Curriculum overview: Mathematics

Why do we study Maths at The Earls High School?
Mathematics is a powerful tool that has many applications to real life, It is therefore important that students are fluent in the fundamentals of Mathematics and how it can help them in everyday life. (Budgeting, using recipes, understanding nutrient labels on food, reading timetables) The study of Mathematics at The Earls develops students' Mathematical reasoning skills that promote a logical thought process which will enable students to become analytical thinkers. Students will have opportunities to explore Mathematical and non-Mathematical contexts where they are required to develop and apply a strategy to solve a problem using a series of Mathematical processes. At The Earls, the study of Mathematics also reflect the importance of communication skills and students are encouraged to develop their Mathematical vocabulary when participating in discussions, justifying their methods or presenting Mathematical arguments and proofs. Mathematics also provides cross curricular links to subjects such as Science, Geography and Computer Science where a secure knowledge of Mathematics is required.
What skills and knowledge do we anticipate students will have in this subject before they begin at The Earls High School?
There is an expectation that students have a good understanding of the statutory requirements as set out in the programmes of study for Key Stage 2 Mathematics National Curriculum.
What skills and knowledge would we like students to have in this subject at the end of their time at The Earls High School?
By the end of Key Stage 4, students will be confident across the three strands of mathematical fluency, reasoning mathematically and being able to use their mathematical ability to solve problems within mathematical and non-mathematical contexts. **Develop Fluency** Students will have consolidated their knowledge of the number system extending to standard form, limits of accuracy and powers and roots. (Fractional indices higher tier). Students should be able to select and use an appropriate method to solve a complex problem, including calculations using multiples of pi. Consolidated their understanding of algebraic manipulation and simplification to include quadratics expressions and equations. (Surds and algebraic fractions higher tier). Be fluent with expressions and equations to quadratics equations, simultaneous equations, and inequalities. Students will be able to understand and makes links between numerical, algebraic, graphical and diagrammatic representations including that of linear, quadratic, reciprocal functions (exponential and trigonometric functions Higher tier) **Reason Mathematically** Be able to make connections on ratio and proportion to include trigonometric ratios working with measures and geometry, understand proportional relations algebraically and graphically. Extend their ability to identify variables and express relationships between variables algebraically and graphically. Make and test conjectures from general patterns and relationships, be able to provide counter examples. Use algebra to support and construct arguments (proofs Higher tier) Reason deductively across geometry, number and algebra including geometric constructions. Explore what can and cannot be inferred in statistical and probabilities settings and express arguments formally. Assess the validity of an argument or the accuracy of a given method. **Problem Solving** Students will be able to use their knowledge to interpret and solve problems in different contexts including financial contexts. Make connections between different areas of Mathematics and be able to solve a given problem. Students will be able to model situations mathematically and reflect on how their results may have been affected by any assumptions. Students will be confident on selecting an appropriate method and technique and apply this in an unfamiliar concept.

Year 7 Mathematics Curriculum Map:

