

Year one

Term one

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
1	3.6.1 to 3.6.5	Statistical Enquiry Cycle (SEC) – to become familiar with the steps required to carry out a sound statistical investigation	3	If appropriate it would be helpful to reference KS3 statistical investigations carried out in maths and inspect them for adherence to the SEC	
2	3.1.1 A1 3.1.2 A2	Understand what a hypothesis is and how it might be tested Understand factors that may constrain how an investigation is carried out and how a hypothesis might be tested	1		
2	3.1.3 A3	Understand the necessary and preferably proactive strategies that might be necessary to avoid the issues raised above when undertaking an investigation	1		

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
2/3	3.2.1 B1a 3.2.4 B2a	<p>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 (eg which diagram to use)</p> <p>Understand the potential dangers of using secondary data</p>	2		S2, S3h, S4
3	3.2.3 B1c	Understand the terms 'explanatory' / 'response' and 'dependent' / 'independent' (through use of examples)	1		P8
3	3.2.5 B2b	Understand the difference between a census and a sample, possibly referencing the National Census as an example	1		

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
4	3.2.5 B2b 3.5.4 E2a	Understand different types of experiments and observation including the implications for level of control Understand that comparing outcomes with predictions can be used to identify possible bias in the design	1		
4	3.2.5 B2b 3.5.10 E3d	Understand how to reference and interpret secondary sources – working online if possible to interrogate well known national sources of data including the Office for National Statistics and government	1		
4/5	3.2.5 B2b 3.2.14 B4 3.2.7 B2d	Understand how to write and evaluate a questionnaire, including considerations in B4, avoiding bias and dealing with sensitive issues	2		
5	3.2.5 B2b	Understand the use of simulations to obtain data and information	1		
5	3.2.6 B2c	Understand validity and reliability as detailed in B2c	1		

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
6	3.2.5 B2b	Summary lesson – understand the relative benefits of the different methods of data collection recently considered	1		
6	-	Assessment on work done so far	1		
6	3.2.8 B3a 3.2.9 B3b	Understand what a population is in different circumstances, the use of sample frames and sampling in general	1		S1
7	3.2.10 B3c 3.2.11 B3d	Understand the different types of sampling from the specification in an outline way	1		
7	3.2.10 B3c	Understand the reasons for use of and dangers of convenience sampling	1		
7/8	3.2.11 B3d and 3.2.12 B3e	Understand the concept of random sampling and how to carry it out using the different methods listed in the specification	2		
8	3.2.11 B3d	Understand the concept of and how to carry out a systematic sample	1		
8	3.2.11 B3d	Understand the concept of and how to carry out a quota sample	1		

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
9	3.2.13 B3f	Understand the concept of stratification and the necessary calculations and rounding issues that may arise	2	Calculating with percentages and fractions (N2)	
9/10	3.2.15 B5a	Understand how to deal with issues that arise with collected data including sessions on internet collected data	2		
10	3.2.16 B5b	Understand the possible need to clean data including on spreadsheets and the techniques required	1		
10	3.2.17 B5c	Understand extraneous variables, how to identify and control them	1		
11	-	Review of methods for data selection and collection	1		
11	3.3.1 C1a and 3.2.2 B1b	Understand how to tally and tabulate data including the use of different labelling systems Understand the implications of merging classes for continuous data	2	Use of double inequalities for 'between' two values such as $0 \leq t \leq 10$ (N1)	S2, S3h
12	3.3.1 C1a	Understand the use and misuse of pictograms	1		S2

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
12	3.3.1 C1a	Understand how to draw a standard pie chart	1	How to use a protractor (G2) Use of angle and fraction calculations	S2
12	3.3.1 C1a	Understand how to interpret pie charts already drawn or generated by the student	1		S2
13	3.3.2 C1b	Understand how to construct a comparative pie chart for two data sets	1	Knowledge of area of a circle formula and calculations (G17)	
13	3.3.2 C1b	Understand how to interpret and work with comparative pie charts and other 3D visualisation methods (eg from the media)	1	Knowledge of area of a circle formula and calculations (G17)	
13	3.3.1 C1a	Understand how to draw a stem-and-leaf diagram including the importance of a key	1		
14	3.3.1 C1a	Understand how to draw a back-to-back stem-and-leaf diagram including the importance of a key	1		

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
14	3.3.1 C1a	Understand how to interpret stem-and-leaf and back-to-back stem-and-leaf diagrams (excluding median and IQR which comes later as a refresher for these diagrams)	1		
14	3.3.1 C1a	Understand how to interpret Venn diagram (excluding their use for probability which comes later as a refresher for these diagrams)	1		P6
15	3.3.1 C1a	Understand how to draw Venn diagrams from information given	1		P6
15	3.3.1 C1a 3.3.7 C4b	Understand the types of data for which the diagrams covered so far are suitable	1		S2, S3h
15	-	Second assessment on work done so far	1		

