



Key Stage 3 Framework for Learning Year 8 2018-2019: Creative Foundations

Curriculum Area: Maths



Year 8	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Knowledge	Revision of key number topics from Year 7 Four operations Order of operations Negative numbers Fractions Algebra Fractions 2 Multiply and divide a fraction by an integer Multiply and divide proper and improper fractions and mixed numbers both positive and negative Find a fraction of an amount Find a whole amount given a fraction of an amount Find a fractional increase and decrease	Percentages Define percentage as 'number of parts per hundred' Interpret diagrams as percentages and vice versa Find a percentage of an amount Interpret percentages as operations, with and without a calculator Interpret percentages as a fraction or decimal Express one quantity as a percentage of another Compare two quantities using percentages, and work with percentages greater than 100% Percentage increase, decrease and original value problems and simple interest in financial mathematics	Expressions and Formulae Substitute numerical values into formulae and expressions, including scientific formulae. Simplify and manipulate algebraic expressions to maintain equivalence by: <ul style="list-style-type: none"> • multiplying a single term over a bracket • taking out common factors • expanding products of two or more binomials. • simplifying expressions involving sums, products and powers, including the laws of indices. Use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement) <ul style="list-style-type: none"> • Include equations with brackets • Include fractional equations 	Expressions and Formulae Continued Understand and use the concepts and vocabulary of inequalities. <ul style="list-style-type: none"> • Represent the solution set to an inequality on a number line and vice versa • Find the integer solutions of an inequality. • Solve linear inequalities in one variable. • Rearrange formulae to change the subject, where the subject appears once Geometry – Circles and Area Convert between cm^2 and m^2 Derive and apply formulae to calculate and solve problems involving area of circles, composite shapes and trapeziums. Calculate and solve problems involving perimeters of 2-D shapes (including circles). Including examples using algebra, fractions, decimals, etc.	Ratio, proportion & rates of change Change freely between related standard units [for example time, length, area, volume/capacity, mass] Use ratio notation, including reduction to simplest form. Divide a given quantity into two or more parts. Given information about one part, find the whole or other part(s). Understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction. Use compound units such as speed, unit pricing and density to solve problems. Solve problems involving direct and inverse proportion, including graphical and algebraic representations. Examples may include: <ul style="list-style-type: none"> • Recipe problems • Best buy problems • Exchange rates Draw and interpret pie charts.	Statistics Construct and analyse stem and leaf diagrams, including back to back. For non-grouped data given in the form of a table, find the mean, median, mode and range. Geometry – 3D shapes Use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3-D. Convert between cm^3 and m^3 Know and use the fact that 1 litre = 1000cm^3 Derive and apply formulae to calculate and solve problems involving volume and surface area of cuboids (including cubes) and other prisms (including cylinders). Construct and interpret plans and elevations of 3-D shapes.
Skills	<ul style="list-style-type: none"> • Addition • Subtraction • Multiplication • Division 	<ul style="list-style-type: none"> • Addition • Subtraction • Multiplication • Division 	<ul style="list-style-type: none"> • Multiplication using the grid method • Identifying common factors 	<ul style="list-style-type: none"> • Addition • Subtraction • Multiplication • Division 	<ul style="list-style-type: none"> • Multiplication • Division • Ability to recall conversions • Use of mathematical 	<ul style="list-style-type: none"> • Addition • Subtraction • Multiplication • Division

