


YEAR 10, HIGHER 3 YEAR GCSE, STATISTICS, MATHS

Rationale and Context of Unit:	Core curriculum content:	Tier 2 & Tier 3 vocabulary explicitly taught:
<p><u>COLLECTING AND REPRESENTING DATA</u></p> <ul style="list-style-type: none"> • Interpret and construct tables, charts and diagrams including, for categorical data: • frequency tables • bar charts • pie charts • pictograms • vertical line charts for ungrouped discrete numerical data • tables and line graphs for time series data • know their appropriate use • Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate graphical representation involving discrete, continuous and grouped data • Construct and interpret diagrams for grouped discrete and continuous data, i.e. histograms and cumulative frequency graphs, and know their appropriate use. 	<p><u>STATISTICAL MEASURES</u></p> <ul style="list-style-type: none"> • Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through: • appropriate measures of central tendency (median, mean, mode and modal class) • spread (range, including consideration of outliers, quartiles and inter-quartile range) • Apply statistics to describe a population • Infer properties of populations or distributions from a sample, whilst knowing the limitations of sampling <p><u>STATISTICS RECAP AND REVIEW</u></p> <ul style="list-style-type: none"> • Construct and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with equal and unequal class intervals and cumulative frequency graphs, and know their appropriate use • Interpret, analyse and compare distributions of data sets from univariate empirical distributions through appropriate graphical 	<p>Data, primary data, secondary data, discrete data, continuous data, Average, mean, mode, median, range, upper quartile, lower quartile, inter-quartile range, maximum, minimum, sampling, statistics, histograms, cumulative frequency diagrams, box plots, compare, populations</p> <p>Highlighted words <u>MUST</u> be explicitly taught, defined and recorded in student books as they are first met. Other listed words may be introduced verbally or written in a similar format.</p>

<p><u>SCATTER GRAPHS</u></p> <ul style="list-style-type: none"> • Use and interpret scatter graphs of bivariate data • Recognise correlation and know that it does not indicate causation • Draw estimated lines of best fit • Make predictions • Interpolate and extrapolate apparent trends whilst knowing the dangers of doing so. 	<p>representation involving discrete, continuous and grouped data, including box plots</p> <ul style="list-style-type: none"> • interpret, analyse and compare the distributions of data sets from univariate empirical distributions through consideration of outliers, quartiles and inter-quartile range • Draw estimated lines of best fit • Make predictions • Interpolate and extrapolate apparent trends whilst knowing the dangers of doing so • Infer properties of populations or distributions from a sample, whilst knowing the limitations of sampling 	
<p>Challenge and Support:</p>	<p>World wide learning/ links to 21st century:</p>	<p>Cultural capital/ Industry/ Enrichment:</p>
<p>Statistics</p> <ol style="list-style-type: none"> 1. <u>infer properties of populations or distributions from a sample, whilst knowing the limitations of sampling</u> 2. interpret and construct tables, charts and diagrams, including frequency tables, bar charts, pie charts and pictograms for categorical data, vertical line charts for ungrouped discrete numerical data, <u>tables and line graphs</u> 	<ul style="list-style-type: none"> • Understanding the relationship between quantities helps us to make informed decisions on a global scale. Literacy problems will not be resolved effectively unless poverty is also tackled. 	<div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>Search Algebra for all ages</p> <p>NRICH website – access current articles and enrichment activities.</p> <ul style="list-style-type: none"> • NRICH provides thousands of free online mathematics resources for ages 3 to 18 - completely free and available </div> </div>

<p><u>for time series data</u> and know their appropriate use</p> <p>3. construct and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with equal and unequal class intervals and cumulative frequency graphs, and know their appropriate use</p> <p>4. interpret, analyse and compare the distributions of data sets from univariate empirical distributions through:</p> <ul style="list-style-type: none"> • appropriate graphical representation involving discrete, continuous and grouped data, including box plots • appropriate measures of central tendency (median, mean, mode and modal class) and spread (range, including consideration of outliers, quartiles and inter-quartile range) <p>5. apply statistics to describe a population</p> <p>6. use and interpret scatter graphs of bivariate data; recognise correlation and <u>know that it does not indicate</u></p>		<p>to all via their website (nrich.maths.org/). These resources aim to:</p> <ul style="list-style-type: none"> ○ Enrich and enhance the experience of the mathematics curriculum for all learners ○ Develop mathematical thinking and problem-solving skills ○ Offer challenging, inspiring and engaging activities <ul style="list-style-type: none"> ● Problem solving opportunities – Applied Mathematics. ● Challenge problems. ● Extension work. ● Assessment sections in texts
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<p><u>causation; draw estimated lines of best fit; make predictions; interpolate and extrapolate apparent trends whilst knowing the dangers of so doing</u></p>		
<p>Historical, Social, Moral, Spiritual, Cultural context:</p>	<p>Cross curricular links/ literacy/numeracy:</p>	<p>Common misconceptions:</p>
<ul style="list-style-type: none"> We live in an information rich world. Knowing how to construct accurate graphs and how to interpret data is important. Many graphs in newspapers are carefully designed to influence what we think by displaying the data in a particular way. Analysing large sets of data enables financial and insurance companies to make predictions about what might happen in the future. Young drivers have more accidents so their insurance costs more. 	<ul style="list-style-type: none"> Science: science can provide the context for many basic statistics problems such as: calculation of average speed, distance and time; predictions of bacteria growth rates and understanding key factors effecting a healthy population. Geography: statistics on populations in different parts of the world at different periods, given as percentages and represented in a variety of forms (for example: Pie Charts). Literacy: Interpretation of written problems with conversion between these types of problems to pictorial and number representation. Correct use of specialised vocabulary. 	<ul style="list-style-type: none"> Some pupils may think that the lines on a line graph are always meaningful Some pupils may think that each square on the grid used represents one unit Some pupils may confuse the fact that the sections of the pie chart total 100% and 360° Some pupils may not leave gaps between the bars of a bar chart If using a calculator some pupils may not use the '=' symbol (or brackets) correctly; e.g. working out the mean of 2, 3, 4 and 5 as $2 + 3 + 4 + 5 \div 4 = 10.25$. Some pupils may think that the range is a type of average Some pupils may think that a set of data with an even number of items has two values for the median, e.g. 2, 4, 5, 6, 7, 8 has a median of 5 and 6 rather than 5.5 Some pupils may not write the data in order before finding the median.



Assessment timeline:

- Topic test assessments are conducted at the end of each topic. These are roughly after 2 weeks per topic, but this may vary.
- Pre-checks are conducted at the start of the topic to test student prior knowledge. This informs lesson planning and delivery.
- Tracking assessments are conducted once a term with end of year formal exams, for reporting and checking cumulative knowledge.
- Testing data leads to discussions about setting, intervention groups and individual in-class intervention.
- All students have access to a wide range of resources to develop their understanding.

Home learning

- Homework is set weekly for each group. This will often be via interactive websites with immediate feedback and support.
- Teachers have the autonomy to use whichever resource they wish within the criteria set for the topic.
- Students have access to lots of resources at home, including: Kerboodle, MyMaths, Mathswatch, PiXL Maths APP, PiXL Tmes Table App.

Feedback

- Feedback is given after each topic test, tracking assessment and end of year exams. After tracking and end of year exams, this will include “Formative Marking” sheets which give feedback question by question to help support the students with priorities for further work.

Length of unit (duration indicated in lessons)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Unit:																													