# Maths
# Key Stage 3 Framework for Learning
## Year 7 2017-2018: Future Foundations

## First 3 weeks

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| **Knowledge** | Cosmic<br>**Number: Place value**<br>Understand and use place value for decimals, measures and integers of any size.<br>Order positive and negative integers, use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥ |
| **Skills** | • Ordering numbers<br>• Use of mathematical symbols<br>• Problem Solving |
| **Assessment** | |
| **Cultural enrichment** | |
| **Character** | |

## Autumn 1

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| **Knowledge** | **Number –**<br>**Place value**<br>Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]<br><br>**Number- Addition & subtraction**<br>Use formal written methods for addition and subtraction of integers and decimals.<br>Recognise and use relationships between addition and subtraction including inverse operations.<br>Calculate and solve problems involving perimeter. |
| **Skills** | • Addition<br>• Subtraction<br>• Estimation<br>• Rounding<br>• Problem Solving |
| **Assessment** | *Marking Point 1*<br>Week 1/2 - This will be a significant piece of work in their exercise book (highlighted by coloured paper) – feedback will be given in the form of two stars and a wish.<br><br>*Marking Point 2*<br>Week 2/3 Students will be assessed on their written piece of homework Feedback will be given in their books in the form of two stars and a wish.<br><br>*Marking Point 3*<br>Week 5/6 - students will undertake a topic review test for Addition, Subtraction and problem solving. This will cover the key content as outlined in the knowledge section above. Students will be given feedback in the form of two stars and a wish. |
| **Cultural enrichment** | There is a Maths leaders club that runs every Tuesday night. This involves puzzles, games and critical thinking skills.<br><br>Home learning will encourage pupils to develop their cultural enrichment, by researching key elements of the course. This aims to inspire curiosity and develop communication skills for future class discussion. |
| **Character** | <br>QofS – Optimism |

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| | • **Optimism** – Lots of questions at different levels, enabling students to challenge themselves by moving onto harder questions independently.<br>• **Optimism** – make students aware, through a skills ladder, of the learning journey. Understanding that the skills based topics have to be applied in order to achieve higher order thinking questions, which will show that pupils are optimistic about their learning. |

## Autumn 2

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| Knowledge | **Number – Multiplication & division**<br><br>Multiply and divide by 10, 100 and 1000.<br>Use formal written methods for multiplication and division of integers and decimals.<br>Recognise and use relationships between operations including inverse operations.<br>Understand the order of operations.<br>Use the concepts and vocabulary of prime numbers, factors (or divisors), common factors and highest common factor (HCF).<br>Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations.<br>Find the prime factor decomposition of a number.<br>Calculate and solve problems involving area of rectangles, triangles and parallelograms.<br>Calculate the mean average.<br>Use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation $a<x\leq b$ |
| Skills | • Multiplication<br>• Division<br>• Problem Solving |
| Assessment | *Marking Point 1*<br>Week 1/2 - This will be a significant piece of work in their exercise book (highlighted by coloured paper) – feedback will be given in the form of two stars and a wish.<br><br>*Marking Point 2*<br>Week 2/3 Students will be assessed on their written piece of homework Feedback will be given in their books in the form of two stars and a wish.<br><br>*Marking Point 3*<br>Week 5/6 - students will undertake a Progress Test that will encompass everything covered in the Autumn Term. Students will be given feedback in the form of two stars and a wish. |
| Cultural enrichment | There is a Maths leaders club that runs every Tuesday night. This involves puzzles, games and critical thinking skills.<br><br>Home learning will encourage pupils to develop their cultural enrichment, by researching key elements of the course. This aims to inspire curiosity and develop communication skills for future class discussion. |
| Character | QofS – Empathy<br><br>• **Empathy** – Ask The Expert - students can be provided with a mixture of questions to practise by nominating an expert in each field to teach other groups. Plenty of opportunity for peer and self-assessment throughout all topics. |