Autumn Term	Spring Term	Summer Term
Half term 1 **To learn about:** *Number operations* including using and **applying** arithmetic with integers and decimals. Working with negative numbers and **applying** to real life. Understanding *Place value*, including rounding. Using *BIDMAS*. *Number Properties*, understanding the difference between factors and multiples and calculating highest common factors/lowest common multiples both with and without the use of Venn diagrams. **Main home learning tasks:** There will be one homework per fortnight. This will either be mixed topic questions, focussing on the topics studied in Year 7; a Mathswatch revision homework, consolidating knowledge gained from a specific topic, in preparation for a topic test or a Hegarty Maths revision homework to consolidate a topic they have recently completed. **Key assessment:** Students will be tested after each of the topics outlined in mini-assessments.	**Half Term 3** **To learn about**: Understanding the fundamentals of Ratio and *proportion*, simplifying ratios, equivalent ratios, sharing into a ratio (using bar modelling). *Probability*, both single event and two-event, including worded probability and expressing as fractions, decimals and percentages. **Main home learning tasks:** There will be one homework per fortnight. This will either be mixed topic questions, focussing on the topics studied in Year 7; a Mathswatch revision homework, consolidating knowledge gained from a specific topic, in preparation for a topic test or a Hegarty Maths revision homework to consolidate a topic they have recently completed. **Key assessment:** Students will be tested after each of the topics outlined in mini-assessments.	**Half Term 5** **To learn about:** Understanding *360 degrees around a full turn*, and how this can be used to solve questions in relation to angles in triangles, quadrilaterals, polygons and also **applied** to multistep problem solving questions. *Dimensions*, including length and area and **applying** this to problem solving exercises. **Main home learning tasks:** There will be one homework per fortnight. This will either be mixed topic questions, focussing on the topics studied in Year 7; a Mathswatch revision homework, consolidating knowledge gained from a specific topic, in preparation for a topic test or a Hegarty Maths revision homework to consolidate a topic they have recently completed. **Key assessment:** Students will be tested after each of the topics outlined in mini-assessments.
Half Term 2 **To learn about:** *Equivalent fractions*, including arithmetic with fractions and **applying** to worded problem questions. Using and **applying** percentages of amounts by linking it to *Proportion*. Understanding the connection between Fractions, Decimals and Percentages **Main home learning tasks:** There will be one homework per fortnight. This will either be mixed topic questions, focussing on the topics studied in Year 7; a Mathswatch revision homework, consolidating knowledge gained from a specific topic, in preparation for a topic test or a Hegarty Maths revision homework to consolidate a topic they have recently completed. There will also be a Mathswatch revision homework in preparation for assessment 1 and an improvement task homework. There may occasionally be weekly homeworks rather than fortnightly to allow for completion of these homework tasks. **Key assessment:** One exam per term. We will be doing a revision week in the run up to the exam and then an Improvement Task week to	**Half Term 4 To** **learn about:** Continue with *Probability*, both single event and two-event, including worded probability and expressing as fractions, decimals and percentages. *Properties of shape*, specifically triangles and quadrilaterals. **Main home learning tasks:** There will be one homework per fortnight. This will either be mixed topic questions, focussing on the topics studied in Year 7; a Mathswatch revision homework, consolidating knowledge gained from a specific topic, in preparation for a topic test or a Hegarty Maths revision homework to consolidate a topic they have recently completed. There will also be a Mathswatch revision homework in preparation for assessment 1 and an improvement task homework. There may occasionally be weekly homeworks rather than fortnightly to allow for completion of these homework tasks. **Key assessment:** Assessment 2 will include all topics taught since Assessment 1 and topics from Term 1 as well. We will be doing a revision week in the run up to the exam and then an Improvement Task week to "Close any Gaps".	**Half Term 6** **To learn about:** *Averages,* including pie charts and bar charts. Also lots of revision in preparation for the summer exams which happen after half term. **Main home learning tasks**: There will be one homework per fortnight. This will either be mixed topic questions, focussing on the topics studied in Year 7; a Mathswatch revision homework, consolidating knowledge gained from a specific topic, in preparation for a topic test or a Hegarty Maths revision homework to consolidate a topic they have recently completed. There will also be a Mathswatch revision homework in preparation for assessment 1 and an improvement task homework. There may occasionally be weekly homeworks rather than fortnightly to allow for completion of these homework tasks. **Key assessment**: Main summer exam. There will be two papers, one calculator and one non-calculator. These exams will be based on everything they have done all year so far. **Assessment condition**s:

“Close any Gaps”. The exam will cover all topics taught this half term **Assessment conditions:** Non-calculator paper. In class in exam conditions.	**Assessment conditions:** Calculator paper. In class in exam conditions.	A Non-calculator and a calculator paper. In class in exam conditions.

Year 8 Mathematics Curriculum Map:

