Work Hard | Be Kind | Aim High | Show GRIT

Subject: Maths

Year 10: Foundation Year Overview

Unit of Learning	1	2	3	4	5	6
Topic	• Pythagoras • Using a calculator • Trial and Improvement • Rearranging Formulae • Ratio and Proportion 2	• Circles • Probability • Solving Equations • Symmetry • Venn Diagrams and Set Theory	• Angles • 2D and 3D Shapes • Basic Congruence and Similar Shapes • Charts and Diagrams	• Postion, Bearings and Maps • Standard Form • Constructions	• Trigonometry • Coordinates and Linear Graphs • Data Collection and Sampling	• Measures and Compound Units • Real-life Graphs • Volume and Surface Area
To further develop the following skills	• To break down problems into a series of simpler steps. • To develop a rich and accurate mathematical vocabulary. • Present a mathematical justification, argument or proof, making their thinking clear to themselves and others. • To develop connections between knowledge from different topics. • Check their answers are sensible.	• To break down problems into a series of simpler steps. • To develop a rich and accurate mathematical vocabulary. • Present a mathematical justification, argument or proof, making their thinking clear to themselves and others. • To develop connections between knowledge from different topics. • Check their answers are sensible.	• To break down problems into a series of simpler steps. • To develop a rich and accurate mathematical vocabulary. • Present a mathematical justification, argument or proof, making their thinking clear to themselves and others. • To develop connections between knowledge from different topics. • Check their answers are sensible.	• To break down problems into a series of simpler steps. • To develop a rich and accurate mathematical vocabulary. • Present a mathematical justification, argument or proof, making their thinking clear to themselves and others. • To develop connections between knowledge from different topics. • Check their answers are sensible.	• To break down problems into a series of simpler steps. • To develop a rich and accurate mathematical vocabulary. • Present a mathematical justification, argument or proof, making their thinking clear to themselves and others. • To develop connections between knowledge from different topics. • Check their answers are sensible.	• To break down problems into a series of simpler steps. • To develop a rich and accurate mathematical vocabulary. • Present a mathematical justification, argument or proof, making their thinking clear to themselves and others. • To develop connections between knowledge from different topics. • Check their answers are sensible.

	• Apply knowledge to both routine and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others. • Written and oral communication skills.	• Apply knowledge to both routine and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others. • Written and oral communication skills.	• Apply knowledge to both routine and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others. • Written and oral communication skills.	• Apply knowledge to both routine and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others. • Written and oral communication skills.	• Apply knowledge to both routine and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others. • Written and oral communication skills.	• Apply knowledge to both routine and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others. • Written and oral communication skills.
Knowledge	• Use Pythagoras to calculate the length of the hypotenuse. • Use Pythagoras to calculate the length of a shorter side. • Prove a triangle is right-angled. • Find the distance between 2 points. • Use a calculator effectively and efficiently, knowing how to enter a complex calculation correctly. • Understand and interpret the calculator display correctly. • Use trial and improvement methods to solve equations to 1 d.p. • Rearrange formulae that includes brackets,	• Name parts of a circle. • Calculate the circumference and area of a circle given either the radius or the diameter. • Give answers in terms of Π. • Work backwards from the area or circumference to calculate the radius or the diameter. • Calculate arc lengths. • Calculate the area of sectors. • List outcomes systematically to identify all combinations and permutations. • Use the product rule for counting. • Calculate expected frequency. • Find the probability of two	• Calculate interior and exterior angle in regular polygons. • Calculate the number of sides of a polygon using interior and exterior triangles. • Draw and recognise the nets of 3D shapes. • Solve geometric problems on coordinate axes. • Use the geometrical properities of quadrilaterals. • Draw plans and elevations for 3D shapes. • Identifify congruent and similar shapes. • Use similarity to calculate missing lengths and angles. • Understand and use SSS, ASA, SAS and RHS to	• Use a scale on a map. • Understand and use three figure bearings. • Construct scale drawings involving bearings. • Calculate back bearings. • Multiply and divide by powers of 10. • Convert an ordinary number into standard form and vice versa. • Perform calculations with numbers written in standard form. • Order numbers written in standard form. • Accurately construct a triangle given SSS, ASA or SAS. • Construct the perpendicular bisector of a line.	• Correctly label a triangle for trigonometry. • Use trigonometry to calculate the missing length of a triangle. • Use trigonometry to calculate the missing angle of a triangle. • Know the exact trigonometric values for sine and cosine. • Use trigonometry to solve problems involving bearings. • Find the midpoint of a given line segment. • Plot or label horizontal and vertical line s such as y = -4 or x = 2, including y = x and y = -x. • Draw the draws of linear equations in the form y = mx	• Convert between units of length, mass and capacity. • Solve problems involving speed, distance and time. • Perform calculations involving density, mass and volume. • Perform calculations using pressure, force and area. • Uderstand, interpret and describe a real-life graph. • Calculate average speed froma distance-time graph. • Understand which part of the graph represents the fastest and slowest speeds. • Interpret velocity-time graphs. • Match real-life graphs to their

