



## Statistics Curriculum Overview Plan

### Whole school curriculum intent

Develop a broad and balanced curriculum that enables students to learn, recall and apply knowledge and skills across different contexts, supported by a robust and consistent approach to assessment. This will lead to successful and resilient lifelong learners who can cope in a range of changing contexts.

### Key stage 3/4 subject curriculum intent

We believe that it is vital that young people have a good understanding of statistics to help in their work, further study and more generally to understand the use of statistics by the media, government and other agencies to help make informed judgements. It is a crucial life skill.



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Year Group		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7	Topic						
	Core knowledge from this topic						
	Links to the national curriculum						
	Previous content that this topic builds upon						
	Key vocabulary						
	Development of cultural capital						
	Development of reading						
	Concepts –what will students be able to do at the end of the topic						
Year Group		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 8	Topic						
	Core knowledge from this topic						
	Links to the national curriculum						
	Previous content that this topic builds upon						
	Key vocabulary						
	Development of cultural capital						
	Development of reading						
	Concepts –what will students be able to do at the end of the topic						
Year Group		Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Year 9	Topic	<b>Introduction to Statistics</b>	<b>Using Hypothesis</b>	<b>Understanding different types of data</b>	<b>Reviewing data</b>	<b>Analysing and Interpreting Graphs</b>	<b>Histograms and Cumulative frequency</b>
	Core knowledge from this topic	<p>A1 Understand what a hypothesis is and how it might be tested</p> <p>A2 Understand factors that may constrain how an investigation is carried out</p>	<p>Students should be able to:</p> <ul style="list-style-type: none"> <li>recognise a hypothesis</li> <li>write a hypothesis appropriate for an introduced context</li> <li>understand the difference between a</li> </ul>	<p>B2c Understand validity and reliability as detailed in B2b</p> <p>B2b Summary lesson – understand the relative benefits of the different</p>	<p>B5b Understand the possible need to clean data including on spreadsheets and the techniques required</p> <p>B5c Understand extraneous variables, how to identify and control them</p>	<p>C1a Understand how to draw a back-to-back stem-and-leaf diagram including the importance of a key</p> <p>C1a Understand how to interpret stem-and-leaf and back-to-back stem-and-leaf diagrams</p>	<p>C2 Understand how to draw and interpret line charts</p> <p>C2 A basic understanding of time series and scatter charts (both to be covered in more detail later)</p>



