters
• BIDMAS • Inequalities • Multiplication and division • Midpoints • Estimation • Solving Equations • Angle facts

KS3 National Curriculum – what students will be practicing and Key Questions
Averages: • Mean, mode, median and range • Averages from a frequency table • Estimate of the mean from a grouped frequency table • Estimate of the median from a grouped frequency table. • Reverse and combined mean

Specific Ambitious Knowledge

Key Vocabulary/Literacy Opportunities
• Primary Vs Secondary Data • Average • Mean, mode, median, range • Modal Class Interval • Spread • Frequency • Inequalities • Sum (Sigma) • Estimate • Discrete Vs Continuous data • Quantitative Vs Qualitative Data • Representative

Key Formulae/Knowledge and Misconceptions
Averages and range



Mean from a table

Number of people	Frequency	Number × Frequency
1	5	1 × 5 = 5
2	6	2 × 6 = 12
3	3	3 × 3 = 9
4	2	4 × 2 = 8
	n = 16	Total = 34

Dividing by the number of categories and not the total frequency

Mean from a group frequency table

Marks scored	Frequency	Mid-point	Frequency × Mid-point
0 - 9	3	$\frac{0+9}{2} = 4.5$	3 × 4.5 = 13.5
10 - 19	5	$\frac{10+19}{2} = 14.5$	5 × 14.5 = 72.5
20 - 29	8	$\frac{20+29}{2} = 24.5$	8 × 24.5 = 196
30 - 39	4	$\frac{30+39}{2} = 34.5$	4 × 34.5 = 138
	n = 20		Total = 420

- Dividing by the number of categories and not the total frequency
- Not using decimals as a midpoint (or difficulty with the midpoint).

Combined Mean

: There are 12 boys in a class with a mean test score of 15 and 18 girls in the class with a mean test score of 17.
What is the combined class mean?

$$\text{CM} = \frac{\text{Mean}_{\text{Boy}} \times \text{No of Boys} + \text{Mean}_{\text{Girl}} \times \text{No of Girls}}{\text{No of Boys} + \text{No of Girls}}$$

$$= \frac{15 \times 12 + 17 \times 18}{12 + 18}$$

$$= \frac{180 + 306}{30}$$

$$= 16.2$$

Maths in Context (Historical, Real Life and Student Thinking Points)

Projects/Enrichment/Investigations
• Unequal averages: https://nrich.maths.org/unequal?utm_source=secondary-map • Who's the best?: https://nrich.maths.org/whosthebest?utm_source=secondary-map • What's the weather like? : https://nrich.maths.org/whatstheweatherlike?utm_source=secondary-map (could be completed using spreadsheets for calculations using excel). • Olympic Records: https://nrich.maths.org/records?utm_source=secondary-map Project Ideas: Psychology/Geography – links to other data such as Spearman's Rank