Subject: Maths

Year 8: Foundation Year Overview

Unit of Learning	1	2	3	4	5	6
Topic	• Calculations • Types of Number • Laws of Indices • Standard Form	• Algebraic Manipulation • Angles • Construction • Bearings	• Fractions • Percentages • FDP • Linear Graphs	• Circles • Pythagoras • Volume and Surface Area • Graphs	• Ratio and Proportion • Similar Shapes • Congruent Shapes • Transformations	• Equations and Inequalities • Simultaneous equations • Speed and Density
To lay the fundamental building blocks for 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 and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others. • Written and oral communication 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 and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others • Written and oral communication 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 and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others • Written and oral communication 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 and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others. • Written and oral communication 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 and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others. • Written and oral communication 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 and non-routine problems. • Fluent application of arithmetic. • The ability to work alone or to collaborate with others. • Written and oral communication skills.

Knowledge						
• Problem solve with directed numbers. • Use written methods for the four operations on decimals. • Use BIDMAS to complete complex calculations. • Problem solve with squares, cubes and primes. • Use the very basic rules of surds. • Perform calculations involving factors, multiples and primes. • Use Venn diagrams to calculate the HCF and LCM of 2 or 3 numbers. • Calculate the reciprocal of any given number. • Understand and use index notation. • Use the basic laws of indices. • Begin to make the link between reciprocals and negative indices. • Write numbers in standard form and vice versa. • Compare the size of numbers written in standard form.	• Write a formula or equation for a given situation. • Substitute values into linear and quadratic expressions. • Expand singles brackets and add or subtract the resulting expressions. • Expand double brackets. • Rearrange formulae. • Solve equations with unknowns on both sides. • Factorise algebraic expressions. • Identify alternate, corresponding and co-interior angles. • Solve complex angle problems using angles made with parallel lines. • Calculate interior and exterior angles of a polygon. • Construct triangles using a ruler, a compass and a protractor. • Construct the perpendicular and angle bisectors. • Draw and measure bearings. • Draw plans and elevations. • Form and solve equations using angle rules.	• Write fractions in order of size. • Write a mix of fractions, decimals and percentages in order of size. • Perform the four operations with mixed numbers. • Use multipliers to calculate percentages. • Increase or decrease an amount by a given percent. • Calculate a change in quantities as a percentage change. • Plot coordinates in all 4 quadrants. • Use a table to draw the graph of a linear function. • Understand the definition of gradient and y-intercept. • State the gradient and y-intercept for a linear function from its equation. • Rearrange a linear equation into the form $y = mx + c$ • State the equation of a given line. • Use the gradient and y-intercept to draw the graph of a linear function.	• Label parts of a circle. • Calculate the area or circumference of a circle given the length of the radius or diameter. • Gives answers both numerically and in terms of π. • Calculate the radius or diameter given the area or circumference. • Use Pythagoras' theorem to calculate the length of the hypotenuse. • Use Pythagoras' theorem to calculate the length of a shorter side. • Calculate the volume and surface area of prisms. • Calculate the volume and surface area of a cylinder. • Create a two-way table for a worded problem. • Discuss the advantages and disadvantages of each type of average. • Draw and interpret scatter diagrams. • Draw and interpret pie charts. • Discuss how diagrams can be used to mislead.	• Simplify a ratio using decimals, fractions or different units. • Convert currencies. • Use ratio to convert measures of length, mass and capacity. • Use a ratio to find a missing quantity when given one of the amounts and the ratio • Use ratio to calculate missing amounts when given the differences in quantities. • Solve problems with ratio that include fractions. • Use a unit ratio with recipe problems. • Solve best buy problems. • Identify graphs of direct proportion. • Perform calculations with similar shapes. • Identify congruent shapes. • Perform and describe the four types of transformation: translation, rotation, reflection and enlargement.	• Substitute values into expressions and formulae. • Solve multistep equations. • Solve quadratics in the form of $x^2 + a = b$. • Solve equations involving an algebraic fraction. • Solve a linear inequality. • Represent an inequality on a number line. • List the integers satisfied by an inequality. • Explain what happens when an inequality is multiplied or divided by a negative. • Solve simple simultaneous equations. • Calculate speed given distance and time. • Calculate the distance travelled given speed and time. • Calculate the time taken given speed and distance. • Draw and interpret a distance time graph. • Convert units of speed, e.g. m/min to km/hour. • Calculate the density of an object. • Use density to calculate mass or volume. • Plot and use conversion graphs.