	powers, roots and fractions. • Use ratio to solve worded problems. • Calculate proportional change using a multiplier. • Interpret equations that describe direct and inverse proportion. • Match direct and inverse proportion graphs to their equations.	events happening using sample space diagrams. • Calculate relative frequency. • Consider the differences between theoretical probability and its relative frequency. • Solve equations with unknowns on both sides. • Solve equations involving algebraic fractions. • Problem solve with reflective and rotational symmetry. • Set up and interpret Venn diagrams. • Understand and use basic set theort notation such as P(A∪B), P(A∩B) and P(A)'.	state why two triangles are congruent. • Construct and interpret pie charts. • Construct and interpret stem and leaf diagrams. • Construct and interpret a frequency polygon. • Interpret time series graphs and use to make predictions. •	• Construct an angle bisector. • Constuct angles of 90°, 45° and 60°. • Construct an inscribed regular polygon. • Identify points and regions using loci.	+ c and ax + by = c. • Uderstand and use the gradient of a line. • Write the equation for a given line. • Match graphs to their equations. • Identify parallel lines from their equations. • Write the equation of a parrel line given a gradient and a point. • Expalin the definitions of primary and secondary data. • Explain how to use random sampling. • Expalin the limitations of sampling.	equations or descriptions. • Calculate the volume and surface area of a prism. • Calculate the volume and surface area of a cylinder. • Calculate the volume and surface area of cones, spheres and pyramids. • Calculate missing lengths given volume or surface area. Change between measures of area and volume such as cm^2 to m^2 or m^3 to cm^3.
Assessment	AP1, starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking	QLA, starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking	AP2, starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking	QLA, starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking	AP3, starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking	QLA, starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking
Ecco Values / SMSC / Cultural Capital Links	• Develop team working and leadership skills • Identify and access appropriate	• Develop team working and leadership skills • Identify and access appropriate	• Develop team working and leadership skills • Identify and access appropriate	• Develop team working and leadership skills • Identify and access appropriate	• Develop team working and leadership skills • Identify and access appropriate	• Develop team working and leadership skills • Identify and access appropriate

	advice and support • Empathy • Resilience	advice and support • Empathy • Resilience	advice and support • Empathy • Resilience	advice and support • Empathy • Resilience	advice and support • Empathy • Resilience	advice and support • Empathy • Resilience
Literacy / Numeracy Links	• To develop a rich and accurate mathematical vocabulary. • Reading questions for understanding • High-lighting key words • Written and oral communication skills	• To develop a rich and accurate mathematical vocabulary. • Reading questions for understanding • High-lighting key words • Written and oral communication skills	• To develop a rich and accurate mathematical vocabulary. • Reading questions for understanding • High-lighting key words • Written and oral communication skills	• To develop a rich and accurate mathematical vocabulary. • Reading questions for understanding • High-lighting key words • Written and oral communication skills	• To develop a rich and accurate mathematical vocabulary. • Reading questions for understanding • High-lighting key words • Written and oral communication skills	• To develop a rich and accurate mathematical vocabulary. • Reading questions for understanding • High-lighting key words • Written and oral communication skills