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	<p>A3 Understand the necessary and preferably proactive strategies that might be necessary to avoid the issues raised above when undertaking an investigation</p> <p>B1a B2a Know the different types of data that arise and investigate situations when these types arise</p> <p>Understand that a clear knowledge of the data type is key to understanding how to correctly interrogate the data</p> <p>Understand the potential dangers of using secondary data</p> <p>B1c Understand the terms 'explanatory' / 'response' and 'dependent' / 'independent'</p> <p>B2b Understand the difference between a census and a sample, possibly referencing the National Census as an example</p> <p>B2b Understand different types of experiments and observation including the implications for level of control</p> <p>E2a Understand that comparing outcomes with predictions can be used to identify possible bias in the design</p> <p>B2b E3d Understand how to reference and interpret secondary sources – working online if possible to interrogate well known</p>	<p>hypothesis and a research question understand that support or otherwise for a hypothesis is through the data that is collected.</p> <ul style="list-style-type: none"> <li>know what difficulties might occur when trying to collect data and plan in advance how to overcome such problems if possible</li> <li>understand and discuss strategies to improve response rates to questionnaires and surveys</li> <li>make decisions regarding outcomes and whether to include them or not in the analysis.</li> </ul>	<p>methods of data collection recently considered</p> <p>B3a B3b Understand what a population is in different circumstances, the use of sample frames and sampling in general</p> <p>B3c B3d Understand the different types of sampling from the specification in an outline way</p> <p>B3c Understand the reasons for use of and dangers of convenience sampling</p> <p>B3d Understand the concept of and how to carry out a systematic sample</p> <p>B3d Understand the concept of and how to carry out a quota sample</p> <p>B3d B3e Understand the concept of random sampling and how to carry it out using the different methods listed in the specification</p> <p>B3f Understand the concept of stratification and the necessary calculations and rounding issues that may arise</p> <p>B5a Understand how to deal with issues that arise with collected data including sessions on internet collected data</p>	<p>B5 B3 Review and revision - Methods of data selection and collection</p> <p style="text-align: center;">Assessment on work done so far</p> <p>C1a Understand how to tally and tabulate data including the use of different labelling systems</p> <p>B1b Understand the implications of merging classes for continuous data</p> <p>C1a Understand the use and misuse of pictograms</p> <p>C1a Understand how to draw a standard pie chart</p> <p>C1a Understand how to interpret pie charts already drawn or generated by the student</p> <p>C1b Understand how to construct a comparative pie chart for two data sets</p> <p>C1b Understand how to interpret and work with comparative pie charts and other 3D visualisation methods</p> <p>C1a Understand how to draw a stem-and-leaf diagram including the importance of a key</p>	<p>C1a Understand how to interpret Venn diagram</p> <p>C1a Understand how to draw Venn diagrams from information given</p> <p>C1a C4b Summary lesson – Understand the types of data for which the diagrams covered so far are suitable</p> <p>C1b Understand how to interpret choropleth maps</p> <p style="text-align: center;">Review and revision</p> <p>C1b Understand how to interpret and compare data sets shown in population pyramids</p> <p>C2 Understand how to draw and interpret a basic bar chart and bar line chart</p> <p>C2 Understand how to draw and interpret dual and composite bar charts</p> <p>C2 Understand how to draw and interpret percentage bar charts</p>	<p>C2 Understand how to draw a frequency polygon</p> <p>C2 Understand how to interpret a frequency polygon</p> <p>C2 Understand the features of and how to construct a histogram with equal width classes</p> <p>C2 C3b Understand the correct method of frequency density to construct histograms with unequal width classes</p> <p>C2 Understand how to interpret histograms of equal and unequal width classes</p> <p style="text-align: center;">Review and revision</p> <p>C2 C3a C4b Look in detail at the types of data which can be used in the different types of diagram encountered so far, understand when various types of diagram can and cannot be used in terms of the nature of the data to be visualised</p> <p>C3b C1b Understand the misrepresentations that occur in visualisations, including those in media and the internet</p> <p>Part C Summary of different visualisation methods</p> <p>D1a E3a Understand the basic measures of average and their strengths and weaknesses</p> <p>D1a Understand how to find the mode or modal group and how to compare two data sets through the</p>
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		national sources of data including the Office for National Statistics and government					comparison of their modes (in context) D1a Understand how to calculate the mean for a set of data and a discrete frequency distribution
	Links to the national curriculum	N/A	N/A	N/A	N/A	N/A	N/A
	Previous content that this topic builds upon						
	Key vocabulary						
	Development of cultural capital						
	Development of reading	Edexcel GCSE (9 –1) Statistics Pg. 5 (Collection of data)	Edexcel GCSE (9 –1) Statistics Pg. 43 (Hypothesis)	Edexcel GCSE (9 –1) Statistics Pg. 24 (Non-random sampling)	Edexcel GCSE (9 –1) Statistics Pg. 57 (Tables)	Edexcel GCSE (9 –1) Statistics Pg. 285 (Venn Diagrams)	Edexcel GCSE (9 –1) Statistics Pg.98 (Frequency charts)
	Concepts –what will students be able to do at the end of the topic	Students should be able to understand and provided a hypothesis to a given scenario. They should also be able to use varies types to data learned to prove the validity of the hypothesis.	Students should be able to understand and discuss strategies to improve response rates to questionnaires and surveys make decisions.	Students should be able to understand the different types of sampling from the specification in an outline way.	Students should be able to understand how to tally and tabulate data including the use of different labelling systems.	Students should be able to understand how to interpret and compare data sets shown in population pyramids.	Students should be able to understand the features of and how to construct a histogram with equal width classes.
<b>Year Group</b>		<b>Autumn Term 1</b>	<b>Autumn Term 2</b>	<b>Spring Term 1</b>	<b>Spring Term 2</b>	<b>Summer Term 1</b>	<b>Summer Term 2</b>
<b>Year 10</b>	<b>Topic</b>	<b>The collection of data</b>	<b>Population and sampling</b>	<b>Processing and analysing data</b>	<b>Representing data</b>	<b>Measures of central tendency</b>	<b>Scatter diagrams and correlation</b>
	<b>Core knowledge from this topic</b>	1. The collection of data 1(a) Planning <ul style="list-style-type: none"> <li>• Hypotheses</li> <li>• Designing investigations</li> <li>• Strategies to deal with potential problems</li> </ul> 1(b) Types of data <ul style="list-style-type: none"> <li>• Describing data               <ul style="list-style-type: none"> <li>○ Raw data, quantitative, qualitative, categorical, ordinal, discrete, continuous, ungrouped, grouped,</li> </ul> </li> </ul>	1(c) Population and sampling <ul style="list-style-type: none"> <li>• Random, systematic and quota sampling</li> <li>○ Advantages of each method</li> <li>○ Techniques to avoid bias</li> <li>• Stratified sampling</li> </ul> 2(h) Estimation <ul style="list-style-type: none"> <li>• Use summary statistics to make estimates of population characteristics</li> <li>• Use sample data to predict population proportions</li> </ul>	2. Processing, representing and analysing data 2(a) Tabulation <ul style="list-style-type: none"> <li>• Tally, tabulation, two-way tables</li> <li>• Frequency tables</li> </ul> 2(a) Representing data <ul style="list-style-type: none"> <li>• Pictogram</li> <li>• Pie chart</li> <li>• Bar charts</li> <li>• Stem and leaf diagram</li> <li>• Population pyramid</li> <li>• Choropleth map</li> <li>• <b>Comparative pie chart</b></li> </ul>	2(a) Representing data <ul style="list-style-type: none"> <li>• <b>Histograms unequal class widths</b> <ul style="list-style-type: none"> <li>○ <b>Frequency density</b></li> <li>○ <b>Interpret and compare data sets displayed in histograms</b></li> </ul> </li> </ul> 2(a) Representing data <ul style="list-style-type: none"> <li>• Justify appropriate form to represent data</li> <li>• Graphical misrepresentation</li> <li>• Determine skewness by inspection</li> </ul>	2(b) Measures of central tendency <ul style="list-style-type: none"> <li>• Averages from raw or grouped data               <ul style="list-style-type: none"> <li>○ Mean, median, mode</li> </ul> </li> <li>• <b>Weighted mean</b></li> <li>• <b>Geometric mean</b></li> <li>• Justify appropriate average to use in context</li> </ul> 2(c) Measures of dispersion <ul style="list-style-type: none"> <li>• Range, quartiles, interquartile range (IQR), percentiles</li> <li>• <b>Interpercentile range, interdecile range</b></li> <li>• <b>Standard deviation</b></li> </ul>	2(e) Scatter diagrams and correlation <ul style="list-style-type: none"> <li>• Explanatory (independent) variables and response (dependent) variables</li> <li>• Correlation               <ul style="list-style-type: none"> <li>○ Positive, negative, zero, weak, strong</li> <li>○ Distinction between correlation and causation</li> </ul> </li> <li>• Line of best fit               <ul style="list-style-type: none"> <li>○ <b>Using the regression</b></li> </ul> </li> </ul>