ELE – 1 Day

ELE – 3 Days



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	<ul style="list-style-type: none"> • Use of diagrams to demonstrate methods • Problem solving using multiple methods • Ability to reason mathematically 	<ul style="list-style-type: none"> • Use of diagrams to demonstrate methods • Problem solving using multiple methods • Ability to reason mathematically • Ability to revise from a variety of resources such as Mathswatch and PiXL in preparation for the Autumn Progress Test 	<ul style="list-style-type: none"> • Problem solving using multiple methods <ul style="list-style-type: none"> • Ability to reason mathematically 	<ul style="list-style-type: none"> • Ability to recall conversions • Use of diagrams to demonstrate methods • Problem solving using multiple methods • Ability to reason mathematically • Ability to revise from a variety of resources such as Mathswatch and PiXL in preparation for the Spring Progress Test 	<ul style="list-style-type: none"> • equipment such as a protractor • Reading from a graph • Problem solving using multiple methods • Ability to reason mathematically 	<ul style="list-style-type: none"> • Recognising 3D shapes • The ability to view 3D shapes as 2D elevations. • Problem solving using multiple methods • Ability to revise from a variety of resources such as Mathswatch and PiXL in preparation for the Summer Progress Test
Assessments	<p><i>Marking Point 1</i></p> <p>Week 1/2 - This will be a significant piece of work on the revision topics in their exercise book (highlighted by coloured paper) – feedback will be given in the form of two stars and a wish</p> <p><i>Marking Point 2</i></p> <p>Week 3/4 Students will be assessed on their written piece of homework on Fractions. Feedback will be given in their books in the form of two stars and a wish</p> <p><i>Marking Point 3</i></p> <p>Week 5/6 - students will undertake a topic review test for Fractions. 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.</p>	<p><i>Marking Point 1</i></p> <p>Week 1/2 - This will be a significant piece of work on Percentages in their exercise book (highlighted by coloured paper) – feedback will be given in the form of two stars and a wish</p> <p><i>Marking Point 2</i></p> <p>Week 3/4 Students will be assessed on their written piece of homework on Percentages. Feedback will be given in their books in the form of two stars and a wish</p> <p><i>Marking Point 3</i></p> <p>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</p>	<p><i>Marking Point 1</i></p> <p>Week 1/2 - This will be a significant piece of work on Algebra in their exercise book (highlighted by coloured paper) – feedback will be given in the form of two stars and a wish</p> <p><i>Marking Point 2</i></p> <p>Week 3/4 Students will be assessed on their written piece of homework on Algebra. Feedback will be given in their books in the form of two stars and a wish.</p> <p><i>Marking Point 3</i></p> <p>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.</p>	<p><i>Marking Point 1</i></p> <p>Week 1/2 - This will be a significant piece of work on Geometry - Circles and Area in their exercise book (highlighted by coloured paper) – feedback will be given in the form of two stars and a wish</p> <p><i>Marking Point 2</i></p> <p>Week 3/4 Students will be assessed on their written piece of homework on Geometry- Circles and Area. Feedback will be given in their books in the form of two stars and a wish.</p> <p><i>Marking Point 3</i></p> <p>Week 5/6 - students will undertake a Progress Test that will encompass everything covered in the Spring Term. Students will be given feedback in the form of two stars and a wish</p>	<p><i>Marking Point 1</i></p> <p>Week 1/2 - This will be a significant piece of work on Ratio and Proportion in their exercise book (highlighted by coloured paper) – feedback will be given in the form of two stars and a wish</p> <p><i>Marking Point 2</i></p> <p>Week 3/4 Students will be assessed on their written piece of homework on Ratio and Proportion. Feedback will be given in their books in the form of two stars and a wish.</p> <p><i>Marking Point 3</i></p> <p>Week 5/6 - students will undertake a topic review test for Ratio and Proportion 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.</p>	<p><i>Marking Point 1</i></p> <p>Week 1/2 - This will be a significant piece of work on Statistics in their exercise book (highlighted by coloured paper) – feedback will be given in the form of two stars and a wish</p> <p><i>Marking Point 2</i></p> <p>Week 3/4 Students will be assessed on their written piece of homework on Geometry – 3D Shapes. Feedback will be given in their books in the form of two stars and a wish.</p> <p><i>Marking Point 3</i></p> <p>Week 5/6 - students will undertake a Progress Test that will encompass everything covered in the Summer Term. Students will be given feedback in the form of two stars and a wish</p>
Cultural Enrichment	<p>READ</p> <p>Parents can encourage students to research irrational numbers, with an</p>	<p>READ</p> <p>'Sums of Powers – A Festive Story'</p>	<p>READ</p> <p>Read all about one of Manchester's famous Mathematicians, Alan Turing</p>	<p>READ</p> <p>Parents can encourage students to research the history behind magic</p>	<p>READ</p> <p>'All About Infinity'</p> <p>Read about why we need the</p>	<p>READ</p> <p>The Graphic Work by MC Escher which showcases the unique graphic</p>



