

STATISTICS – CURRICULUM INTENT

ASPIRE – CHALLENGE – ACHIEVE

Statistics is arguably the most versatile area of mathematics. The skills developed in this course complement not only the study of Mathematics, but also Science, Geography, Business Studies, and Sports Science to mention just a few. With a strong focus on technical communication and precise written work, students also acquire a set of very specific literacy skills.

Every element of this GCSE Statistics course is built around the data handling cycle: specify the problem, collect the data, analyse the data, and interpret the results. Our young statisticians develop the confidence to work with many statistical techniques, including sampling, representing data with diagrams, and performing sophisticated calculations such as standard deviation and Spearman's rank coefficient. The course takes students far beyond mathematical processes, it aims to foster critical thinking. Students are encouraged to decide whether data is clean and fit for purpose, to identify the most appropriate calculations to perform on it, and to detect misleading information. At the heart of this course is the ability to understand the underlying meaning of data and to effectively communicate it.

Students spend a proportion of their time working on a computer. Large sets of data are analysed using IT. Students are often fascinated by the up to date data collected by the Office for National Statistics. They are also inspired as they investigate diverse human populations around the globe and hypothesise about the sometimes, stark differences they find.

To engage students, teachers use real life data and contexts. Students plan and conduct their own statistical enquiries and present their conclusions to their peers. Students are encouraged to develop their decision-making skills, their attention to detail and their statistical reasoning ability.

It has been said that the world's most valuable resource is no longer oil, but data. It is our mission to prepare our students for life in this fast-changing world, to understand it and fully participate in it.

STATISTICS – WIDER CURRICULUM

KS4	
Competitions	Department competition to bring in the most statistically misleading article, news items or online content.
Other	Student led statistical enquiry project. Intervention classes will be provided as needs are assessed.

STATISTICS – CURRICULUM MAP

Collection of data	Processing, representing and analysing data	Probability
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Key = Matching colours denote links between topics either in content or skills across Key Stage 3 and 4

STATISTICS content of KS3 Mathematics

7	2-4	Presentation of Data		
	4-9	Measuring Data	Presentation of Data	
8	2-4	Measuring Data	Presentation of Data	
	4-6	Measuring Data	Presentation of Data	
	6-9	Measuring Data	Presentation of Data	Basic Probability
9	Foundation	Basic Probability	Scatter Graphs	
	Higher B	Scatter Graphs	Basic Probability	
	Higher A	Basic Probability	Collecting and Representing Data	Scatter Graphs

By the end of KS3 pupils will become confident in calculating statistical measures, constructing various tables, charts and diagrams and be able to recall this knowledge accurately. They will be able to reason on statistical concepts and use them to describe and compare data sets and detect relationships between variables. They will be able to justify their arguments using statistical language. They will be able to measure probability using increasingly sophisticated techniques and understand the concepts behind them.

GCSE STATISTICS

10	Planning	Types of Data	Population and Sampling	Estimation	Collecting Data	Tabulation, diagrams and representation	Measures of central tendency	Measures of dispersion	Scatter diagrams and correlation
11	Time series	Experimental and Theoretical Probability	Index Numbers	Probability distributions	Standardised Scores	Quality assurance	Mini – Investigation	Revision	

By the end of KS4 pupils will demonstrate knowledge and understanding of statistical techniques used to collect and represent information and calculate summary statistics and probabilities. Students will be fluent in the use of the statistical enquiry cycle. They will be able to interpret results in context and reason statistically to draw conclusions. They will be skilled in using suitable terminology and notation and will be able to assess the appropriateness of a statistical methods given a particular context.

STATISTICS - SKILLS / KNOWLEDGE PROGRESSION BY THEMES

Collection of data	Processing, representing and analysing data	Probability
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Year 7		<p>2-4 Construct and interpret bar charts, pictograms, and line graphs.</p> <p>4-9 Understand measures of location and spread; mean, mode, median and range.</p> <p>6-9 Find averages from frequency tables</p> <p>4-9 Construct and interpret pie charts, pictograms, and line graphs.</p> <p>6-9 Understand comparative bar charts.</p>	
Year 8		<p>2-4 Understand measures of location and spread; mean, mode, median and range.</p> <p>2-4 Construct and interpret pie charts, bar charts, and line graphs.</p> <p>4-6 Find averages from frequency tables. Missing data problems.</p> <p>4-6 Understand comparative bar charts.</p> <p>6-9 Find averages from frequency tables including from grouped data. Analyse and compare sets of data.</p> <p>6-9 Choose an appropriate statistic to describe a data set.</p> <p>6-9 Create and interpret scatter diagrams and understand correlation.</p>	<p>6-9 Use basic vocabulary of probability.</p> <p>Understand the probability scale.</p> <p>6-9 List possible outcomes including the use of a sample space diagram.</p> <p>6-9 Work with and understand the limitations of theoretical probability.</p> <p>6-9 Use the concept that probabilities sum to one.</p> <p>6-9 Frequency trees.</p> <p>6-9 Basic Venn diagram work.</p>
Year 9	Higher - Know and understand the terms primary data, secondary data, discrete data and continuous data	<p>Use and interpret scatter diagrams. Recognise correlation, draw lines of best fit and make predictions.</p> <p>Higher - Interpret and construct tables, charts and diagrams.</p> <p>Higher – Compare the distributions of data sets including the use of box plots.</p> <p>Higher - Construct and interpret histograms and cumulative frequency diagrams.</p>	<p>Conduct probability experiments using tables and frequency trees.</p> <p>Apply the property that an exhaustive set of outcomes sum to one</p> <p>Use and interpret sample space diagrams</p>
Year 10	<p>Hypothesis planning and designing investigations.</p> <p>Types of data.</p> <p>Populations and sampling.</p> <p>Collecting data by experiment and questionnaires.</p> <p>Avoiding bias</p>	<p>Use summary statistics to make estimations of population characteristics.</p> <p>Capture, recapture method.</p> <p>Tabulation</p> <p>Representing data including population pyramids, choropleth maps and comparative pie charts.</p> <p>Comparisons of different representation formats and consideration of skewness.</p> <p>Measures of central tendency including weighted and geometric mean.</p> <p>Measures of dispersion including standard deviation. Identifying Outliers.</p> <p>Scatter diagrams including understanding/calculation of Spearman's rank correlation coefficient. Pearson's product moment correlation coefficient.</p>	
Year 11	The statistical enquiry cycle: mini-investigation.	<p>Time series and moving averages. Identifying trends and cyclical/seasonal variation.</p> <p>Further summary statistics including weighted index numbers.</p> <p>Standardised scores and quality assurance.</p>	<p>Experimental and theoretical probability.</p> <p>Representing outcomes by use of two way tables, tree diagrams, sample spaces and Venn diagrams.</p> <p>Normal and binomial probability distributions.</p>

(Bold – Higher Tier Only)