




## Maths

### Key Stage 3 Framework for Learning

Year 7 2016-2017: Future Foundations


First 3 weeks	
<b>Knowledge</b>	<b>Number Topics linked to Cosmic which include topics involving the four operations such as addition, subtraction, division and multiplication</b>
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Addition</li> <li>• Subtraction</li> <li>• Multiplication</li> <li>• Division</li> <li>• Mental methods</li> <li>• Solving multi -step word problems</li> </ul>
<b>Assessment</b>	
<b>Reward &amp; enrichment</b>	
<b>Character</b>	
Autumn 1	
<b>Knowledge</b>	<ul style="list-style-type: none"> <li>• <b>Number</b> (use the order of operations with brackets, including in more complex calculations; use inverse operations; check a result by considering if it is of the right order of magnitude)</li> <li>• <b>Calculator Skills</b></li> <li>• <b>Measures</b> (convert one metric unit to another, including decimals)</li> <li>• <b>Accuracy and Bounds</b></li> </ul>
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Use of mathematical equipment</li> <li>• Reading scales</li> <li>• Estimation</li> <li>• Rounding</li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>• Students' classwork will be assessed on their understanding of Number and Measures learning objectives outlined in the knowledge section above. This will be done through teachers marking students' books and feedback will be given in the form of two stars and a wish. Students will also be assessed on their mathematical rigour and marking in books will reflect this.</li> <li>• Students will be assessed on their written piece of homework Feedback will be given in their books.</li> <li>• Towards the end of the term (Week4/5), students will undertake a topic review test for Number and Measures. 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.</li> </ul> <p>All assessed tasks will be differentiated for Yellow, Green and Blue learners.</p>
<b>Reward &amp; enrichment</b>	<ul style="list-style-type: none"> <li>• There is a Maths leaders club that runs every Tuesday night. This involves puzzles, games and critical thinking skills.</li> <li>• Home learning will encourage pupils to develop their cultural enrichment, by researching key elements of the course. Questions will be posed such as: Is zero a positive or negative number? This aims to inspire curiosity and develop communication skills for future class discussion.</li> </ul> <p>Parents can encourage students to research cultural Mathematics using a number of websites:</p> <p><b>Mathematical Games from Around the World:</b>  <a href="https://nrich.maths.org/8261">https://nrich.maths.org/8261</a></p> <p>Parents can encourage students to download inspiring TED Talks about the magic behind square numbers:  <a href="https://www.ted.com/playlists/189/math_talks_to_blow_your_mind">https://www.ted.com/playlists/189/math_talks_to_blow_your_mind</a></p>



<b>Character</b>	<p>QofS – Optimism CV – Democracy</p> <ul style="list-style-type: none"> <li>• <b>Optimism</b> – Lots of questions at different levels, enabling students to challenge themselves by moving onto harder questions independently</li> <li>• <b>Optimism</b> – 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</li> </ul>	
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## Autumn 2

<b>Knowledge</b>	<ul style="list-style-type: none"> <li>• <b>Factors, Multiples, Primes</b> (know all the squares of numbers less than 16 and be able to know the square root given the square number; use prime factorisation to represent a number as a product of its primes using index notation; extend the patterns by using the index law for division established for positive power answers, to show that any number to the power of zero is 1)</li> <li>• <b>Perimeter and Area</b> (know the formulae for the circumference and area of a circle)</li> <li>• (Indices)</li> </ul>
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Pattern recognition</li> <li>• Addition</li> <li>• Multiplication</li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>• Students' classwork will be assessed on their understanding of Factors, Multiples and Primes and Perimeter and Area learning objectives outlined in the knowledge section above. This will be done through teachers marking students' books and feedback will be given in the form of two stars and a wish. Students will be assessed on their written piece of homework. Feedback will be given in their books.</li> <li>• During Week 5 and 6, students will complete an end of term progress test that will cover many elements of what they have learnt this term. This exam will inform set movements for spring term.</li> </ul> <p>All assessed tasks will be differentiated for Yellow, Green and Blue learners.</p>
<b>Reward &amp; enrichment</b>	<ul style="list-style-type: none"> <li>• There is a Maths leaders club that runs every Tuesday night. This involves puzzles, games and critical thinking skills.</li> <li>• Home learning will encourage pupils to develop their cultural enrichment, by researching key elements of the course. Questions will be posed such as: What are perfect numbers? This aims to inspire curiosity and develop communication skills for future class discussion.</li> </ul> <p>Parents can encourage students to download inspiring TED Talks about the magic behind "monster primes": <a href="https://www.ted.com/playlists/189/math_talks_to_blow_your_mind">https://www.ted.com/playlists/189/math_talks_to_blow_your_mind</a></p>

<b>Character</b>	<p>QofS – Empathy CV – Solidarity, Caring for Others, Equality, Equity</p> <ul style="list-style-type: none"> <li>• <b>Empathy</b> – 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.</li> <li>• <b>Equality</b> – students are encouraged at all times demonstrate equality and equity through respect within the classroom.</li> </ul>	
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## Spring 1