Autumn Term	Spring Term	Summer Term
Half term 1 **To learn about:** Understanding Bills, e.g. gas and electricity and understanding a bank balance (debit and credit). Percentage increase and decrease, using *proportion*, as well as multipliers. Understanding that *what works with number works with algebra* and apply this to collecting algebraic terms, algebraic expansion and substitution. **Main home learning tasks:** There will be one homework per fortnight. This will either be mixed topic questions, focussing on the topics studied in Year 7; a Mathswatch revision homework, consolidating knowledge gained from a specific topic, in preparation for a topic test or a Hegarty Maths revision homework to consolidate a topic they have recently completed. **Key assessment:** Students will be tested after each of the topics outlined in mini-assessments.	**Half Term 3 To learn about**: Investigating sequences, including linear, quadratic, geometric and the Fibonacci sequence. Finding the nth term of a linear sequence, and applying this understanding to worded problem questions. Progressing from fundamental *Proportion* skills acquired in Year 7 to being able to tackle a variety of problem solving aspects of the ratio topics. **Main home learning tasks:** There will be one homework per fortnight. This will either be mixed topic questions, focussing on the topics studied in Year 7; a Mathswatch revision homework, consolidating knowledge gained from a specific topic, in preparation for a topic test or a Hegarty Maths revision homework to consolidate a topic they have recently completed. **Key assessment:** Students will be tested after each of the topics outlined in mini-assessments.	**Half Term 5** **To learn about:** Developing previous understanding of *360 degrees in a full turn* and applying this to angles in parallel lines. Developing *Dimensions* knowledge further, including volume, plans, nets and elevations and surface area. All of these skills will be applied to problem solving scenarios. **Main home learning tasks:** There will be one homework per fortnight. This will either be mixed topic questions, focussing on the topics studied in Year 7; a Mathswatch revision homework, consolidating knowledge gained from a specific topic, in preparation for a topic test or a Hegarty Maths revision homework to consolidate a topic they have recently completed. **Key assessment:** Students will be tested after each of the topics outlined in mini-assessments.
Half Term 2 **To learn about:** Developing knowledge of algebra further, understanding the *balance method* with relation to both equations and inequalities. **Main home learning tasks:** There will be one homework per fortnight. This will either be mixed topic questions, focussing on the topics studied in Year 7; a Mathswatch revision homework, consolidating knowledge gained from a specific topic, in preparation for a topic test or a Hegarty Maths revision homework to consolidate a topic they have recently completed. There will also be a Mathswatch revision homework in preparation for assessment 1 and an improvement task homework. There may occasionally be weekly homeworks rather than fortnightly to allow for completion of these homework tasks. **Key assessment:** One exam per term. We will be doing a revision week in the run up to the exam and then an Improvement Task week to "Close any Gaps". The exam will cover all topics taught so far this Term and will include topics from Year 7. **Assessment conditions:**	**Half Term 4 To learn about:** Recap knowledge of *dimensions* discovered in year 7 and developing this to include understanding Pi and finding the area and circumference of circles. **Main home learning tasks:** There will be one homework per fortnight. This will either be mixed topic questions, focussing on the topics studied in Year 7; a Mathswatch revision homework, consolidating knowledge gained from a specific topic, in preparation for a topic test or a Hegarty Maths revision homework to consolidate a topic they have recently completed. There will also be a Mathswatch revision homework in preparation for assessment 1 and an improvement task homework. There may occasionally be weekly homeworks rather than fortnightly to allow for completion of these homework tasks. **Key assessment:** Assessment 2 will occur after February half term and will include all topics taught since Assessment 1. We will be doing a revision week in the run up to the exam and then an Improvement Task week to "Close any Gaps". The exam will	**Half Term 6** **To learn about:** Continuing to develop *Dimensions* knowledge further, focusing on volume. All of the previously mentioned skills will be applied to problem solving scenarios. Plotting linear, quadratic and cubic graphs, by substituting values of x and completing a table of values. **Main home learning tasks**: There will be one homework per fortnight. This will either be mixed topic questions, focussing on the topics studied in Year 7; a Mathswatch revision homework, consolidating knowledge gained from a specific topic, in preparation for a topic test or a Hegarty Maths revision homework to consolidate a topic they have recently completed. There will also be a Mathswatch revision homework in preparation for assessment 1 and an improvement task homework. There may occasionally be weekly homeworks rather than fortnightly to allow for completion of these homework tasks. **Key assessment**: Main summer exam. Exams will be based on everything they have done all year so far. **Assessment condition**s:

A non-calculator paper. In class in exam conditions.	cover all topics taught this Term and will include topics from last Term and Year 7. **Assessment conditions:** A calculator paper. In class in exam conditions.	In class in exam conditions. One calculator and one non-calculator paper

