Curriculum Overview – Year 10

Year 10 is the first year of the GCSE course. In maths we follow the Edexcel GCSE specification with students following either the higher or foundation course. They will be sitting three papers at the end of Year 11 (two calculator papers and one non-calculator paper). Year 10 set 1 and set 2 students will follow the full Edexcel Higher GCSE scheme of work and sets 3, 4, 5 and White Pathway students follow the full Foundation Edexcel scheme. As with every academic year the setting is fluid and therefore students may move from foundation to higher or vice versa as they progress through Year 10. Where this is the case students will be supported in ensuring any knowledge gaps are addressed as required. As always we ensure that we stretch and challenge students appropriately in every lesson whilst also ensuring we provide support to those that need it, spending longer on some topics with some classes than we would with others.

How can parents best support?

Over the course of the academic year parents and guardians can best support their child in a number of ways.

As we move into the GCSE course it is vital that your child owns a scientific calculator that they can use to complete homework tasks to the best of their ability. The model we use in lessons is the Casio FXG58T and it can be purchased either from the academy or in the majority of supermarkets and stationary stores.

Another key way to support is by helping your child to complete all of their maths homework on time. At the Sutton Academy we appreciate that maths is not all parents 'cup of tea' so we strive to ensure that you can easily support with any tasks simply by guiding your child in the right direction for support.

Each week your child will be set two pieces of homework by their maths teacher. One of the homework tasks set for our students will be a topic based worksheet designed specifically to aid with retention of key topics that have been learned in previous lessons. You can support your child in completing this by helping them to access the correct Hegarty Maths videos which are provided on every homework task.

The second homework task that students will be set is a Hegarty Maths task. This will be on something that your child needs to revise based on assessment during lesson time and in tracking exams. To support your child in completing this please encourage them to use the website to its maximum potential, completing questions on paper to practise showing their working before inputting their answers. It would also be great if you could ensure that they access the videos that come with any tasks that they struggle with rather than just giving up.

Each half term the two weekly homework tasks will be replaced with a 'homework booklet'. This booklet is a past GCSE exam paper which we would like your child to spend a week completing. The idea behind the booklet is to enable your students to spend a decent amount of time getting used to reading exam questions and identifying the skills that they need to apply to them. To support them in completing this the front cover will detail all of the Hegarty Maths clips that can be used to help them to answer each question. If you could encourage your child to use this then it will really help them in learning how to tackle the tougher exam questions that we know they struggle with.

As well as completing homework it would be greatly beneficial to encourage your child to use Hegarty Maths independently to practise the skills they have been learning in maths. Using the Hegarty Maths guide that we have created students can easily go over any topics that they have been taught as extra revision.

One final way that you can help your students to progress in maths is to encourage them to use and work through the topics highlighted on their 'Personal Learning Checklist. After every round of tracking exams in Years 10 and 11 students will be given a breakdown of their exams in a 'red, amber, green' format. This will provide details of all of the topics that appeared on the exam that they sat and how they scored in the exam. If your child achieved full marks this topic will appear with a green box next to it. If they achieved some marks but not full marks it will appear as amber and if they didn't achieve any marks then the topic will be in red. This clearly identifies your child's areas strengths and areas for development. Please celebrate the successes with your child and support them in developing their understanding of the topics that they didn't perform well on using Hegarty Maths. The checklist will state the clip numbers that your child needs to revise to make it easy for them to find what they need quickly. If you could encourage them to work their way through practising their red and amber topics then hopefully we will see improvements in these areas in their next tracking exams.

Unit Title	Learning – Topics in bold are only studied by Higher tier students	Additional learning covered by Higher tier students
Number Skills	During this unit of work students will learn how to: • Understand and use place value • Round accurately to decimal places and significant figures in order to estimate answers • Determine upper and lower bounds for a rounded number • Write error intervals • Add, subtract, multiply and divide decimals accurately • Calculate with powers and roots • Use BIDMAS to calculate accurately • Use the index laws • Convert numbers in and out of standard form • Identify and list factors, multiples and primes • Calculate fractions of amounts • Add, subtract, multiply and divide fractions and mixed numbers • Solve problems involving percentages with and without a calculator	• **Fractional indices** • **Calculating with numbers written in standard form** • **Simplifying surd expressions** • **Rationalising denominators**
Fractions, Decimals and Percentages	During this unit of work students will learn how to: • Use fraction notation • Simplify fractions and find equivalent fractions • Convert between improper fractions and mixed numbers • Add, subtract, multiply and divide fractions and mixed numbers • Calculate fractions of amounts • Convert between fractions, decimals and percentages • Calculate percentages of amounts with and without a calculator • Increase and decrease by a percentage • Calculate percentage change • Solve problems involving simple and compound interest • Solve problems involving reverse percentages	

