



Subject: Mathematics

Lead Teacher: Mr A Heighway

Year: 10

Curriculum organisation

Students are taught for three lessons a week in three groups of 30. There is a set A and two parallel ability set Bs.

Overview of Topics & Key Information

How will your child be learning?

Term	Unit(s) of Work	Key Enquiry Questions	Key Content/ Terminology	Skills developed	How will your child be learning?
Autumn Term	<ul style="list-style-type: none"> Area and perimeter Probability Vectors Quadratics Trigonometry 	<ul style="list-style-type: none"> What dimensions of a rectangle give the same area and perimeter? What is the most likely outcome of rolling two die and summing the results? How does given that change the probability? How do you prove that two vectors are parallel? What is the method for factorising quadratics? Do all quadratics have real solutions, if not, why? What is the shape of a quadratic graph? What information do you need to sketch a quadratic graph? What are the uses of completing the square? How do you find unknown sides and angles in a non-right-angle triangle? How can Pythagoras' theorem be used to find lengths in three dimensions? How do trigonometric graphs help you solve trigonometric equations? 	<ul style="list-style-type: none"> Area, perimeter, trapezium, parallelogram, compound shapes Venn diagrams, tree diagrams, sample space, combined events, relative frequency, enumeration, addition law, multiplication law, conditional probability Vectors, parallel, coplanar, column vectors Factorise, completing the square, discriminant, quadratic formula, roots, vertices, parabola Sine rule, cosine rule, area of any triangle, trigonometric graphs, 3D Pythagoras' theorem 	<ul style="list-style-type: none"> Calculate areas and perimeters of 2d shapes Use experiments to estimate probabilities, find the probability of single and combined events, illustrate probabilities using appropriate diagrams, use product rules for calculating combinations Add, subtract and multiply vectors by scalars, use vectors in geometric argument and proof Factorise quadratic expressions, solve quadratic equations, write quadratic expressions in completed square form, draw quadratic graphs Apply sine and cosine rule to find unknown angles and sides in non-right-angled triangles, find area of any size triangle, draw trigonometric graphs, solve trigonometric equations, apply Pythagoras' theorem in three dimensions, apply trigonometry in three dimensions 	<ul style="list-style-type: none"> Whole class discussion Pair work Problem-solving tasks Independent work Group work Investigations