Term two

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
1	3.3.2 C1b	Understand how to interpret choropleth maps	1		
1	3.3.2 C1b	Understand how to interpret and compare data sets shown in population pyramids	1		
1	3.3.3 C2	Understand how to draw and interpret a basic bar chart and bar line chart	1		S2
2	3.3.3 C2	Understand how to draw and interpret dual and composite bar charts	1		
2	3.3.3 C2	Understand how to draw and interpret percentage bar charts	1		
2	3.3.3 C2	Understand how to draw and interpret line charts	1		S2
3	3.3.3 C2	A basic understanding of time series and scatter charts (both to be covered in more detail later)	1		S2, S6
3	3.3.3 C2	Understand how to draw a frequency polygon	1		

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
3	3.3.3 C2	Understand how to interpret a frequency polygon	1		
4	3.3.3 C2	Understand the features of and how to construct a histogram with equal width classes	1		S3h
4	3.3.3 C2 3.3.5 C3b	Understand the correct method of frequency density to construct histograms with unequal width classes	2	Area of a rectangle (G16)	S3h
5	3.3.3 C2	Understand how to interpret histograms of equal and unequal width classes	1		S3h
5	3.3.3 C2 3.3.4 C3a 3.3.7 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	2		S2, S3, S4h
6	3.3.5 C3b 3.3.2 C1b	Understand the misrepresentations that occur in visualisations, including those in media and the internet	3 [suggested project for one week]		

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
7	All of section C	Summary of different visualisation methods including assessment	3		
8	3.4.1 D1a 3.4.2 D1b	Understand the basic measures of average and their strengths and weaknesses	1		S4
8	3.4.1 D1a 3.5.7 E3a	Understand how to find the mode or modal group and how to compare two data sets through the comparison of their modes (in context)	1		S4
8	3.4.1 D1a	Understand how to calculate the mean for a set of data and a discrete frequency distribution	1		S4
9	3.4.1 D1a	Understand how to calculate an estimate of the mean for a grouped frequency distribution including why it is an estimate	1		S4
9	3.4.1 D1a 3.4.2 D1b	Understand how to calculate a geometric mean and the circumstances in which this is a better measure than arithmetic mean	1		
9	3.5.7 E3a	Comparing two data sets through the comparison of their means (in context)	1		S5

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
10	3.4.1 D1a 3.5.7 E3a	Understand how to calculate the median for a set of data and how to compare two data sets through the comparison of their medians (in context)	1		S4, S5
10	3.4.1 D1a	Understand how to identify the median for tabulated discrete data	1		S4
10	3.4.1 D1a	Understand how to estimate the median for a grouped frequency distribution (calculation methods)	1		S4
11	3.4.1 D1a	Understand the concept of a weighted mean and how it is calculated	2		
11	3.4.3 D2	Understand the basic concept of a symmetric distribution and of skew by inspection	1		
12	3.4.3 D2	Understand how to calculate skew from a given formula	1		
12	3.5.13 E5a	Understand how to interpret the skewness of a distribution or compare the skewness of two distributions from inspection or from calculation	1		

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
12	-	Summary of measures encountered so far, optional assessment	1		

Term three

Time within this term has been allocated to summer exams and other possible events, such as work experience, by reducing the teaching load to 10 weeks between Easter and summer.

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
1	3.4.4 D3a	Understand the concept of (measures of) spread and the most basic of those, the range	1		S4
1	3.4.4 D3a	Understand what quartiles are from a list of values and the concept of inter-quartile range	1		S4h
1	3.4.4 D3a	Understand what deciles and percentiles are and the concept of inter-percentile and inter-decile range	1		
2	3.3.3 C2	Understand the concept of cumulative frequency and how to find cumulative frequencies for a grouped or discrete frequency distribution	1		S3h
2	3.3.3 C2	Understand how to construct a cumulative frequency graph for a grouped frequency distribution	2		S3h

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
3	3.3.3 C2	Understand how to construct a cumulative frequency step polygon for a discrete frequency distribution	2		
3/4	3.3.3 C2 3.4.1 D1a 3.4.4 D3a	Understand how to obtain estimates of median and inter-quartile range from different cumulative frequency graphs and comparing the results in context	2		S4h
4	3.3.3 C2 3.4.4 D3a	Understand how to obtain estimates of inter-decile range and inter-percentile range from different cumulative frequency graphs and comparing the results in context	1		
4	3.4.4 D3a	Understand the concept of standard deviation and what it is measuring	1		
5	3.4.4 D3a	Understand how to calculate standard deviation for a list of values	1		
5	3.4.4 D3a 3.4.1 D1a	Understand how to calculate standard deviation (and mean) using Sigma notation and frequency tables	2		