<b>Knowledge</b>	<ul style="list-style-type: none"> <li>• <b>Geometry of 2D and 3D shapes</b></li> <li>• <b>Angles</b> (use the sum of the exterior angles of any polygon is 360°)</li> </ul> <p><b>(Trigonometry)</b></p>
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Recognising different shapes</li> <li>• Recognising parts of shapes</li> </ul> <p>Use of protractors</p>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>• Students' classwork will be assessed on their understanding of the Geometry of 2D &amp; 3D shapes and Angles learning objectives outlined in the knowledge section above. This will be done through teachers marking students' books and feedback will be given in the form of two stars and a wish.</li> </ul>



	<ul style="list-style-type: none"> <li>Students will be assessed on their written piece of homework. Feedback will be given in their books.</li> <li>Towards the end of the term (Week4/5), students will undertake a topic review test for Geometry of 2D &amp; 3D shapes and Angles. 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.</li> </ul> <p>All assessed tasks will be differentiated for Yellow, Green and Blue learners.</p>
<b>Reward &amp; enrichment</b>	<ul style="list-style-type: none"> <li>There is a Maths leaders club that runs every Tuesday night. This involves puzzles, games and critical thinking skills.</li> <li>Home learning will encourage pupils to develop their cultural enrichment, by researching key elements of the course. Questions will be posed such as: Who was Euclid? What did he notably discover and why was he so important to the development of Mathematics? This aims to inspire curiosity and develop communication skills for future class discussion.</li> </ul> <p>Parents can encourage students to download inspiring TED Talks about the Maths around Origami:  <a href="https://www.ted.com/playlists/189/math_talks_to_blow_your_mind">https://www.ted.com/playlists/189/math_talks_to_blow_your_mind</a></p>
<b>Character</b>	<p>QofS – Creativity and Curiosity CV – Openness</p> <ul style="list-style-type: none"> <li><b>Creativity</b> – Students can demonstrate creativity with a series of questioning/describing tasks. One student is given a shape. Individuals in the class ask the student in the ‘hotseat’ ‘yes/no response questions to investigate and discover the original shape. Can be modified in a variety of ways including boys turn to ask questions, then girls turn, etc. This adds an additional level of competition</li> <li>One student is shown a diagram featuring a combination of shapes/lines. This student must describe what they could remember to their classmates, without using their hands</li> <li><b>Curiosity</b> – large number of opportunities for investigative tasks; measuring (both interior and exterior) angles of various shapes and deducing general rules#</li> <li><b>Openness</b> – during lesson time, teachers encourage students to share their work through the use of a visualizer and discuss their solutions with the rest of the class.</li> </ul>
<b>Spring 2</b>	
<b>Knowledge</b>	<ul style="list-style-type: none"> <li><b>Fractions</b> (add and subtract simple fractions with denominators of any size)</li> <li><b>Symbols</b> (simplify algebraic expressions by collecting like terms; construct expressions from worded descriptions, using addition and subtraction)</li> </ul>
<b>Skills</b>	<ul style="list-style-type: none"> <li>Recognising parts of a whole</li> <li>Division</li> <li>Multiplication</li> <li>Simplifying</li> <li>Substitution</li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>Students’ classwork will be assessed on their understanding of the Fractions and Symbols learning objectives outlined in the knowledge section above. This will be done through teachers marking students’ books and feedback will be given in the form of two stars and a wish.</li> <li>Students will be assessed on their written piece of homework. Feedback will be given in their books.</li> <li>During week 2 and 3, students will complete an end of term progress test that will cover many elements of what they have learnt this term. This exam will inform set movements for Summer term.</li> </ul> <p>All assessed tasks will be differentiated for Yellow, Green and Blue learners.</p>
<b>Reward &amp; enrichment</b>	<ul style="list-style-type: none"> <li>There is a Maths leaders club that runs every Tuesday night. This involves puzzles, games and critical thinking skills.</li> </ul> <p>Home learning will encourage pupils to develop their cultural enrichment, by researching key elements of the course. Questions will be posed such as: Can you find a formula that you would use in three of your other subjects? This aims to inspire curiosity and develop communication skills for future class discussion.</p>



<p><b>Character</b></p>	<p>QofS – Responsibility and Reflection CV – Honesty and Social Responsibility</p> <ul style="list-style-type: none"> <li>• <b>Reflection</b> – large number of opportunities for peer assessment contained within topics; has your partner simplified an algebraic expression correctly.</li> <li>• <b>Reflection</b> - Can students use mathematical symbols to describe a scenario? e.g. Emma has <math>x</math> sweets, Pete has five more than Emma, write an expression for the number of sweets Pete has.</li> <li>• <b>Honesty</b> – students are encouraged to be honest when self-assessing their/others' work.</li> </ul> 
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## Summer 1

