



YEAR 12 Core Maths

'An ambitious curriculum that meets the needs of all'

Medium Term Planning – Probabilities and Estimation Unit

Curriculum Intent

Skills/Assessment Objective Links

	Content	Additional information
S4.1	understanding what is meant by the term 'population' in statistical terms	
S4.2	developing ideas of sampling to include the concept of a simple random sample from a population	
S5.1	knowing that the mean of a sample is called a 'point estimate' for the mean of the population	appreciating that accuracy is likely to be improved by increasing the sample size
S6.1	confidence intervals for the mean of a normally distributed population of known variance using $\frac{\sigma^2}{n}$	confidence intervals will always be symmetrical the confidence level required and the sample size will always be stated

Skills/Assessment Objective Links

Prior Knowledge

1. Basic Probability Concepts

Understanding:

Probability as a value between 0 and 1.

The difference between theoretical and experimental probability.

Basic probability rules:

$$P(A) + P(\text{not } A) = 1$$

Familiarity with:

Venn diagrams for representing events.

Frequency trees, tables, and basic sample spaces.

2. Describing and Summarising Data

Be able to:

Find and interpret the mean, median, mode and range.

Use grouped data to estimate the mean.

Understand basic ideas of data distribution.

3. Data Representation and Handling

Ability to:

Interpret bar charts, histograms, pie charts, and box plots.

Read and analyse tables and graphs showing data distributions.

Work with frequency tables and construct basic statistical diagrams.

4. Numerical and Algebraic Reasoning

Use and rearrange simple formulas.

Work with percentages, ratios, and proportions.

Apply multiplication, division, and rounding accurately.

Understand and use basic units and conversion (e.g. g to kg, cm to m).

Prior Knowledge

	<p>5. Sampling and Estimation Concepts (Introductory Level)</p> <p>Prior exposure to:</p> <p>Types of sampling methods (random, stratified, etc.)</p> <p>Concepts of bias and representativeness in data collection.</p>
Spiritual, moral, social, and cultural development	<p>Spiritual - Encourages reflection on uncertainty and the role of chance</p> <p>Moral - Explores bias, fairness, and responsible data use</p> <p>Social - Promotes teamwork and discussion of real-world impacts</p> <p>Cultural - Examines data use across societies and global issues</p>
Numeracy	<p>Fraction, decimal & percentage calculations - Calculating and interpreting probabilities</p> <p>Data handling & summarizing - Estimating averages, interpreting spread</p> <p>Approximation & rounding - Making and evaluating estimates</p> <p>Logical reasoning - Making predictions and assessing results</p> <p>Use of technology - Calculating probabilities and summarising data</p>
Literacy	<p>Vocabulary - Using precise probability and estimation terms</p> <p>Reading comprehension - Interpreting data and worded scenarios</p> <p>Written explanation - Justifying methods and interpreting results</p> <p>Critical evaluation - Assessing reliability and bias in data</p> <p>Communication - Presenting conclusions clearly in writing and speech</p>
Becoming future ready	<p>Data literacy - Understanding and using probability and estimates</p> <p>Critical thinking - Evaluating data quality and model limitations</p> <p>Communication - Explaining probabilistic and statistical information</p> <p>Digital skills - Using calculators and software for data analysis</p> <p>Real-world application - Applying maths in everyday and professional contexts</p> <p>Ethical awareness Recognising responsible use of data</p>
Adaptation QFT/SEND Provision	<ul style="list-style-type: none"> • By progressive questioning: exploring pupils' understanding through interactive dialogue. • By outcome: different learners will produce different outcomes. • By resource: worksheets are clearly presented and accessible. • By intervention: by providing different levels of supervision and support. • By grouping/setting: according to prior attainment, gender, social preference, preferred learning style. • By offering optional activities: In class or as homework, to extend learning.
Implementation	<p>1. Understand and Apply Basic Probability Concepts</p> <p>Understand probability as a value between 0 and 1.</p>

Curriculum Delivery	<p>Calculate probabilities for single and combined events.</p> <p>Use frequency and relative frequency to estimate probabilities.</p> <p>Apply the addition and multiplication rules of probability.</p>
Learning Outcomes (Knowledge)	<p>2. Represent and Interpret Probability Data</p> <p>Use and interpret probability scales, sample spaces, and frequency trees.</p> <p>Construct and interpret Venn diagrams to solve problems involving unions, intersections, and complements.</p> <p>3. Understand and Use Estimation Techniques</p> <p>Estimate population parameters from sample data.</p> <p>Use techniques such as:</p> <p>Grouped data to estimate the mean.</p> <p>Sampling methods and understand their impact on estimates.</p> <p>Recognise bias and variability in sampling and estimation.</p> <p>4. Apply Probability and Estimation in Context</p> <p>Use probability and estimation to make predictions and informed decisions in real-life contexts.</p> <p>Assess the reliability and limitations of probabilistic models and estimates.</p> <p>Distinguish between interpolation and extrapolation when using estimates.</p> <p>5. Communicate Reasoning and Results</p> <p>Explain methods, justify conclusions, and interpret results in everyday language.</p> <p>Critically evaluate the validity of conclusions based on probability and estimation.</p>
Assessment	Refer to Assessment Map – Final examination May/June End of Year 12
Impact	Attainment and Progress – Refer to assessment results / data review documentation.