<p>Spring Term</p>	<ul style="list-style-type: none"> • Circles • Approximating and estimating • Circle theorems • Circles and tangents • Data • 3D shapes • Volume and surface area 	<ul style="list-style-type: none"> • What is pi? • How are the formulae for circumference and area of circles related to arc lengths and area of sectors? • If a number has been rounded to 1 decimal place, what are the upper and lower bounds? • What conditions do you need to apply the circle theorems? • Why does the equation of a circle have that form? • Does the point (3,4) lie inside, on or outside the circle $x^2+y^2=9$? • How are the gradients of tangents and radii related? • What is the equation of a vertical tangent? • Do groups have to be equal widths in histograms? • What is frequency density? • Can you estimate data outside the range of values used? • How do you estimate the mean from grouped data? • What comparisons can you make between these two data sets? • Find the radius of a sphere given a known volume • How do you find the volume of a frustum? 	<ul style="list-style-type: none"> • Circumference, chord, arc lengths, sectors, segments • Rounding, significant figures, upper and lower bounds, limits of accuracy • Circle theorems, subtended • Equations of circles and tangents • Sampling, discrete and continuous data, grouped data, class width, histograms, cumulative frequency diagrams, box plots, misleading diagrams, pie charts, bar charts, averages – mean, mode and median, interquartile range, bivariate data, correlation, lines of best fit • Plans, front and side elevation • Volume, surface area, sphere, pyramid, cone, prism, cylinder, frustums 	<ul style="list-style-type: none"> • Calculate circumference and area of circles, calculate length of arcs and area of sectors and segments • Work out upper and lower bounds from a given accuracy, calculate upper and lower bounds of accuracy from calculations • Apply and prove circle theorems • Find the equation of circle with centre (0,0), calculate equations of tangents • Know the difference between sample and population, construct and interpret diagrams for grouped data such as histograms and cumulative frequency diagrams, calculate the mean, mode, median range and interquartile range for grouped and ungrouped data, recognise graphical misrepresentation of data, recognise correlation and interpret in context, construct scatter diagrams and draw lines of best fit • Construct and interpret plans and elevations of simple three-dimension solids • Calculate the volume and surface of prisms, cylinders, cones, spheres, pyramids and composite solids 	
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<p>Summer Term</p>	<ul style="list-style-type: none"> • Congruence • Similarity • Inequalities • Algebraic fractions 	<ul style="list-style-type: none"> • What is congruence? • What information do you need to prove two triangles are congruent? • If a shape has volume 27 times larger, how much larger is its height? • How do you prove two triangles are similar? • Is solving inequalities the same as solving equations, if not what are the differences? • How do you represent an inequality with two variables graphically? • How many integer solutions are there to these three inequalities? • How do you add algebraic fractions? • What do algebraic fractions need for you to be able to simplify them? 	<ul style="list-style-type: none"> • Congruent triangles properties, proof of congruence, • Similarity properties, length, area and volume scale factors, • Inequalities, regions, set notation • Fractions, common denominator, simplify fractions 	<ul style="list-style-type: none"> • Prove triangles are congruent • Prove triangles are similar, understand the relationship between length, area and volume of similar shapes • Solve linear inequalities in one and two variables, solve quadratic inequalities • Simplify and manipulate algebraic fractions 	
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Equipment needed for lessons	How will learning and progress be assessed?
<ul style="list-style-type: none"> • Standard school stationery (Pencil, Blue/Black Pen, Green Pen, Rubber, Sharpener, Ruler, Whiteboard pen) • Exercise book • Scientific Calculator • Pair of Compasses • Protractor 	<ul style="list-style-type: none"> • End of half term tests • Formal assessment week • Peer and self-assessment • Homework tasks • Retrieval practice activities

Extension & Enrichment opportunities	What can you do to support your child?
<ul style="list-style-type: none"> • Intermediate mathematics challenge • External team competitions – Maths Feast • KS4 Puzzle and problem-solving lunchtime club • Puzzle of the week • House mathematics competition 	<ul style="list-style-type: none"> • Several websites are very useful that include videos, questions and walked through examples, these are: mymaths.co.uk, corbettmaths.com, mathsgenie.co.uk and drfrostmaths.com • Encourage regular revision

Inclusion	Inclusion within Y10 Maths
<ul style="list-style-type: none"> • Teachers follow student passports to ensure that the needs of all students with SEND are met. • Work is enlarged to the necessary size for visually impaired students. • Teachers will ensure that classrooms are quiet learning environments where possible and will dim lights to support students with sensory needs. • Students have the use of laptop if they have a SEND need whereby use of a laptop supports them. • Hearing impaired students are supported through use a radio aid and teachers ensure that students can lip read at all times during lessons. • Dyslexic students are encouraged to use coloured overlays when they are required to read long passages. • Use of dyslexic friendly fonts and coloured backgrounds used in PowerPoints/resources. • Students with ADHD are given movement breaks, fidget toys and lessons are 'chunked' to aid concentration. • Students are seated according to their needs, students work with the SENDCo to decide upon this. 	<ul style="list-style-type: none"> • Equipment is adapted wherever necessary to accommodate the needs of students with SEND • Where necessary, pupils are given frequent one to one tutorials to revisit previous topics and methods taught to support their understanding • Pupils are provided with online resources to help with learning outside of the classroom and homework, such as videos and worked examples • Students have access to spare mathematical equipment to help with organisation

If you have any questions about this Learning Overview, please contact the named Teacher above.