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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  **Higher Unit 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. | **Foundation Unit 18** – Fractions, Indices and standard form  **Unit 19** – Similarity, congruence and vectors  **Unit 20** – Equations and graphs  **Unit 15b –** Constructions, loci and bearings  **Higher Unit 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** – Transformations Reflection, rotation, translation, enlargement and combining transformations. **Unit 11 –** Ratio and proportion Writing ratios, dividing amounts into ratios, comparing ratios, using proportion and proportion and graphs. **Unit 12 –** Pythagoras & Trigonometry Calculating missing lengths using Pythagoras, calculating missing lengths or angles using SOHCAHTOA. **Unit 13 –** Probability Calculating probability, two way tables, experimental probability, Venn diagrams and tree diagrams. **Unit 14 –** Multiplicative Reasoning Percentages, growth and decay, compound measures, distance, speed and time, direct and inverse proportion. **Unit 15 –** Plans and elevations 3D solids, plans and elevations, accurate drawings, scale drawings and maps. **Unit 16 –** Quadratic equations Expanding double brackets, plotting quadratic graphs, factorising quadratics, solving quadratic equations. **Unit 17 –** Circles and cylinders Circumference and area of a circle, semi-circles and sectors, cylinders, pyramids, spheres and cones.  November Mock exams | **Foundation Unit 18** – Fractions, Indices and standard form  Multiplying and dividing fractions, laws of indices, standard form, calculating with standard form. **Unit 19** – Similarity, congruence and vectors Similarity and enlargement, congruence of shapes, vectors  **Unit 20** – Equations and graphs Graphs of cubic and reciprocal functions, non-linear graphs, solving simultaneous equations, rearranging formulae and proof.  **Unit 15b –** Constructions, loci and bearings  Construction of shapes accurately, loci, regions and bearings.  **Higher Unit 17 –** Equations, formulae, algebraic fractions and surds Rearranging formulae, algebraic fractions, surds, solving algebraic fraction equations and functions  **Unit 18 –** Vectors and geometric proof Vector notation, vector arithmetic, parallel vectors and collinear points. **Unit 19 –** Direct and inverse proportion Direct 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 handling  data:  • statistics  • probability."  "AO3: demonstrate knowledge, understanding and skills in handling  data:  • 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. "  "AO3: demonstrate knowledge, understanding and skills in handling  data:  • statistics  • probability."  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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 | 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 | 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 |
| **RRSA** | Article 2 – Non discrimination  Article 12 – Respect for the views of the child  Article 13 – Freedom of expression  Article 14 – Freedom of thought, belief and religion  Article 15 – Freedom of association  Article 16 – Right to privacy  Article 23 – Right to a full life if child with disability  Article 28 – Right to education  Article 29 – Goals of education  Article 42 – Knowledge of rights | Article 2 – Non discrimination  Article 12 – Respect for the views of the child  Article 13 – Freedom of expression  Article 14 – Freedom of thought, belief and religion  Article 15 – Freedom of association  Article 16 – Right to privacy  Article 23 – Right to a full life if child with disability  Article 28 – Right to education  Article 29 – Goals of education  Article 42 – Knowledge of rights | Article 2 – Non discrimination  Article 12 – Respect for the views of the child  Article 13 – Freedom of expression  Article 14 – Freedom of thought, belief and religion  Article 15 – Freedom of association  Article 16 – Right to privacy  Article 23 – Right to a full life if child with disability  Article 28 – Right to education  Article 29 – Goals of education  Article 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. | | |
| **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? | | |
| **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 |
| **Independent Learning Tasks** | Hegarty maths tasks  Knowledge organisers | Hegarty maths tasks  Knowledge organisers | Hegarty maths tasks  Knowledge organisers |