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	<p>bivariate and multivariate</p> <ul style="list-style-type: none"> <li>Advantages and implications of merging/grouping data</li> <li>Primary/secondary data <ul style="list-style-type: none"> <li>Advantages and disadvantages</li> </ul> </li> </ul> <p>1(c) Population and sampling</p> <ul style="list-style-type: none"> <li>Population, sample frame and sample</li> <li>Judgment, opportunity (convenience) and quota sampling</li> </ul>	<ul style="list-style-type: none"> <li>Know that sample size has an impact on reliability and replication</li> <li><b>Apply Petersen capture recapture formula to calculate an estimate of the size of a population</b></li> </ul> <p>1(d) Collecting data</p> <ul style="list-style-type: none"> <li>Collection of data <ul style="list-style-type: none"> <li>Experimental (laboratory, field and natural), simulation, questionnaires, observation, reference, census, population and sampling</li> <li>Reliability and validity</li> <li>Collecting sensitive content matter</li> <li><b>Random response</b></li> </ul> </li> <li>Questionnaires and interviews <ul style="list-style-type: none"> <li>Leading questions, avoiding biased sources, time factors, open/closed questions, different types of interview technique</li> </ul> </li> <li>Problems with collected data <ul style="list-style-type: none"> <li>Missing data, non-response, 'cleaning' data</li> </ul> </li> <li>Controlling extraneous variables</li> </ul> <p><b>Control groups</b></p>	<ul style="list-style-type: none"> <li><b>Comparative 2D representations/comparative 3D representations.</b></li> <li>Interpret and compare data sets represented pictorially</li> <li>Line graphs</li> <li>Bar line (vertical line) charts</li> <li>Frequency polygons</li> <li>Cumulative frequency (discrete and grouped) charts</li> <li>Histograms (equal class width)</li> <li>Box plots</li> </ul> <p>Interpret and compare data sets represented graphically</p>	<ul style="list-style-type: none"> <li>Interpreting a distribution of data with reference to skewness</li> <li><b>Calculating skewness</b></li> </ul> <p>Comparing data sets represented in different formats</p>	<ul style="list-style-type: none"> <li>Identifying outliers by inspection</li> <li><b>Identifying outliers by calculation</b></li> <li>Comment on outliers in context</li> </ul> <p>Compare data sets using appropriate measure of central tendency and measure of dispersion</p>	<p><b>equation <math>y = a + bx</math></b></p> <ul style="list-style-type: none"> <li><b>Calculate Spearman's rank correlation coefficient</b></li> <li>Interpret Spearman's rank in context</li> <li><b>Interpret Pearson's product moment correlation coefficient (PMCC) in context</b></li> </ul> <p><b>Understand the distinction between Spearman's rank correlation coefficient and Pearson's product moment correlation coefficient (PMCC)</b></p>
Links to the national curriculum (if applicable)	N/A	N/A	N/A	N/A	N/A	N/A





