# Subject: Maths

# Year 7: Foundation Year Overview

| Unit of Learning | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **Topic** | • Calculations<br>• Types of Number<br>• Rounding<br>• Decimals | • Perimeter<br>• Area<br>• Algebraic Manipulation | • Fractions, decimals and percentages.<br>• Displaying and analysing data. | • Ratio and Proportion<br>• Angles | • Sequences<br>• Probability | • Transformations<br>• 3D Shapes |
| **To begin to lay the fundamental building blocks for the following skills** | • To break down problems into a series of simpler steps.<br>• To develop a rich and accurate mathematical vocabulary.<br>• Present a mathematical justification, argument or proof, making their thinking clear to themselves and others.<br>• To develop connections between knowledge from different topics.<br>• Check their answers are sensible.<br>• Apply knowledge to both routine and non-routine problems.<br>• Fluent application of arithmetic.<br>• The ability to work alone or to collaborate with others.<br>• Written and oral communication skills. | • To break down problems into a series of simpler steps.<br>• To develop a rich and accurate mathematical vocabulary.<br>• Present a mathematical justification, argument or proof, making their thinking clear to themselves and others.<br>• To develop connections between knowledge from different topics.<br>• Check their answers are sensible.<br>• Apply knowledge to both routine and non-routine problems.<br>• Fluent application of arithmetic.<br>• The ability to work alone or to collaborate with others.<br>• Written and oral communication skills. | • To break down problems into a series of simpler steps.<br>• To develop a rich and accurate mathematical vocabulary.<br>• Present a mathematical justification, argument or proof, making their thinking clear to themselves and others.<br>• To develop connections between knowledge from different topics.<br>• Check their answers are sensible.<br>• Apply knowledge to both routine and non-routine problems.<br>• Fluent application of arithmetic.<br>• The ability to work alone or to collaborate with others.<br>• Written and oral communication skills. | • To break down problems into a series of simpler steps.<br>• To develop a rich and accurate mathematical vocabulary.<br>• Present a mathematical justification, argument or proof, making their thinking clear to themselves and others.<br>• To develop connections between knowledge from different topics.<br>• Check their answers are sensible.<br>• Apply knowledge to both routine and non-routine problems.<br>• Fluent application of arithmetic.<br>• The ability to work alone or to collaborate with others.<br>• Written and oral communication skills. | • To break down problems into a series of simpler steps.<br>• To develop a rich and accurate mathematical vocabulary.<br>• Present a mathematical justification, argument or proof, making their thinking clear to themselves and others.<br>• To develop connections between knowledge from different topics.<br>• Check their answers are sensible.<br>• Apply knowledge to both routine and non-routine problems.<br>• Fluent application of arithmetic.<br>• The ability to work alone or to collaborate with others.<br>• Written and oral communication skills. | • To break down problems into a series of simpler steps.<br>• To develop a rich and accurate mathematical vocabulary.<br>• Present a mathematical justification, argument or proof, making their thinking clear to themselves and others.<br>• To develop connections between knowledge from different topics.<br>• Check their answers are sensible.<br>• Apply knowledge to both routine and non-routine problems.<br>• Fluent application of arithmetic.<br>• The ability to work alone or to collaborate with others.<br>• Written and oral communication skills. |

| Knowledge | | | | | | |
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| | • Written methods for multiplying, dividing, adding and subtracting.<br>• Build upon and extend knowledge and use of place value.<br>• Problem solve with directed numbers.<br>• Use function machines.<br>• Work with square, cube and prime numbers.<br>• Calculate and problem solve with HCF and LCM.<br>• Use BIDMAS for all operations.<br>• Round numbers to any given level of accuracy.<br>• Perform calculations with decimals.<br>• Convert metric measures to other metric measures. | • Use the properties of quadrilaterals and triangles.<br>• Work with lines of symmetry and rotational symmetry<br>• Calculate the area and perimeter of compound shapes.<br>• Find missing dimensions given an area or perimeter.<br>• Write a perimeter or area as an algebraic expression.<br>• Define and identify terms, expressions, equations, formulae and identities.<br>• Simplify algebraic expressions.<br>• Substitute positive and negative values into algebraic expressions.<br>• Solve basic equations.<br>• Expand a single bracket.<br>• Factorise a simple expression. | • Order numbers written in different formats.<br>• Compare the size of fractions.<br>• Perform the four operations with fractions.<br>• Convert between fractions, decimals and percentages.<br>• Calculate fractions of an amount.<br>• Calculate percentages with and without a calculator.<br>• Record data from an experiment.<br>• Draw and interpret diagrams.<br>• Calculate averages and range.<br>• Compare data sets using averages and spread.<br>• Identify and explain which the best average to use is.<br>• Draw and interpret pie charts.<br>• Draw and interpret Venn diagrams. | • Write a ratio for a given situation.<br>• Write a ratio as a fraction.<br>• Write and use unit ratios.<br>• Use proportion to solve recipe problems.<br>• Share an amount by a ratio.<br>• Problem solve with ratio.<br>• Use a protractor to accurately measure angles.<br>• Work with parallel and perpendicular lines.<br>• Use standard conventions for labelling sides and angles.<br>• Problem solve with the basic angle rules (vertically opposite, angles on straight line, angles in a triangle, and angles in a quadrilateral).<br>• Calculate the interior angles of a polygon. | • Identify and continue a picture, an arithmetic or geometric sequence.<br>• Identify and continue a Fibonacci type sequence.<br>• Find missing terms in a sequence.<br>• Find the nth term for a numerical sequence.<br>• Find the nth term for a picture sequence.<br>• Generate a sequence from the nth term.<br>• Place events onto a probability scale.<br>• Record, describe and analyse the frequency of an experiment.<br>• Calculate the probability of an event happening.<br>• Calculate the probability of an event not happening.<br>• Calculate probability from a Venn diagram or two-way table.<br>• Draw and use a frequency tree. | • Understand and use similar shapes.<br>• Understand and use congruent shapes.<br>• Know the link between similar shapes and congruent shapes with the objects and images of transformations.<br>• Perform and describe translations using words and column vectors.<br>• Perform and describe rotations.<br>• Name and draw vertical and horizontal lines on a graph.<br>• Perform and describe reflections.<br>• Perform and describe enlargements using positive integer scale factors.<br>• Calculate the area and perimeter of 2D shapes.<br>• Name 3D shapes.<br>• Draw and identify nets of 3D shapes.<br>• Calculate the volume and surface area of a prism.<br>• Convert between units of length area and volume. |
| Assessment | 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 | Starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking | Starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking | Starters, AfL, self-assessment, home works, questioning, live marking | AP3, QLA, starters, AfL, self-assessment, home works, questioning, live marking |