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
6	3.4.5 D3b	Understand the concept of outliers and looking for them by inspection	1		S4, S6
6	3.3.3 C2	Understand how to construct a box plot	1		S4h
6	3.3.3 C2 and 3.4.5 D3b	Understand the construction of a box plot with statistical outliers included (of the LQ $-1.5IQR$ and UQ $+1.5IQR$ type)	1		
7	3.4.5 D3b	An understanding of outliers for the mean and standard deviation method	1		
7	3.5.14 E5b	Understand how to comment on outliers with reference to the original data	1		
7	SEC 3.6	Revisit the Statistical Enquiry Cycle and discuss in light of content now covered	1		
8 or 9	All specification references so far	Revision of material in Year 10	3		
9 or 8	All specification references so far	Suggested statistical investigation (the previous specification's Controlled Assessment is a good source)	3		

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
10	All specification references so far	End of Year assessments, review and feedback	3		

Year two

Term one

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
1	3.3.6 C4a 3.3.7 C4b	Understand and review the different types of presentations and visualisations for data including comparisons Focus on the type of data and consequent choices for the type of diagram which can be used	2		S2, S3, S4
1/2	3.4.2 D1b 3.5.7 E3a 3.5.8 E3b	Understand and review the different types of measures of average and spread Focus on the context and type of data with the consequent choice of measure used	2		S4
2	3.3.3 C2 3.4.6 D4	Review of time series graphs and understand the basic notion of trends over time and within a cycle gleaned by inspection	1		S2

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
2/3	3.4.6 D4	Understand the common scenarios where four-point moving averages are useful and why Understand how to plot four-point moving averages and join with line of best fit by eye to see trend	2		
3	3.4.6 D4	Understand how to determine appropriate point moving averages according to the context, their plotting and interpretation	1		
3	3.5.15 E6	Understand how to interpret seasonal and cyclic trends in context	1		
4	3.5.15 E6	Understand how to use identified trends to make predictions about the future values in a time series	1		S2
4	3.4.1 D1a 3.5.15 E6	Understand how to calculate and use mean seasonal variation in prediction about the future values in a time series	1		
4	3.3.3 C2 3.4.7 D5	Review of scatter diagrams including determining the line of best fit by eye	1		S6

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
5	3.4.7 D5	Understand the technique of determining a line of best fit using the plotted double mean	1		
5	3.4.7 D5	Understand the technique of determining (and plotting) the equation of the regression line	2	Understand $y = mx + c$, including the plotting of such lines (A10)	
6	3.5.19 E8a	Understand the meaning of the terms 'interpolation' and 'extrapolation' and their relative reliability.	1		S6
6	3.5.19 E8a 3.5.20 E8b	Understand all the vocabulary surrounding correlation for type and strength	1		S6
6	3.5.21 E8c	Understand that correlation does not necessarily imply causation and that other factors may or will interact	1		S6
7	3.5.19 E8b 3.5.22 E9a	Understand the Spearman's -1 to $+1$ scale to strength of correlation as outlined in the specification and interpreting results in context	1		

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
7	3.4.8 D6 3.5.22 E9a	Understand how to calculate Spearman's correlation coefficient using the formula (or by calculator as this is acceptable in assessments)	1		
7	3.5.23 E9b 3.5.24 E9c	Understand that there are other ways of measuring correlation (namely Pearson's product moment correlation coefficient) and be able to interpret on the -1 to $+1$ scale	1		
8	3.5.24 E9c	Understand how Pearson's and Spearman's methods compare	1		
8	3.5.16 E7a	Understand how to interpret data that relates to 'rates of change' over time eg birth rates	1		R15h
8	3.5.17 E7b	Understand how to calculate rates of change using given formulae and interpret the results	1		R15h
9	3.5.18 E7c	Understand the different common index numbers that occur as detailed in specification, including but not limited to, retail price index, consumer price index and gross domestic product	1		

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
9	3.5.18 E7c	Understand how to calculate and interpret weighted index numbers	2		
10	All previous work this term	Review and assessment	2		
10	3.5.1 E1a	Understand the scales that are used to work with probability (fractions, decimals and percentages)	1	Fractions, decimals and percentages (N1)	P3
11	3.5.6 E2c	Understand the concept of a sample space diagram and how to complete one	1		P7
11/12	3.5.1 E1a 3.4.9 D7	Understand how to calculate probabilities for equally likely outcomes in contexts of one and two events including use of sample spaces	3		P7
12	3.5.11 E4a	Understand the concept of independent events and relevant notation	1		P8
12/13	3.5.11 E4a	Understand how to calculate probabilities involving independent events and how to use probabilities to determine if events are independent	2		P8

