

Collecting, representing and interpreting data

Topic Overview: Collecting, representing and interpreting data

This topic builds on KS3 work on the collection, representation and use of statistics to describe data. Much of the content is used in other subjects such as Geography and Science and in everyday life. The steps balance consolidation of existing knowledge with extending and deepening, particularly in terms of interpretation of results and evaluating and criticising statistical methods and diagrams. Topics covered include describing, interpreting and comparing discrete, continuous and grouped data, constructing and interpreting appropriate tables and charts, describing, interpreting and comparing distributions and using appropriate measures of average and spread

Learning Sequence:

Understand populations and samples: Students should be aware that the ‘population’ is the whole group being studied and discuss the merits of random sampling

Construct a stratified sample: (H) Students consider proportional reasoning finding the fraction each group/stratum is of the whole population and assign the same fraction to each group

Primary and Secondary data: Building on from sampling, students discuss the merits of using primary and secondary data sources

Construct and interpret frequency tables and frequency polygons: Students are familiar with frequency tables for grouped data from KS3 and can also link to the idea of the midpoint being used to find the estimate of the mean

Construct and interpret two-way tables: (R): This revision step is an opportunity to revisit both extracting and completing information as well as designing tables

Construct and interpret line, bar and pie charts: Students have constructed these charts previously and this is a revision step. Students explore multiple and composite bar charts as extension, focusing on interpretation. With pie charts, again focus is on interpretation, considering proportions and percentages

Construct and interpret pie charts: (R): Students need to be able to construct and interpret pie charts. Also to consider the pros and cons of using a pie chart over a bar chart

Criticise charts and graphs:

Construct and interpret histograms: (H): This step explores why grouped frequency diagrams are not appropriate for unequal class intervals as using height to represent frequency can be misleading. Frequency in histograms is proportional to the area of the bar. Students also deduce frequencies from a given histogram

Recap and extend averages: (R): Student revise and recap knowledge of the mean, mode and median averages and the appropriate use of each, considering averages from a table and grouped frequencies

Time series graphs: (R): Again, emphasis on this revision point is placed on interpretation of graphs

Construct and interpret stem and leaf diagrams: As with most of the diagrams in the block, interpretation is just as important as construction. Students compare stem and leaf diagrams to horizontal bar charts where all the data is visible, and revisit averages and the range

Construct and interpret cumulative frequency diagrams and use to find measures: (H): Students must consider the ‘upper limit’ when plotting these curves. Building on this, students find the mean, median and related measures such as the interquartile range from cumulative frequency diagrams

Box plots: (H): Students consider box plots in relation to cumulative frequency diagrams and how they facilitate comparison of two or more data sets

Comparing distributions: Students need to consider both averages and measure of spread when comparing distribution, using the interquartile range and the range in the higher tier to make comparisons

Scatter graphs: (R): Students revise scatter graphs and plotting lines of best fit, and then consider extrapolating information outside the data range.

Sequence of Learning:		Topic Resources:	
1	Understand populations and samples	Knowledge Maps:	Statistics – ungrouped data Statistics – grouped data
2	Construct a stratified sample (H)		
3	Primary and secondary data		
4	Construct and interpret frequency tables and frequency polygons		
5	Construct and interpret two-way tables (R)	Assessment:	
5	Construct and interpret line bar and pie charts (R)	Knowledge:	2x 20 mark end of topic assessment
6	Histograms (H)	Application of Knowledge:	Termly summative assessment
7	Recap and extend averages (R)	Supportive Reading:	
8	Time series graphs (R)	Any supported reading listed here	Sparx Maths www.sparxmaths.co.uk
9	Construct and interpret stem and leaf diagrams		Corbett Maths : www.corbettmaths.com
10	Cumulative frequency diagrams (H)		AQA Revision Guide
11	Box plots (H)		
12	Compare distributions		
13	Scatter graphs (R)		