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	<b>Previous content that this topic builds upon</b>	How to construct compound sentences					
	<b>Key vocabulary</b>						
	<b>Development of cultural capital</b>						
	<b>Development of reading</b>	Edexcel GCSE (9 –1) <b>Statistics Pg. 14 ( Collection of data and investigation)</b>	Edexcel GCSE (9-1) <b>Statistics Pg. 17 (Populations) with case studies.</b>	Edexcel GCSE (9 –1) <b>Statistics Pg. 103 ( The shape of distribution)</b>	Edexcel GCSE (9 –1) <b>Statistics Pg.107 ( Histograms with unequal class widths)</b>	Edexcel GCSE (9 –1) <b>Statistics Pg. 161 ( Measure of dispersion )</b>	Edexcel GCSE (9 –1) <b>Statistics Pg.207-210 (Scatter graphs and correlations)</b>
	<b>Concepts –what will students be able to do at the end of the topic</b>	Students should be able to understand the difference between a census and a sample, possibly referencing the National Census as an example.	Students should be able to understand how to apply Petersen capture recapture formula to calculate an estimate of the size of a population.	Students should be able to understand how to develop Comparative pie chart	Students should be able to understand use and create Histograms with unequal class widths.	Students should be able to understand and work out the Range, quartiles, interquartile range (IQR), percentiles.	Students should be able to understand on how to calculate the Calculate Spearman’s rank correlation coefficient.
<b>Year Group</b>		<b>Autumn Term 1</b>	<b>Autumn Term 2</b>	<b>Spring Term 1</b>	<b>Spring Term 2</b>	<b>Summer Term 1</b>	<b>Summer Term 2</b>
<b>Year 11</b>	<b>Topic</b>	<b>Time series and Venn Diagrams</b>	<b>Experimental and theoretical probability</b>	<b>Probability distributions</b>	<b>Statistical Enquiry Cycle</b>	<b>Revision</b>	<b>Revision</b>
	<b>Core knowledge from this topic</b>	2(f) Time series <ul style="list-style-type: none"> <li>Moving averages</li> <li>Identifying trends</li> <li>Interpreting seasonal and cyclical trends in context</li> <li>Mean seasonal variation               <ul style="list-style-type: none"> <li>Predictions using average seasonal effect</li> </ul> </li> </ul> 3. Probability 3. Experimental and theoretical probability <ul style="list-style-type: none"> <li>Likelihood</li> <li>Expected frequency of a specified characteristic within a sample or population</li> <li>Use collected data and calculated probabilities to determine and interpret risk</li> <li>Compare experimental data with theoretical predictions</li> </ul>	3. Experimental and theoretical probability <ul style="list-style-type: none"> <li>Independent events</li> <li>Conditional probability</li> <li>Difference in terms of bias</li> </ul> 2. Processing, representing and analysing data 2(d) Further summary statistics <ul style="list-style-type: none"> <li>Index numbers / weighted index numbers               <ul style="list-style-type: none"> <li>Retail price index (RPI)</li> <li>Consumer price index (CPI)</li> <li>Gross domestic product (GDP)</li> </ul> </li> <li>Interpret data related to rates of change over time when given in graphical form</li> <li>Calculate and interpret rates of change over time from tables using context specific formula</li> </ul>	3. Probability distributions <ul style="list-style-type: none"> <li>Binomial distribution               <ul style="list-style-type: none"> <li>Notation <math>B(n, p)</math></li> <li>Conditions that make binomial model suitable</li> <li>Mean <math>(np)</math></li> <li>Calculation of binomial probabilities</li> </ul> </li> <li>Normal distribution               <ul style="list-style-type: none"> <li>Notation <math>N(\mu, \sigma^2)</math></li> <li>Characteristics of Normal distribution</li> <li>Conditions that make Normal model suitable</li> <li>Approximately 95% of the data lie</li> </ul> </li> </ul>	Statistical Enquiry Cycle/A03 Practice Mini-investigation Use this time to carry out an investigation. Students should have the opportunity to work with real world data sets. They may choose to investigate a problem from the sciences, geography, business, economics or other relevant field. Students should: <ul style="list-style-type: none"> <li>Define a hypothesis to be investigated</li> <li>Decide data to collect</li> <li>Plan a strategy on how to process and represent data</li> <li>Generate diagrams to represent data</li> <li>Generate statistical measures</li> <li>Analyse diagrams and calculations</li> </ul>	A Revision - Understand the importance of the careful planning of a clear strategy for collecting, recording and processing data in order to address an identified question or hypothesis  B Revision - Recognise the opportunities, constraints and implications for subsequent mathematical analysis involved in obtaining appropriate data through careful design of primary data collection techniques or through the use of reference sources for secondary data to ensure unbiased research.  C Revision - Recognise the opportunities, constraints and implications for subsequent mathematical analysis involved in obtaining appropriate data through careful design of primary data collection techniques or through the use of reference	D Revision - Calculate statistical measures to compare data.  E Revision - Use visualisation and calculation to interpret results with reference to the context of the problem, and to evaluate the validity and reliability of statistical findings.  Bespoke revision reflecting the classes needs