| Ecco Values / SMSC / Cultural Capital Links | • Develop team working and leadership skills<br>• Identify and access appropriate advice and support<br>• Empathy<br>• Resilience | • Develop team working and leadership skills<br>• Identify and access appropriate advice and support<br>• Empathy<br>• Resilience | • Develop team working and leadership skills<br>• Identify and access appropriate advice and support<br>• Empathy<br>• Resilience | • Develop team working and leadership skills<br>• Identify and access appropriate advice and support<br>• Empathy<br>• Resilience | • Develop team working and leadership skills<br>• Identify and access appropriate advice and support<br>• Empathy<br>• Resilience | • Develop team working and leadership skills<br>• Identify and access appropriate advice and support<br>• Empathy<br>• Resilience |
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| Literacy / Numeracy Links | • To develop a rich and accurate mathematical vocabulary.<br>• Reading questions for understanding<br>• High-lighting key words<br>• Written and oral communication skills | • To develop a rich and accurate mathematical vocabulary.<br>• Reading questions for understanding<br>• High-lighting key words<br>• Written and oral communication skills | • To develop a rich and accurate mathematical vocabulary.<br>• Reading questions for understanding<br>• High-lighting key words<br>• Written and oral communication skills | • To develop a rich and accurate mathematical vocabulary.<br>• Reading questions for understanding<br>• High-lighting key words<br>• Written and oral communication skills | • To develop a rich and accurate mathematical vocabulary.<br>• Reading questions for understanding<br>• High-lighting key words<br>• Written and oral communication skills | • To develop a rich and accurate mathematical vocabulary.<br>• Reading questions for understanding<br>• High-lighting key words<br>• Written and oral communication skills |