Assessment	Starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking	AP1, starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking	AP2, QLA, 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, self-assessment, home works, questioning, live marking	QLA, starters, AfL, self-assessment, home works, questioning, live marking
Ecco Values / SMSC / Cultural Capital Links	• Develop team working and leadership skills • Identify and access appropriate advice and support • Empathy • Resilience	• Develop team working and leadership skills • Identify and access appropriate advice and support • Empathy • Resilience	• Develop team working and leadership skills • Identify and access appropriate advice and support • Empathy • Resilience	• Develop team working and leadership skills • Identify and access appropriate advice and support • Empathy • Resilience	• Develop team working and leadership skills • Identify and access appropriate advice and support • Empathy • Resilience	• Develop team working and leadership skills • Identify and access appropriate 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 8: Higher Year Overview

Unit of Learning	1	2	3	4	5	6
Topic	• Number skills and Accuracy • Fractions, decimals and percentages	• Linear and non-linear graphs • 2D and 3D shapes	• Standard Form • Quadratic Equations	• Constructions and loci • Collecting and Analysing Data	• Ratio and Proportion • Similarity and Congruence	• Compound Measure • Pythagoras and Trigonometry
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Knowledge						
	• Use mental and written methods for calculating with all operations • Identify and use square and cube numbers • Simplify surds • Simplify indices including negative and fractional • Continue to work on rounding and estimation • Calculate with upper and lower bounds • Find HCF and LCM using prime factors • Convert between fractions, decimals and percentages • Calculate with mixed numbers • Increase and decrease an amount by a given percentage using multipliers • Solve problems involving reverse percentages • Calculate simple interest • Convert recurring decimals to fractions	• Identify vertical, horizontal lines and the line y=x, y=-x • Generate coordinates for and plot linear and quadratic graphs • Find the midpoint of any given line • Identify the gradient and y intercept of a straight line • Find the equation of a straight line • Find the equation of lines parallel and perpendicular to a given line • Identify reciprocal and cubic graphs • Continue work on area and perimeter of 2D shapes • Continue to work on volume and surface area of 3D shapes • Calculate the volume of a pyramid, cone and sphere • Calculate areas and volumes involving different units	• Recap index rules • Continue to work with negative and fractional indices • Write both large and small numbers in standard form • Convert standard form back into ordinary numbers • Calculate using numbers written in standard form • Compare numbers written in standard form • Solve linear equations • Expand single and double brackets • Factorise quadratic expressions into double brackets • Solve quadratic equations by factorising • Find the nth term rule for quadratic expressions	• Draw plan and elevations of 3D shapes • Draw a 3D shape from its plan and elevations • Use ruler and compass to construct line and angle bisectors • Accurately construct triangles using mathematical equipment • Use constructions to solve loci problems • Draw and measure bearings • Draw and interpret scale drawings • Calculate averages and range from a set of data and frequency tables • Use averages and range to compare two data sets • Draw and interpret statistical diagrams • Use statistical diagrams to compare sets of data • Identify a sample from a population	• .Continue to work on writing and simplifying ratio • Continue work on using ratio to solve problems • Write a ratio as a unit ratio and use it to solve proportion problems • Use ratio equivalence to solve more complicated problems • Identify when something is directly or inversely proportional • Set up and solve algebraic equations to solve proportion problems • Define and identify when a shape similar or congruent • Prove congruence • Use similarity to find length, area and volume of any similar shape	• Convert time between hours and minutes • Calculate speed, distance and time • Interpret distance time graphs • Convert compound units • Calculate density, mass and volume • Calculate pressure, force and area • Plot and interpret a conversion graph • Know and use Pythagoras' theorem to calculate missing lengths • Identify trigonometric ratios • Use trigonometric ratios to calculate missing lengths and angles in right angled triangles
Assessment	Starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking	AP1, starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking	AP2, QLA, 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, self-assessment, home works, questioning, live marking	QLA, starters, AfL, self-assessment, home works, questioning, live marking

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