Year 9 Curriculum Map: Mathematics

Autumn Term	Spring Term	Summer Term
Half term 1 **To learn about:** **Number properties:** Factors, multiples, primes, HCF,LCM and indices, **Equivalent Fractions**: comparing, adding, subtracting, multiplying, dividing, using mixed numbers **Percentages**: increases and decreases, interest, reverse percentage and applying percentages. **Algebra:** expanding single and double brackets. Factorising linear expressions with some extending to quadratics. **Main home learning tasks:** There will be one homework per week. Most of the time this will be a retrieval based homework which is completed using Hegarty Maths (watching videos and completing the quiz). **Key assessment:** Pupils will be practicing GCSE questions in lessons and will be tested before the end of the term. (with some mini topic tests in lesson).	**Half Term 3** **To learn about**: **Place value and number properties**: multiplying with powers of ten, standard form, multiplying and dividing in standard form, upper and lower bounds and mathematical reasoning. **Loci and constructions**- Draw a range of locus for given rules. **360 (Angles):** Angle facts, including angles around a point, in different polygons, on parallel lines, multi-step problems and bearings. Begin to work with circle theorems (higher). **Compound units:** speed, density, rates of pay and prices per unit. **Main home learning tasks:** There will be one homework per week. Most of the time this will be a retrieval based homework which is completed using Hegarty Maths (watching videos and completing the quiz) **Key assessment:** Pupils will be practicing GCSE questions in lessons and will be tested before the end of the term. (with some mini topic tests in lesson)	**Half Term 5** **To learn about:** **Sequences:** spotting patterns in number, naming and generating sequences (nth term). Recognise square, cube, Fibonacci and quadratic sequences **Graph**- Plotting a variety of graphs (straight line, quadratic, cubic). Understanding the equation of a straight line (y=mx+ c) and simultaneous equations graphically. **Simultaneous Equations:** be able to solve a variety of equations including simultaneous. Both algebraically and graphically. **Main home learning tasks:** There will be one homework per week. Most of the time this will be a retrieval based homework which is completed using Hegarty Maths (watching videos and completing the quiz) **Key assessment:** Pupils will be practicing GCSE questions in lessons and will be tested before the end of the term. (with some mini topic tests in lesson)
Half Term 2 **To learn about:** **Algebra:** expanding single and double brackets. Factorising linear expressions with some extending to quadratics. **Ratio:** Convert between units, real life scales, share in a ratio, best value, bar modelling and problem solving. **Balance Method:** Solving one, two and multiple step linear equations including ones with brackets and unknowns on both sides. Recognising and working with inequalities. Rearranging formulae. Solving quadratic equations. **Main home learning tasks:** There will be one homework per week. Most of the time this will be a retrieval based homework which is completed using Hegarty Maths (watching videos and completing the quiz) **Key assessment:** One exam per term. Pupils will have access to a topic list on Show My Homework. A mathswatch assignment is created to support pupils with revision. **Assessment conditions:** In class in exam conditions.	**Half Term 4 To learn about:** **Dimensions:** calculate the areas of 2d shapes. Along with surface areas and volume of 3d Shapes. Extension to sectors and non prism 3D shapes. **Pythagoras' theorem:** calculating lengths and problem solving **Trigonometry**: explore right angled triangles and there ratios of angles and lengths. Use and understand sine, cosine and tangent ratios and calculate missing lengths and angles. **Main home learning tasks:** There will be one homework per week. Most of the time this will be a retrieval based homework which is completed using Hegarty Maths (watching videos and completing the quiz) **Key assessment:** Assessment 2 will occur after February half term We will be doing a revision week in the run up to the exam and then an Improvement Task week to "Close any Gaps". A topic list will be given so pupils know what will be on the assessment.	**Half Term 6** **To learn about:** **Using and comparing data**; graphs, diagrams and two way tables. **Loci and constructions**: how to construct the locus of a point and a line, how to bisect angles and lines, as well as how to form triangles from instructions. **Congruence and similarity**: how to identify congruent and similar shapes, how to use congruence and similarity in problem solving and begin proving congruence. **Revision**: Time will be given to revise topics covered throughout the year in preparation for the final assessment including GCSE style questions. **Main home learning tasks:** There will be one homework per week. Most of the time this will be a retrieval based homework which is completed using Hegarty Maths (watching videos and completing the quiz) **Key assessment**: The summer assessment happens after half term. We will be doing a revision week in the run up to the exam and then an Improvement Task week to "Close any Gaps". A topic list will be given so pupils know what will be on the assessment.