# Work Hard | Be Kind | Aim High | Show GRIT

# Subject: Maths

## Year 7: Higher Year Overview

| Unit of Learning | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **Topic** | • Number skills<br>• Fractions and Decimals | • Perimeter, Area and Volume<br>• Algebraic Manipulation | • Percentages<br>• Displaying and Analysing Data | • Ratio and Proportion<br>• Angles and Polygons | • Sequences<br>• Probability | • Transformations<br>• Equations and Inequalities |
| **To begin to lay the fundamental building blocks for the following skills** | • To break down problems into a series of simpler steps.<br>• To develop a rich and accurate mathematical vocabulary.<br>• Present a mathematical justification, argument or proof, making their thinking clear to themselves and others.<br>• To develop connections between knowledge from different topics.<br>• Check their answers are sensible.<br>• Apply knowledge to both routine and non-routine problems.<br>• Fluent application of arithmetic.<br>• The ability to work alone or to collaborate with others.<br>• Written and oral communication skills. | • To break down problems into a series of simpler steps.<br>• To develop a rich and accurate mathematical vocabulary.<br>• Present a mathematical justification, argument or proof, making their thinking clear to themselves and others.<br>• To develop connections between knowledge from different topics.<br>• Check their answers are sensible.<br>• Apply knowledge to both routine and non-routine problems.<br>• Fluent application of arithmetic.<br>• The ability to work alone or to collaborate with others.<br>• Written and oral communication skills. | • To break down problems into a series of simpler steps.<br>• To develop a rich and accurate mathematical vocabulary.<br>• Present a mathematical justification, argument or proof, making their thinking clear to themselves and others.<br>• To develop connections between knowledge from different topics.<br>• Check their answers are sensible.<br>• Apply knowledge to both routine and non-routine problems.<br>• Fluent application of arithmetic.<br>• The ability to work alone or to collaborate with others.<br>• Written and oral communication skills. | • To break down problems into a series of simpler steps.<br>• To develop a rich and accurate mathematical vocabulary.<br>• Present a mathematical justification, argument or proof, making their thinking clear to themselves and others.<br>• To develop connections between knowledge from different topics.<br>• Check their answers are sensible.<br>• Apply knowledge to both routine and non-routine problems.<br>• Fluent application of arithmetic.<br>• The ability to work alone or to collaborate with others.<br>• Written and oral communication skills. | • To break down problems into a series of simpler steps.<br>• To develop a rich and accurate mathematical vocabulary.<br>• Present a mathematical justification, argument or proof, making their thinking clear to themselves and others.<br>• To develop connections between knowledge from different topics.<br>• Check their answers are sensible.<br>• Apply knowledge to both routine and non-routine problems.<br>• Fluent application of arithmetic.<br>• The ability to work alone or to collaborate with others.<br>• Written and oral communication skills. | • To break down problems into a series of simpler steps.<br>• To develop a rich and accurate mathematical vocabulary.<br>• Present a mathematical justification, argument or proof, making their thinking clear to themselves and others.<br>• To develop connections between knowledge from different topics.<br>• Check their answers are sensible.<br>• Apply knowledge to both routine and non-routine problems.<br>• Fluent application of arithmetic.<br>• The ability to work alone or to collaborate with others.<br>• Written and oral communication skills. |

| Knowledge | | | | | | |
|---|---|---|---|---|---|---|
| | • Use mental and written methods of calculation with integers and decimals for all operations<br>• Convert metric measures<br>• Identify squares, cubes, roots, factors, multiples and prime numbers<br>• Use BIDMAS in all calculations<br>• Round numbers and use estimations to check answers<br>• Calculate HCF and LCM using both methods<br>• Simplify expressions using index laws<br>• Identify equivalent fractions<br>• Calculate with fractions using all operations<br>• Write decimals in order of size<br>• Convert between fractions and decimals<br>• Identify recurring decimals as fractions | • Name and identify 2D and 3D shapes<br>• Calculate the perimeter and area of 2D shapes<br>• Find missing dimensions given an area or perimeter<br>• Name and identify all of the parts of a circle<br>• Calculate the area and circumference of a circle<br>• Calculate the volume and surface area of 3D shapes<br>• Convert between measures of area and volume<br>• Define and identify the terms expression, equation, formula and identity<br>• Simplify algebraic expressions<br>• Substitute values into an algebraic expression<br>• Expand single brackets<br>• Rearrange equations<br>• Factorise linear expressions<br>• Solve basic algebraic equations<br>• | • Convert between fractions, decimals and percentages<br>• Calculate percentages of an amount<br>• Increase and decrease an amount by a given percentage<br>• Calculate percentage change<br>• Solve problems involving reverse percentage<br>• Write a mix of fractions, decimals and percentages in order of size<br>• Construct and analyse frequency charts<br>• Calculate the mean, median, mode and range from a set of data<br>• Understand when it is appropriate to use each average<br>• Draw and interpret scatter graphs<br>• Draw and interpret pie charts<br>• Identify misleading graphs | • Write and simplify ratios<br>• Use ratios to solve problems<br>• Use ratio to convert measures and currencies<br>• Share an amount into a given ratio<br>• Solve proportion problems using ratio<br>• Identify best buys using ratio<br>• Draw and measure angles<br>• Use angle rules to calculate missing angles<br>• Use parallel line rules to find missing angles<br>• Draw and measure bearings | • Identify a sequence and work out the next term<br>• Generate a sequence from a term to term rule<br>• Generate a linear and quadratic sequence from the $n^{th}$ term rule<br>• Find the nth term rule for a given sequence<br>• Use the $n^{th}$ term rule to prove whether a number is in a given sequence<br>• Generate coordinates for linear and quadratic graphs<br>• Plot coordinates onto a set of axes<br>• Use the appropriate language for probability<br>• Calculate probabilities<br>• Draw diagrams and use them to calculate probabilities | • Perform transformations of shapes including rotation, reflection, translation and enlargement<br>• Describe a given transformation<br>• Name the equations of vertical and horizontal lines on a graph<br>• Solve more complex linear algebraic equations<br>• Simplify and calculate with algebraic fractions<br>• Identify the integers satisfied by a given inequality<br>• Draw an inequality on a number line<br>• Solve an inequality<br>• Solve simultaneous equations |
| **Assessment** | 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 | Starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking | Starters, AfL, progress checkers, self and peer feedback, home works, questioning, live marking | Starters, AfL, self-assessment, home works, questioning, live marking | AP3, QLA, starters, AfL, self-assessment, home works, questioning, live marking |

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