## Spring 1

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| Knowledge | **Number: Fractions 1**<br>Represent fractions using diagrams and on a number line.<br>Express one quantity as a fraction of another.<br>Identify and use equivalent fractions.<br>Compare and order fractions; use the symbols =, ≠, <, >, ≤, ≥<br>Convert between mixed numbers and improper fractions.<br>Simplify fractions.<br><br>Convert between fractions and decimals<br>-Tenths, hundredths, thousandths |

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| | -Associating a fraction with division to convert any fraction to a decimal.<br><br>Use the concepts and vocabulary of multiples and lowest common multiple (LCM).<br><br>Add and subtract any fraction.<br>-Fractions with the same denominator.<br>-Fractions with a denominator that is a multiple of the other.<br>-Fractions with different denominators<br><br>Find a fraction of an amount. |
| **Skills** | • Recognising different shapes<br>• Recognising parts of shapes<br>• Division<br>• Multiplication<br>• Addition<br>• Problem Solving |
| **Assessment** | *Marking Point 1*<br>Week 1/2 - This will be a significant piece of work in their exercise book (highlighted by coloured paper) – feedback will be given in the form of two stars and a wish.<br><br>*Marking Point 2*<br>Week 2/3 Students will be assessed on their written piece of homework Feedback will be given in their books in the form of two stars and a wish.<br><br>*Marking Point 3*<br>Week 5/6 - students will undertake a topic review test for Fractions and problem solving. This will cover the key content as outlined in the knowledge section above. Students will be given feedback in the form of two stars and a wish. |
| **Cultural enrichment** | There is a Maths leaders club that runs every Tuesday night. This involves puzzles, games and critical thinking skills.<br><br>Home learning will encourage pupils to develop their cultural enrichment, by researching key elements of the course. This aims to inspire curiosity and develop communication skills for future class discussion. |
| **Character** | QofS – Creativity & Curiosity<br><br>• **Creativity** – Students can demonstrate creativity with a series of questioning/describing tasks. This can involve representing fractions in as many different possible ways.<br>•<br>**Curiosity** – large number of opportunities for investigative tasks; measuring (both interior and exterior) angles of various shapes and deducing general rules. |

## Spring 2

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| **Knowledge** | **Statistics 1**<br>Understand the data handling cycle.<br>Understand the different types of data.<br><br>Collect, organise and interpret data.<br>-Tally charts<br>-Two way tables<br>-Median, mode and range<br>-Consider outliers<br><br>Draw and interpret bar charts, pictograms and line graphs.<br><br>**Number: Negative numbers**<br>Use the four operations with negative numbers.<br>Understand the order of operations. |

| Skills | <ul><li>Reading graphs</li><li>Interpreting data</li><li>Problem Solving</li></ul> |
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| Assessment | *Marking Point 1*<br>Week 1/2 - This will be a significant piece of work in their exercise book (highlighted by coloured paper) – feedback will be given in the form of two stars and a wish.<br><br>*Marking Point 2*<br>Week 2/3 Students will be assessed on their written piece of homework Feedback will be given in their books in the form of two stars and a wish.<br><br>*Marking Point 3*<br>Week 5/6 - students will undertake a Progress Test that will encompass everything covered in the Autumn and Spring Terms. Students will be given feedback in the form of two stars and a wish. |
| Cultural enrichment | There is a Maths leaders club that runs every Tuesday night. This involves puzzles, games and critical thinking skills.<br><br>Home learning will encourage pupils to develop their cultural enrichment, by researching key elements of the course. This aims to inspire curiosity and develop communication skills for future class discussion. |
| Character | QofS – Responsibility & Reflection<ul><li>**Reflection** – large number of opportunities for peer assessment contained within topics.</li><li>**Reflection** - Can students use mathematical symbols to describe a scenario? e.g. Emma has x sweets, Pete has five more than Emma, write an expression for the number of sweets Pete has.</li></ul> |