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Subject: Maths

Year 10: Higher Year Overview

Unit of Learning	1	2	3	4	5	6
Topic	• Similarity and Congruency • Transformations • Expanding and factorising • Surds	• Trigonometry • Solving Equations • Probability • Sampling • Simultaneous Equations	• Set Theory • Graphs • Ratio and Proportion	• Cumulative Frequency and Box Plots • Iteration • Solving Quadratic Equations • Circle Theorems	• Histograms • Construction and Loci • Equations of a Circle	• Simultaneous Equations • Sine and Cosine Rules • Compound Units, Speed and real-life Graphs
To further develop the following skills	• To break down problems into a series of simpler steps. • To develop a rich and accurate mathematical vocabulary. • Present a mathematical justification, argument or proof, making their thinking clear to themselves and others. • To develop connections between knowledge from different topics. • Check their answers are sensible. • Apply knowledge to both routine	• To break down problems into a series of simpler steps. • To develop a rich and accurate mathematical vocabulary. • Present a mathematical justification, argument or proof, making their thinking clear to themselves and others. • To develop connections between knowledge from different topics. • Check their answers are sensible. • Apply knowledge to both routine	• To break down problems into a series of simpler steps. • To develop a rich and accurate mathematical vocabulary. • Present a mathematical justification, argument or proof, making their thinking clear to themselves and others. • To develop connections between knowledge from different topics. • Check their answers are sensible. • Apply knowledge to both routine	• To break down problems into a series of simpler steps. • To develop a rich and accurate mathematical vocabulary. • Present a mathematical justification, argument or proof, making their thinking clear to themselves and others. • To develop connections between knowledge from different topics. • Check their answers are sensible. • Apply knowledge to both routine	• To break down problems into a series of simpler steps. • To develop a rich and accurate mathematical vocabulary. • Present a mathematical justification, argument or proof, making their thinking clear to themselves and others. • To develop connections between knowledge from different topics. • Check their answers are sensible. • Apply knowledge to both routine	• To break down problems into a series of simpler steps. • To develop a rich and accurate mathematical vocabulary. • Present a mathematical justification, argument or proof, making their thinking clear to themselves and others. • To develop connections between knowledge from different topics. • Check their answers are sensible. • Apply knowledge to both routine