Algebraic Expressions and Equations	During this unit of work students will learn how to: • Construct algebraic expressions from words • Simplify expressions by collecting like terms • Simplify expressions involving multiplication and division • Construct expressions to describe the perimeter of a shape • Expand single brackets • Factorise linear expressions • Substitute numbers into formulae • Solve simple linear equations involving one variable • Solve two step linear equations • Solve linear equations where there is an unknown on both sides of the equal sign • Form and solve linear equations to solve real life problems • Represent and solve inequalities • Solving simultaneous equations • Rearrange simple formulae • Factorising quadratic expressions where the coefficient of x^2 is 1	• **Factorising quadratic expressions where the coefficient of x^2 is greater than 1** • **Rearranging more complicated formulae** • **Simplifying algebraic fractions** • **Solving equations involving the simplification of algebraic fractions** • **Solving quadratic equations by factorising** • **Solving quadratic equations using the quadratic formula** • **Forming and solving quadratic equations** • **Quadratic inequalities** • **Completing the square** • **Quadratic simultaneous equations** • **Iteration**
Ratio and Proportion	During this unit of work students will learn how to: • Simplify ratio • Divide amounts into a given ratio • Solve problems involving ratio • Convert between currencies • Scale up recipes and solve other real life problems • Solve real life problems involving proportion • Use and interpret statements involving direct and inverse proportion	• **Solving more complex problems involving direct and inverse proportion**

2D Geometry	During this unit of work students will learn how to: - Identify irregular and regular shapes by counting faces, vertices, edges - Identify lines of symmetry within 2D shapes. - Draw and measure angles accurately using a protractor - Calculate missing angles around a point, on a line and in triangles - Calculate missing angles in polygons - Calculate missing angles in parallel lines - Construct shapes using a pair of compasses and a protractor - Construct regions using a pair of compasses - Calculate perimeter and area of 2D shapes including compound shapes - Calculate area and circumference - Calculate the area and perimeter of sectors of circles - Calculate missing lengths using Pythagoras' theorem in 2D - Calculate missing lengths and angles using SOHCAHTOA in 2D - Solve multi-step problems using Pythagoras' theorem and SOHCAHTOA in 2D	**Work backwards to calculate missing angles and lengths given the arc length, area or perimeter of a sector** **Apply Pythagoras' theorem to graphs** **Use Pythagoras' theorem in 3D** **Use SOHCAHTOA in 3D** **Use the sine and cosine rules** **Use trigonometry to calculate the area of a triangle** **Solve multi-step problems involving trigonometry in non-right angled triangles** **Know and apply the circle theorems to solve problems**
Data and Statistics	By the end of this unit students should be able to: - Use different methods of data collection - Use different sampling techniques - Explain how bias impacts on the accuracy of data - Calculate the mean, median, mode and range for a small data set - Calculate the mean and median from frequency tables - Identify the mode or modal class from a frequency table - Representing data in pictograms, bar charts, stem and leaf diagrams, two way tables, pie charts and scatter graphs - Interpret pictograms, bar charts, stem and leaf diagrams, two way tables, pie charts and scatter graphs - Draw and interpret time series	**Draw and interpret frequency polygons** **Draw and interpret cumulative frequency curves** **Draw and interpret box plots** **Draw and interpret histograms**

3D Shapes	By the end of this unit students should be able to: • Identify 3D shapes • Draw nets, plans and elevations for 3D shapes • Calculate the volume of prisms • Calculate surface area • Calculate the volume and surface of cones, spheres and pyramids	• **Calculate the volume and surface area of compound shapes made from cones, spheres and pyramids including frustums** • **Solving more complex problems involving the volume and surface area of cones, spheres and pyramids including working backwards**
Compound Measures	By the end of this unit students should be able to: • Calculate with density, mass and volume • Calculate with speed, distance and time	• **Calculate with upper and lower bounds**
Graphs	By the end of this unit students should be able to: • Draw and interpret real life graphs • Draw straight line graphs • Find the equation of a straight line • Draw quadratic graphs • Draw cubic graphs • Draw reciprocal graphs	• **Find the equation of a straight line given coordinates** • **Solve problems involving parallel and perpendicular lines** • **Interpret quadratic, cubic and reciprocal graphs** • **Find solutions to quadratic equations using the graphs** • **Draw and interpret graphs of trigonometric functions** • **Use and interpret the equation of a circle** • **Interpret velocity-time graphs**
Geometry, Functions and Proof	By the end of this unit students should be able to: • Reflect shapes in a given mirror line • Translate shapes by a column vector • Enlarge shapes by a positive scale factor • Rotate shapes • Identify shapes that are congruent • Identify shapes that are similar • Calculate missing lengths in similar shapes	• Enlarge shapes by negative and fractional scale factors • Use similarity in 3D shapes • Prove congruence using the properties of triangles • Solve problems involving combinations of transformations • Identify points of invariance following transformations • Find composite functions • Find inverse functions • Transform graphs • Vector proof • Algebraic proof

Probability	By the end of this unit students should be able to:	• **Solve problems involving tree diagrams and algebraic fractions**
	• Represent probabilities on a probability scale	
	• Write the probability of an event as a fraction, decimal or percentage	
	• Conduct probability experiments	
	• Strategically list the outcomes of an event using sample space diagrams	
	• Understand how to determine the number of combinations that can be achieved in an event	
	• Use 1 – p to calculate missing probabilities in a table	
	• Use probability to calculate relative frequency	
	• Construct and use tree diagrams	
	• Construct and use Venn diagrams	
	• Interpret Venn notation	