<p><b>Knowledge</b></p>	<ul style="list-style-type: none"> <li>• <b>Percentages</b> (find a percentage of a quantity using a multiplier; use a multiplier to increase or decrease by a percentage)</li> <li>• <b>Data Types and Sampling</b></li> <li>• <b>FDP</b> (order fractions, decimals and percentages; use division to convert a fraction to a decimal)</li> </ul>
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<p><b>Skills</b></p>	<ul style="list-style-type: none"> <li>• Division</li> <li>• Multiplication</li> <li>• Interpreting data</li> </ul>
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<p><b>Assessment</b></p>	<ul style="list-style-type: none"> <li>• Students' classwork will be assessed on their understanding of the Percentages, Data Types and Sampling learning objectives outlined in the knowledge section above. This will be done through teachers marking students' books and feedback will be given in the form of two stars and a wish.</li> <li>• Students will be assessed on their written piece of homework. Feedback will be given in their books.</li> <li>• Towards the end of the term (Week4/5), students will undertake a topic review test for Percentages, Data Types and Sampling. 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.</li> </ul> <p>All assessed tasks will be differentiated for Yellow, Green and Blue learners.</p>
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<p><b>Reward &amp; enrichment</b></p>	<ul style="list-style-type: none"> <li>• There is a Maths leaders club that runs every Tuesday night. This involves puzzles, games and critical thinking skills</li> <li>• Pupils have the opportunity to take part in the Junior Maths Challenge.</li> <li>• Home learning will encourage pupils to develop their cultural enrichment, by researching key elements of the course. Questions will be posed such as: Florence Nightingale used data to help improve standards of care for wounded soldiers. Can you find out about her mathematical contributions? This aims to inspire curiosity and develop communication skills for future class discussion.</li> </ul>
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<p><b>Character</b></p>	<p>QofS – Practice and Resiliency CV – Self-Help</p> <ul style="list-style-type: none"> <li>• <b>Practice</b> – lots of opportunities to practice conversions between fractions, decimals and percentages through interactive activities.</li> <li>• <b>Resiliency</b> – FDP is a difficult topic to master and questions can be posed in many guises. Students must develop their resiliency through problem solving exercises</li> <li>• <b>Self-help</b> – students are encouraged to consult their books or their buddies prior to asking a teacher for help, encouraging independent learning.</li> </ul> 
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## Summer 2

<p><b>Knowledge</b></p>	<ul style="list-style-type: none"> <li>• <b>Sequences</b></li> <li>• <b>Equations, Iteration and Inequalities</b> (solve simple two-step linear equations with integer coefficients, of the form <math>ax \pm b = c</math>; use systematic trial and improvement to find the approximate solution to one decimal place of equations such as <math>x^3 = 29</math>, rearrange simple equations)</li> <li>• <b>(Quadratic Sequences</b></li> <li>• <b>Quadratics and Polynomials</b></li> <li>• <b>Simultaneous Equations)</b></li> </ul>
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<p><b>Skills</b></p>	<ul style="list-style-type: none"> <li>• Pattern recognition</li> <li>• Substitution</li> <li>• Multiplication</li> </ul>
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	<ul style="list-style-type: none"> <li>• Division</li> <li>• Addition</li> <li>• Subtraction</li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>• Students' classwork will be assessed on their understanding of Sequences, Equations, Iterations and Inequalities learning objectives outlined in the knowledge section above. This will be done through teachers marking students' books and feedback will be given in the form of two stars and a wish. Students will be assessed on their written piece of homework. Feedback will be given in their books.</li> <li>• During week 2 and 3, students will complete an end of year progress test that will cover many elements of what students have learnt across the year. This exam will inform set movements for Year 8.</li> </ul> <p>All assessed tasks will be differentiated for Yellow, Green and Blue learners.</p>
<b>Reward &amp; enrichment</b>	<ul style="list-style-type: none"> <li>• There is a Maths leaders club that runs every Tuesday night. This involves puzzles, games and critical thinking skills.</li> <li>• Home learning will encourage pupils to develop their cultural enrichment, by researching key elements of the course. Questions will be posed such as: What can you find out about the Fibonacci sequence? This aims to inspire curiosity and develop communication skills for future class discussion.</li> </ul> <p>Parents can encourage students to download inspiring TED talks about the properties of Fibonacci sequences.  <a href="https://www.ted.com/playlists/189/math_talks_to_blow_your_mind">https://www.ted.com/playlists/189/math_talks_to_blow_your_mind</a></p>
<b>Character</b>	<p>QofS – Motivation  CV – Self-Responsibility</p> <ul style="list-style-type: none"> <li>• <b>Motivation</b> – Equations range from being very simple to very complex. By students understanding the learning journey for this topic, this provides motivation for their achievement.</li> <li>• <b>Self-responsibility</b> – students are asked to take responsibility for their revision by being given topic lists for their exam and using this to guide their revision.</li> </ul> 