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| **Year 10 Curriculum Map : Mathematics** |
|  | **Autumn** | **Spring** | **Summer** |
| **Assessment Objectives** | **AO1** Use and apply standard techniques (Foundation 50%, Higher 40%)**AO2** Reason, interpret and communicate mathematically (Foundation 25%, Higher 30%)**AO3** Solve problems within mathematics and in other contexts (Foundation 25%, Higher30%) |
| **Unit Length** | **Foundation Unit 9** - Graphs **Unit 10** – Transformations**Unit 11 –** Ratio and proportion**Unit 12 –** Pythagoras & Trigonometry**Unit 13 –** Probability**Unit 14 –** Multiplicative Reasoning**Unit 15 –** Plans and elevations**Unit 16 –** Quadratic equations**Unit 17 –** Circles and cylinders**HigherUnit 9** – Equations and inequalities**Unit 10** – Probability**Unit 11 –** Multiplicative reasoning**Unit 12 –** Similarity and congruence**Unit 13 –** Graphs of trigonometry**Unit 14 –** Collecting and representing data**Unit 15 –** Quadratic equations and graphs**Unit 16 –** Circle geometry and circle theorems. | **FoundationUnit 18** – Fractions, Indices and standard form **Unit 19** – Similarity, congruence and vectors**Unit 20** – Equations and graphs**Unit 15b –** Constructions, loci and bearings**HigherUnit 17 –** Equations, formulae, algebraic fractions and surds**Unit 18 –** Vectors and geometric proof**Unit 19 –** Direct and inverse proportion**Unit** | **Foundation**Revision topics based on areas of weakness from trial exam papers.**Higher**Revision topics based on areas of weakness from trial exam papers. |
| **Key Learning Outcomes** | **Foundation Unit 9** - Graphs Drawing graphs, real life graphs, distance-time graphs and y=mx + c.**Unit 10** – TransformationsReflection, rotation, translation, enlargement and combining transformations.**Unit 11 –** Ratio and proportionWriting ratios, dividing amounts into ratios, comparing ratios, using proportion and proportion and graphs.**Unit 12 –** Pythagoras & TrigonometryCalculating missing lengths using Pythagoras, calculating missing lengths or angles using SOHCAHTOA.**Unit 13 –** ProbabilityCalculating probability, two way tables, experimental probability, Venn diagrams and tree diagrams.**Unit 14 –** Multiplicative ReasoningPercentages, growth and decay, compound measures, distance, speed and time, direct and inverse proportion.**Unit 15 –** Plans and elevations3D solids, plans and elevations, accurate drawings, scale drawings and maps.**Unit 16 –** Quadratic equationsExpanding double brackets, plotting quadratic graphs, factorising quadratics, solving quadratic equations.**Unit 17 –** Circles and cylindersCircumference and area of a circle, semi-circles and sectors, cylinders, pyramids, spheres and cones.November Mock exams  | **FoundationUnit 18** – Fractions, Indices and standard form Multiplying and dividing fractions, laws of indices, standard form, calculating with standard form.**Unit 19** – Similarity, congruence and vectorsSimilarity and enlargement, congruence of shapes, vectors**Unit 20** – Equations and graphsGraphs of cubic and reciprocal functions, non-linear graphs, solving simultaneous equations, rearranging formulae and proof.**Unit 15b –** Constructions, loci and bearingsConstruction of shapes accurately, loci, regions and bearings.**HigherUnit 17 –** Equations, formulae, algebraic fractions and surdsRearranging formulae, algebraic fractions, surds, solving algebraic fraction equations and functions**Unit 18 –** Vectors and geometric proofVector notation, vector arithmetic, parallel vectors and collinear points.**Unit 19 –** Direct and inverse proportionDirect proportion, Indirect proportion, exponential functions, non-linear graphs, translating graphs of functions and reflecting and stretching graphs of functions.March Mock exams | **Foundation**Revision topics based on areas of weakness from trial exam papers.GCSE exams  |
| **Prior knowledge** | "AO3: demonstrate knowledge, understanding and skills in handlingdata:• statistics• probability.""AO3: demonstrate knowledge, understanding and skills in handlingdata:• statistics• probability.""AO1: demonstrate knowledge, understanding and skills in number and algebra: • numbers and the numbering system• calculations • solving numerical problems • equations, formulae and identities • sequences, functions and graphs.""AO1: demonstrate knowledge, understanding and skills in number and algebra: • numbers and the numbering system• calculations • solving numerical problems • equations, formulae and identities • sequences, functions and graphs.""AO2: demonstrate knowledge, understanding and skills in shape,space and measures:• geometry• vectors and transformation geometry. 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| **CEIAG** **Specific careers links** | The specific value of maths as a required or preferred subject for particular careers, e.g.: * Engineers and engineering technicians
* Surveyors and surveying technicians
* Systems analysts
* Actuaries
* Accountants
* Operational researchers
* Chemists
* Software engineers
* Statisticians
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| **RRSA** | Article 2 – Non discriminationArticle 12 – Respect for the views of the childArticle 13 – Freedom of expressionArticle 14 – Freedom of thought, belief and religionArticle 15 – Freedom of associationArticle 16 – Right to privacyArticle 23 – Right to a full life if child with disabilityArticle 28 – Right to educationArticle 29 – Goals of educationArticle 42 – Knowledge of rights | Article 2 – Non discriminationArticle 12 – Respect for the views of the childArticle 13 – Freedom of expressionArticle 14 – Freedom of thought, belief and religionArticle 15 – Freedom of associationArticle 16 – Right to privacyArticle 23 – Right to a full life if child with disabilityArticle 28 – Right to educationArticle 29 – Goals of educationArticle 42 – Knowledge of rights | Article 2 – Non discriminationArticle 12 – Respect for the views of the childArticle 13 – Freedom of expressionArticle 14 – Freedom of thought, belief and religionArticle 15 – Freedom of associationArticle 16 – Right to privacyArticle 23 – Right to a full life if child with disabilityArticle 28 – Right to educationArticle 29 – Goals of educationArticle 42 – Knowledge of rights |
| **Cross curricular links** | Art & Design and Maths* Symmetrical art can be analysed and the number of lines of symmetry can be found. Also, the order of rotational symmetry can be studied.
* Ratio is used to mix paints. For example, to make purple, you mix 3 parts red to 7 parts blue.
* You could also explore the [Art through mathematics](https://www.ncetm.org.uk/resources/38454) section on the NCETM website.