# Summer 1

| Knowledge | **Algebra 1**<br>**Introduction to algebra**<br>Understand that a letter represents a variable.<br>Understand the difference between an expression, equation, formula, term, function and identity.<br>Form expressions from situations describes in words.<br><br>Use and interpret algebraic notation, including:<br>-ab in place of $a \times b$<br>-3y in place of $y + y + y$ and $3 \times y$<br>-a2 in place of $a \times a$, a3 in place of $a \times a \times a$; a2b in place of $a \times a \times b$<br>-$ba$ in place of $b \div a$<br>-coefficients written as fractions rather than as decimals<br>-brackets<br><br>Substitute numerical values into formulae and expressions, including scientific formulae. (including examples with negatives)<br><br>Simplify and manipulate algebraic expressions to maintain equivalence by:<br>-collecting like terms.<br><br>Use algebraic methods to solve simple linear equations in one variable where the unknown appears on one side of the equation. Generate terms of a sequence from either a term-to-term. |
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| Skills | <ul><li>Pattern recognition</li><li>Substitution</li><li>Multiplication</li><li>Division</li><li>Addition</li><li>Subtraction</li></ul> |
| Assessment | *Marking Point 1*<br>Week 1/2 - This will be a significant piece of work in their exercise book (highlighted by coloured paper) – feedback will be given in the form of two stars and a wish.<br><br>*Marking Point 2* |

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| | Week 2/3 Students will be assessed on their written piece of homework Feedback will be given in their books in the form of two stars and a wish.<br><br>*Marking Point 3*<br>Week 5/6 - students will undertake a topic review test for Algebra and problem solving. This will cover the key content as outlined in the knowledge section above. Students will be given feedback in the form of two stars and a wish. |
| **Cultural enrichment** | There is a Maths leaders club that runs every Tuesday night. This involves puzzles, games and critical thinking skills.<br><br>Home learning will encourage pupils to develop their cultural enrichment, by researching key elements of the course. This aims to inspire curiosity and develop communication skills for future class discussion. |
| **Character** | <br><br>QofS – Practice & Resiliency<br>• **Practice** – lots of opportunities to practise conversions between fractions, decimals and percentages through interactive activities.<br>• **Resiliency** –Algebra is a difficult topic to master and questions can be posed in many guises. Students must develop their resiliency through problem solving exercises.<br><br>**Resiliency** –Can students use mathematical symbols to describe a scenario? e.g. Emma has x sweets, Pete has five more than Emma, write an expression for the number of sweets Pete has. |

## Summer 2

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| **Knowledge** | **Geometry – Lines & angles**<br>Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric.<br>Derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies<br>Use a protractor to measure and draw angles.<br>Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles.<br>Understand and use alternate and corresponding angles on parallel lines.<br>Derive and use the sum of angles in a triangle and a quadrilateral.<br>Derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons. |
| **Skills** | • Recognising angles<br>• Using a protractor<br>• Problem Solving |
| **Assessment** | *Marking Point 1*<br>Week 1/2 - This will be a significant piece of work in their exercise book (highlighted by coloured paper) – feedback will be given in the form of two stars and a wish.<br><br>*Marking Point 2*<br>Week 2/3 Students will be assessed on their written piece of homework Feedback will be given in their books in the form of two stars and a wish.<br><br>*Marking Point 3*<br>Week 5/6 - students will undertake a Progress Test that will encompass everything covered in the entire academic year. Students will be given feedback in the form of two stars and a wish. |
| **Cultural enrichment** | There is a Maths leaders club that runs every Tuesday night. This involves puzzles, games and critical thinking skills.<br><br>Home learning will encourage pupils to develop their cultural enrichment, by researching key elements of the course. This aims to inspire curiosity and develop communication skills for future class discussion. |
| **Character** |  |

QofS – Motivation

- **Motivation** – Geometry range from being very simple to very complex. By students understanding the learning journey for this topic, this provides motivation for their achievement.