



YEAR 12 Core Maths

'An ambitious curriculum that meets the needs of all'

Medium Term Planning – Estimation Unit

Curriculum Intent

Skills/Assessment Objective Links

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	Content
E1.1	representing a situation mathematically, making assumptions and simplifications
E1.2	selecting and using appropriate mathematical techniques for problems and situations
E1.3	interpreting results in the context of a given problem
E1.4	evaluating methods and solutions including how they may have been affected by assumptions made
	Content
E2.1	making fast, rough estimates of quantities which are either difficult or impossible to measure directly

Prior Knowledge

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1. Basic Numeracy Skills

- Arithmetic with whole numbers, decimals, and fractions
- Rounding numbers to significant figures and decimal places
- Understanding place value

2. Units and Measurement

- Familiarity with common units of measurement (e.g., cm, m, kg, litres)
- Converting between units (e.g., grams to kilograms, minutes to hours)
- Understanding and using compound units (e.g., speed = distance/time)

3. Basic Geometry

- Knowledge of formulas for area, perimeter, and volume of basic shapes:
 - Area of a rectangle, triangle, and circle
 - Volume of a cube, cuboid, cylinder, etc.

	<ul style="list-style-type: none"> • Being able to estimate measurements from diagrams or real-life contexts <p>4. Proportional Reasoning</p> <ul style="list-style-type: none"> • Working with ratios and proportions • Understanding scale and how it applies to diagrams or maps • Using percentage increase/decrease appropriately <p>5. Problem Solving and Reasoning</p> <ul style="list-style-type: none"> • Interpreting real-life problems and identifying relevant information • Making and justifying assumptions • Estimating and checking the reasonableness of answers <p>6. Use of a Calculator</p> <ul style="list-style-type: none"> • Using a calculator efficiently to check estimates or support reasoning • Understanding calculator output and interpreting results sensibly <p><u>Learning further developed in the future</u></p> <ul style="list-style-type: none"> - Preliminary Material Fermi Estimation Question
<p>Spiritual, moral, social, and cultural development</p>	<p>Spiritual Development</p> <ul style="list-style-type: none"> • Encourages reflective thinking when making assumptions or evaluating the plausibility of estimates. • Develops a sense of awe and wonder about how maths applies to real-world scenarios, such as estimating global population impacts, resource usage, or environmental issues. <p>Moral Development</p> <ul style="list-style-type: none"> • Involves ethical considerations when making estimations that may affect people's lives, such as: <ul style="list-style-type: none"> ◦ Estimating medical needs (e.g. number of vaccines required) ◦ Costs of public services ◦ Estimating risks (e.g. flood risk or accident probabilities) • Encourages students to think about the consequences of inaccurate estimations in real-life professions like engineering, finance, and healthcare. <p>Social Development</p> <ul style="list-style-type: none"> • Promotes collaboration and discussion when working in groups to solve estimation problems. • Supports teamwork and communication skills, especially when debating assumptions or reasoning.

	<ul style="list-style-type: none"> Links to real-world social issues, such as budgeting, housing, or transport, which are relatable and encourage practical engagement. <p>Cultural Development</p> <ul style="list-style-type: none"> Builds understanding of how maths (and estimation) is used in different cultures and countries, for example: <ul style="list-style-type: none"> Comparing energy usage per household globally Estimating population density or food consumption across nations Promotes appreciation of diversity through context-based problems that reflect global challenges.
Numeracy	Rounding - Simplifying complex calculations Arithmetic - Estimating using mental maths Units & Measures - Estimating quantities, conversions, and scales Geometry - Estimating shape measurements Proportional Reasoning - Scaling and comparisons Real-Life Maths - Budgeting, travel planning
Literacy	Reading comprehension - Interpreting written contexts (e.g., travel, budgeting) Clear written expression - Explaining how an estimate was made Technical vocabulary - Using correct mathematical terms (e.g., "significant figure") Justifying opinions - Explaining why one estimate is more reasonable than another Structured reasoning - Writing step-by-step solutions
Becoming future ready	Practical numeracy - Everyday life, budgeting, independent living Workplace readiness - Decision-making, estimation under uncertainty Critical thinking - Evaluating assumptions, challenging data Communication - Explaining and justifying ideas confidently Real-world application - Understanding how maths impacts society and career.
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 Curriculum Delivery Learning Outcomes (Knowledge)	<p>By the end of this unit, students should be able to:</p> <p>1. Understand and Apply the Concept of Estimation</p> <p>Explain what estimation means and why it is useful in real-life and professional contexts Distinguish between estimation and exact calculation</p> <p>2. Make and Justify Assumptions</p>

	<p>Identify when assumptions are needed to solve a problem Make sensible assumptions when information is missing or unclear Justify the validity of assumptions and understand their impact on results</p> <p>3. Use Approximations to Simplify Calculations Round numbers appropriately to significant figures or decimal places Approximate values to make complex calculations simpler Use estimation techniques to check the reasonableness of answers</p> <p>4. Solve Contextual Problems Using Estimation Interpret and tackle real-life problems using estimation (e.g., costs, travel, consumption) Estimate quantities such as time, area, volume, cost, and risk Apply estimation skills in practical scenarios (e.g., planning a journey or project)</p> <p>5. Communicate Methods and Reasoning Clearly Write clear and structured solutions using correct mathematical language Explain estimation processes and assumptions in full sentences Present answers in a format appropriate to the context (e.g., report, table, diagram)</p> <p>6. Evaluate the Validity and Limitations of Estimates Reflect on how realistic an estimate is based on the assumptions made Recognise when a different approach might produce a better estimate Understand the impact of overestimating or underestimating in real-world contexts</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.