English and Maths* Spelling mathematical vocabulary correctly and using it in the correct context.
* Mastery of maths is advanced by children being able to explain their mathematical thinking to others and to justify methods and conclusions.
* English skills can be used to clearly interpret and discuss results you get from collecting data in maths lessons.
* Solving comprehension questions from [maths comprehension cards](https://www.learningresources.co.uk/category/products/maths-comprehension-cards.do).

Design & Technology and Maths* Reading Scales.
* Measuring ingredients and working out proportions.
* Using ratios in recipes.

Geography and Maths* Collecting and representing data from field trips or for weather investigations.
* Grid references and coordinates.
* Using scales on Ordnance Survey maps to establish the correct distance between two points.

Computing and Maths* Angles and direction which can be drawn and measured using floor robots and apps too.
* Information can be represented in Excel and calculations using formula can be done on the data here too.
* Logic is used in programming as is problem solving.

Foreign Languages and Maths* Numbers can be used to do sums or times tables in French.
* Asking what time it is in another language.

Music and Maths* Time and speed can be represented by tempo which is the number of beats per minute (BPM).
* Equivalent fractions can be shown using musical notation where a different type of note is worth a different fraction of a whole beat.

History and Maths* Historical timelines can be used as a basis for finding the difference in dates.
* Historical dates can also be utilised for sequencing events.

Physical Education and Maths* Time, distance and speed of races can be incorporated into Maths sessions to enable children
* Averages (Mean, Mode and Median) can be used to assess and athlete’s performance.
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| **Useful websites/videos** | <https://www.bbc.co.uk/bitesize/subjects/zqhs34j><https://hegartymaths.com/><https://corbettmaths.com/> |
| **Wider Reading** | * Research the history of algebra. Where did the word algebra derive from? Which civilizations introduced algebra? Who were the early pioneers?
* Investigate Egyptian fractions. What are they? How did they work? Are they still used anywhere today? What are the benefits and drawbacks of Egyptian fractions?
* Investigate misleading graphs. Where can they be seen? Why would the media use misleading charts or graphs?
* Research Greek Mathematician Pythagoras of Samos. Investigate some careers where Pythagoras and trigonometry skills could be required.
* Investigate where averages are used in everyday life. What jobs might require you to work with averages.
* Investigate quadratic graphs. What do they look like? Where might quadratic graphs be used in real life?
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| **Literacy Programme** | * Decode it NOW
* Guided practice/model answers
* Sentence Starters
* Writing strategies
 | * Decode it NOW
* Guided practice/model answers
* Sentence Starters
* Writing strategies
 | * Decode it NOW
* Guided practice/model answers
* Sentence Starters
* Writing strategies
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| **Independent Learning Tasks** | Hegarty maths tasksKnowledge organisers  | Hegarty maths tasks Knowledge organisers | Hegarty maths tasksKnowledge organisers  |