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	<ul style="list-style-type: none"> <li>Understand that increasing sample size generally leads to better estimates of probability and population parameters</li> <li>Use two-way tables, sample space diagrams, tree diagrams and Venn diagrams to represent all the different outcomes possible for at most three events</li> </ul>		<p>within two standard deviations of the mean and that 68% (just over two thirds) lie within one standard deviation of the mean</p> <p>2(c) Measures of dispersion</p> <ul style="list-style-type: none"> <li>Standardised scores</li> </ul> <p>2(g) Quality assurance</p> <ul style="list-style-type: none"> <li>Know that a set of sample means are more closely distributed than individual values from the same population.</li> <li>Control charts</li> </ul> <p>Use action and warning lines in quality assurance sampling applications.</p>	<ul style="list-style-type: none"> <li>Draw conclusions relating to hypotheses               <ul style="list-style-type: none"> <li>Discuss reliability</li> <li>Identify weaknesses</li> <li>Suggest improvements</li> </ul> </li> </ul>	sources for secondary data to ensure unbiased research	
Links to the national curriculum (if applicable)	NA	NA	NA	NA	NA	NA
Previous content that this topic builds upon						
Key vocabulary						
Development of cultural capital						
Development of reading	Edexcel GCSE (9 –1) Statistics Pg.250 ( Variations of time series)	Edexcel GCSE (9 –1) Statistics Pg. 290 ( Mutually exclusive and exhaustive probability)	Edexcel GCSE (9 –1) Statistics Pg. 343 (Binominal Distributions)	Edexcel GCSE (9 –1) Statistics Pg. 371 (Thinking statistically)		
Concepts –what will students be able to do at the end of the topic	Students should be able to understand why there is the need to compare experimental data with theoretical predictions.	Students should be able to understand processing, representing and analysing data.	Students should be able to understand attempt the Binominal distribution questions.	Students should be able to understand and apply the Statistical Enquiry Cycle.	Students will be given a chance to revisit topics that were challenging.	Students should be able to understand focus on exam based questions and given the opportunity practise exam skills.