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
13	3.5.12 E4b	Understand the concept of conditional probability and relevant notation	1		P9h
13	3.5.12 E4b	Understand how to calculate probabilities conditional on other events having occurred	1		P9h
14	3.3.1 C1a	Understand how to construct a two-way table from given information	1		P7
14	3.5.6 E2c	Understand how to use a two-way table to calculate basic probabilities (not conditional)	1		P8
14	3.5.6 E2c	Understand how to use a two-way table to calculate conditional probabilities	1		P9h
15	3.5.6 E2c	Understand how to use a Venn diagram to calculate basic probabilities (not conditional)	1		P6
15	3.5.6 E2c	Understand how to use a Venn diagram to calculate conditional probabilities	1		P9h
15	-	Overview of learning so far	1		

Term two

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
1	3.5.6 E2c	Understand how to construct a tree diagram for a given context	1		P7, P8
1	3.5.6 E2c	Understand how to use a tree diagram to calculate probabilities in 'with replacement' (independent) situations	2		P8, P9h
2	3.5.6 E2c	Understand how to use a tree diagram to calculate probabilities in 'without replacement' (dependent / conditional) situations	2		P8, P9h
2	3.5.2 E1b	Understand how probability values can be used to find expected frequencies	1		
3	3.5.3 E1c	Understand the concept of risk as probabilities which can be compared	1		

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
3	3.5.2 E1b 3.5.3 E1c	Understand that risk probabilities can be used to generate frequencies of outcomes for characteristics within a population either on their own or as comparisons	2		
4	3.5.5 E2b	Understand that increasing trials improves the proximity of experimental probability (relative frequency) to theoretical probability	1	Ability to compare fractions or decimals (N1)	P5
4	3.5.25 E10a	Understand how to comment on differences between experimental and theoretical values in an experiment in the context of possible bias	1		
4	All probability and related work	Review of work done on probability	1		
5	All probability and related work	Optional assessment on probability	1		
5	3.5.26 E10b	Understand the basic conditions for a binomial distribution to be valid and the features of the distribution	1		

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
5/6	3.5.26 E10b	Understand the method of calculating probabilities for a binomial situation for n up to and including 5 (using formula if desired)	2		
6	3.5.27 E11a	Understand the general features of a Normal distribution and its common place in real data	1		
6	3.5.28 E11b	Understand the specific features of a Normal distribution relating to probabilities of being specific numbers of standard deviations from the mean	1		
7	3.5.27 E11a 3.5.28 E11b	Understand how to sketch one or more Normal distributions showing the key features they exhibit	1		
7	3.5.30 E11d	Understand the concept of how to standardise using the mean and standard deviation as a method of comparing Normal samples	1		
7	3.5.30 E11d	Understand how to work with given or calculated standardised scores to make comparisons	1		

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
8	3.5.29 E11c	Understand the concept of quality assurance and the charts used (mean, median and range)	1		
8	3.5.29 E11c	Understand how to use warning and action line for quality assurance sampling applications (mean, median and range)	2		
9	All of E12 and E13	Understand the concept of using samples to estimate values in a population	1		S1
9	3.5.31 E12a	Understand how to use summary data to make estimates of population characteristics	1		S4, S5
9/10	3.4.1 D1a 3.5.32 E12b	Understand how to use samples to estimate a population mean. Revise all aspects of obtaining measures of average from lists, tables and diagrams	4		S4, S5
11	3.5.33 E12c	Understand how to use sample data to estimate the proportion of a characteristic in a population	1		

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
11	3.5.34 E12d	Understand the concept and assumptions being made during the implementation of the Petersen capture-recapture technique	1		
11	3.5.34 E12d	Understand how to calculate population estimates using the Petersen capture-recapture technique	1		
12	3.5.35 E13a 3.2.6 B2c	Understand the impact of sample size on issues such as reliability and replication	1		
12	3.5.36 E13b	Understand at a basic level the notion that a set of sample means will be more closely distributed than individual values from the same population	1		
12	-	Assessment	1		

Term three

Week number	Specification reference	Learning objective(s)	Suggested timing (hours)	Prerequisite knowledge	Links to GCSE Maths 8300
1	3.3.6 C4a 3.5.7 E3a 3.5.8 E3b 3.5.9 E3c	Review the comparison of different samples, or a sample and a population, to include the comparison of a measure of location and the comparison of a measure of spread, concluding in the context that the data is within	3		
2/3	3.3.7 C4b	Review the selection of appropriate forms of diagrammatic representation based on the nature of the data (review of all visualisations in this context of data types)	3–6		S2, S3, S4, S6
4 onwards as time allows	-	Other revision and past papers (eg specimen and practice papers) according to the needs of the students			