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<p>introduction written by NRICH Maths: https://nrich.maths.org/8394</p> <p>WATCH</p> <p>Parents can encourage students to download an inspiring TED Talk – Maths is the hidden secret to understanding the world (reflecting on fractions from a completely different perspective and linking to Empathy, one of Qualities of Success)</p> <p>https://www.ted.com/talks/roger_antonsen_math_is_the_hidden_secret_to_understanding_the_world</p> <p>VISIT</p> <p>Legoland Manchester and use Lego to explore fractions – see the following video for inspiration! https://www.youtube.com/watch?v=ILUJdSst32c</p>	<p>A story for students about adding powers of integers – with a festive twist. https://nrich.maths.org/9469</p> <p>WATCH</p> <p>A case study on how the music industry uses percentages: http://www.bbc.co.uk/guides/zcwmk2p#zkwrqj6</p> <p>VISIT</p> <p>Jodrell Bank Observatory that has a number of radio telescopes. Understand the functions of each telescope, linking this to key mathematical formulae such as speed, distance and time.</p>		<p>and discover the contributions he made to Mathematics https://www.britannica.com/biography/Alan-Turing</p> <p>WATCH</p> <p>A discussion of the problems of language, and how algebraic notation is an attempt to avoid any ambiguities: https://www.bbc.com/education/clips/zwf8q6f</p> <p>VISIT</p> <p>For an exciting family experience, visit Breakout Manchester and use your mathematical problem-solving skills to escape from a room in less than an hour!</p>	<p>squares, with an introduction written by NRICH Maths: https://nrich.maths.org/8394</p> <p>WATCH</p> <p>Parents can encourage students to download an inspiring TED Talk about the maths behind Origami: https://www.ted.com/talks/robert_lang_folds_way_new_origami</p> <p>VISIT</p> <p>Visit the Museum of Science & Industry (MOSI) Understand how angles/bearings are used by pilots in Fly 360, their hands-on flight simulator</p>	<p>concept of infinity and how this relates to natural numbers: https://nrich.maths.org/2756</p> <p>WATCH</p> <p>A variety of talks by brilliant women in STEM – these women are trailblazers inspiring a new generation of girls to follow their lead and change the ratio in Science, Technology, Engineering and Maths) https://www.ted.com/playlists/253/11_ted_talks_by_bright_women</p> <p>VISIT</p> <p>The Big Bang Fair North West – Look out for key dates for this fantastic exhibition aimed at the UK’s Young Scientists and Engineers – visit http://www.thebigbangfair.co.uk/</p>	<p>language of patterns, puzzles and mathematics.</p> <p>WATCH</p> <p>‘A Brief History of Pi’ A deep and accessible account of the origins of Pi: https://www.transum.org/software/SW/YouTube/Video.asp?Movie=1-JAx3nUwms</p> <p>VISIT</p> <p>Visit the National Football Museum to explore how statistics are used in the context of football and league tables http://www.nationalfootballmuseum.com</p>
Character	LEADERSHIP		INITIATIVE		RESILIENCE	



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QofS – Optimism

Optimism – Many of the Anchor Tasks provide students with the opportunity to approach a problem using different methods and representations, encouraging students to become optimistic about solving problems that may seem unfamiliar.



QofS – Empathy

Empathy – Students are encouraged every lesson to listen to, and evaluate other students' methods, especially during the Anchor Task .



QofS – Creativity & Curiosity

Creativity – Students can demonstrate creativity within the journaling of their Anchor Task. This involves describing which methods they could use to solve a problem and evaluating which method is the most efficient.

Curiosity – Students develop curiosity of algebra by exploring expression in a number of representations, with the use of diagrams and manipulatives.



QofS – Responsibility & Reflection

Reflection – large number of opportunities for students to assess others' methods when they are asked to journal their Mathematics.

Responsibility – students are provided with revision lists for their Spring progress Tests and are encouraged to take responsibility for their own revision.



QofS – Practice & Resiliency

Practice – students have the opportunity to practise representing ratio and proportion in a number of ways, such as the bar model or use of ratio tables.

Resiliency – Anchor tasks are often quite challenging tasks – students are encouraged to work as a group and be resilient in approaching such tasks.



QofS – Motivation

Motivation – students are encouraged to come up with many ways of solving a problem, not just one. It is better to solve a problem five ways than to solve five problems!