	and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others. • Written and oral communication skills.	and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others. • Written and oral communication skills.	and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others. • Written and oral communication skills.	and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others. • Written and oral communication skills.	and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others. • Written and oral communication skills.	and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others. • Written and oral communication skills.
Knowledge	• Identify similar and congruent shapes. • Prove two triangles are congruent using ASA, SAS, SSS and RHS. • Use similarity to calculate missing lengths and angles. • Calculate the area and volume scale factors given the length scale factor for similar shapes. • Calculate the area of a 2D shape given the area or lengths of a similar shape. • Perform or describe reflections, rotations and translations. • Enlarge a shape by a negative fractional scale factor from a given point.	• Use trigonometry to calculate missing lengths or angles for a right-angled triangle. • Use trigonometry to solve problems involving bearings. • Use trigonometry to calculate missing lengths and angles in 3D shapes. • Know and use the exact vales for sin, cos and tan. • Solve linear equations with a denominator. • Set up and solve equations linking with many different areas of maths. • Calculate relative frequency. • Compare relative frequency to theoretical probability. • Calculate expected frequency.	• Use the product rule for counting. • Understand and use the concepts of union ∪, intersection ∩ and complement A′. • Set up a Venn diagram. • Calculate probabilities from a Venn diagram, including conditional probabilities. • Draw quadratic graphs. • State the turning point and roots for a quadratic graph. • Solve simultaneous equations graphically involving a quadratic and a linear equation. • Draw cubic, reciprocal and exponential graphs. • Find approximate solutions to	• Cumulative frequency graphs. • Draw a box plot. • Interpret a box plot and know each section represents 25% of the data. • Calculate and interpret outliers and demonstrate them on a box plot. • Use measures of average and spread to compare two sets of data, ensuring statements are put into the context of the data. • Understand the subscript notation in a recursive formulae. • Rearrange an equation to form an iterative formulae. • Use an iterative process to find the solution to an equation to a	• Calculate frequency density from a grouped frequency table. • Construct a histogram with unequal class widths. • Calculate the mean from a histogram. • Calculate probabilities from a histogram. • Accurately construct triangle given SAS, ASA and SSS. • Construct the perpendicular and angle bisectors. • Construct angles of size 60°, 90° and 45°. • Know how to construct the locus of a point that remains a fixed distance from a point or a line. • Know how to construct the locus of a point	• Solve linear simultaneous equations. • Solve a pair of simultaneous equations where one is linear and the other is quadratic. • Solve a pair of simultaneous equations where one is linear and the other is a circle. • Form and solve simultaneous equations for worded and geometrical problems. • Revisit Pythagoras and trigonometry. • Trigonometry and Pythagoras in 3D. • Use the sine rule to calculate missing angles and lengths. • Use the cosine rule to calculate missing angles and lengths.

	• Understand and use the term invariance for points, lines and shapes with transformations. • Transform a shape by a combination of transformations. • Expand triple brackets. • Factorise quadratics with an x^2 coefficient greater than 1. • Solve a quadratic equation by factorisation. • Form and solve quadratic equations for given situations. • Simplify a surd. • Perform the four operations with surds. • Expand brackets involving surds. • Factorise an expression involving surds. • Rationalise the denominator.	• Calculate probabilities of combined events. • Use a tree diagram to calculate the probability of successive events. • Use tree diagrams to calculate conditional probabilities. • Understand and use the terminology of sampling. • Infer properties of a population from a sample. • Peterson capture-recapture method. • Solve simultaneous equations algebraically. • Solve simultaneous equations graphically. • Set up and solve simultaneous equations to solve worded or geometrical problems.	equations from their graphs. • Solve direct proportion problems, including those with squared, square-roots and cubes. • Solve inverse proportion problems, including those with squared and square-roots. • Interpret and sketch a graph that illustrates direct and indirect proportion. • Sketch and recognise an appropriate shaped graph to represent a real-life situation.	given degree of accuracy. • Understand the concept of convergent, divergent and oscillating outcomes. • Use a quadratic graph to solve an equation. • Solve quadratics by factorisation. • Use the quadratic formula to solve a quadratic equation. • Complete the square of a quadratic equation. • Solve quadratic equations by completing the square. • Use completing the square to find the turning point. • Use circle theorems to solve problems.	equidistant from 2 points or 2 lines. • Use constructions to solve multi step loci problems. • Recognise the equation of a circle with centre (0,0) and radius r. • Write down the equation of a circle with centre (0,0). • Show whether a point lies on, inside or outside a given circle. • Estimate the gradient of a curve at a given point by drawing a tangent and calculating the gradient of the straight line. • Find the equation of a tangent to a circle at a given point.	• Solve problems involving the sine rule, the cosine rule and bearings. • Solve area problems using 0.5absinC. • Draw a distance-time graph. • Calculate average speed for a distance-time graph. • Use speed to calculate distance or time. • Discuss acceleration for a time-distance graph or a speed-time graph. • Convert fluently between metric compound units e.g. metres/second into km/hour. • Solve problems involving density and pressure. • Calculate the gradient of a straight line. • Know the gradient represents speed for a distance-time graph and acceleration for a speed-time graph.
Assessment	AP1, starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking	QLA, starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking	AP2, starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking	QLA, starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking	AP3, starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking	QLA, starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking

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