

Maths Phase One Curriculum

Curriculum Intent:

The National Curriculum for Mathematics states that *'Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems.'* (National Curriculum 2014) Mathematics is not just a subject that we decided to teach, it is a subject that provides children with a set of skills to make the world we live in continue to adapt and develop. It is more than just learning basic facts, it is about **mathematical reasoning**, following lines of inquiry, making conjectures and generalisations, and investigating those generalisations. *'Becoming a proficient mathematician means working with all of the proficiencies – fluency, problem solving, reasoning and understanding'* (Askew, M. 2012) and at Trinity St Edward's we aim for **all of our children** to be given the opportunity to think deeply and ultimately access the **breath of the national curriculum**. This involves both us as teachers and our children having a **growth mind-set**, a knowledge and understanding about brain science and the determination and resilience to succeed in our subject. Our lessons will be **challenging** and we aim to push children to think deeply every day, with sky-high expectations. We want our children to think, speak and act like Mathematicians, which means using the correct vocabulary and articulate their ideas. We aim to **teach for understanding** and through modelling and a rich choice of material and resources, ensure all of our children develop a deep **conceptual understanding**.

Year 7

Year 7 students will follow the White Rose scheme of learning which will provide access to all the objectives from the National Curriculum. The scheme is made of units that are designed to be taught for a period of between 1 and 3 weeks to allow students to spend enough time to get a deep understanding of the topic being covered. All groups will cover the units at the same time. The scheme has been designed to allow for the interleaving of skills, progress is made through the units so that the students' understanding, and knowledge is reinforced and extended. Students are given opportunities throughout the scheme to develop their written and mental arithmetic, however the scheme also allows for calculator skills to be developed. There is a mini assessment for each unit to check for understanding of the key skills throughout the year. There are also three assessments to be taken within the year. The assessments cover all topics that the students have been taught through the course.

Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Algebraic Thinking	Place value and the application of number	Applications of number and statistics	Directed number and fractional thinking	Geometry and measure, and fractional thinking	Geometry and measure, and proportion
<ul style="list-style-type: none"> Sequences Algebraic notation Equality & equivalence 	<ul style="list-style-type: none"> Ordering integers & decimals Problems with addition, subtraction, 	<ul style="list-style-type: none"> Estimating and rounding Statistics <p>Within this unit students build on their</p>	<ul style="list-style-type: none"> Operations & equations with directed number Fractional thinking 	<ul style="list-style-type: none"> Area and perimeter Addition and subtraction of fractions 	<ul style="list-style-type: none"> Angles and polygons Speed, distance and time

<p>During this unit we will start by exploring sequences in detail, using diagrams, graphs and lists of numbers. We will use these representations to recognise the difference between linear and non-linear sequences. We then begin to understand and use algebra notation, developing a deep understanding of basic algebraic forms and substituting into expressions. Finally, we will start to focus on the meaning of equality and equivalence when it comes to forming and solving equations.</p>	<p>multiplication and division</p> <p>Within this unit we will develop our place value knowledge with integers up to one billion and decimals to hundredths. We will use number lines, as well as other representations to ensure conceptual understanding.</p> <p>The second part of this unit is focused on solving problems with addition, subtraction, multiplication and division; extending and building on the formal methods students have developing in KS2. Problems will be drawn from the contexts of perimeter, money, area and mean, allowing students to apply their knowledge to range of problems.</p>	<p>understanding of place value and learn to round to significant figures, with both integers and decimals.</p> <p>Students will then go on to construct and interpret pictograms, bar charts, dual bar charts, scatter graphs and time series graphs which they may have met previously at Primary school. They will look for trends in the data and start to make comparisons.</p>	<ul style="list-style-type: none"> Fractions & percentages of an amount <p>The first part of this unit focuses on the key concept of working out fractions and percentages of quantities and the links between the two. The second part of this unit is designed to extend and deepen the student's understanding of directed number. Multiple representations and contexts will be used to enable students to appreciate the meaning behind operations with negative integers. This block also provides valuable opportunities for revising and extending earlier topics, notably algebraic areas such as substitution and the solution of equations.</p>	<p>In this unit students build on Key Stage 2 learning on converting metric units of length and distance, finding the perimeter and area of a range of polygons preparing them for solving problems later in the block.</p> <p>The secondary part of this unit builds on work completed in term 4. It will provide more experience of equivalence of fractions, which we will apply to this 'addition and subtraction of fractions' block.</p>	<p>Students will start to learn and use new geometric language, learn the names and properties of a range of polygons. Angle rules will be introduced and used to form short chains of reasoning, including investigation work with parallel line rules.</p> <p>Students will then explore the relationship between speed, distance and time, with the emphasis on understanding the meaning of speed, rather than using a formula. They will go on to interpret journeys represented on distance–time graphs.</p>
--	---	--	---	--	--

Year 8

Year 8 students will follow the White Rose scheme of learning which will provide access to all the objectives from the National Curriculum. The scheme is made of units that are designed to be taught for a period of between 1 and 3 weeks to allow students to spend enough time to get a deep understanding of the topic being covered. All groups will cover the units at the same time. The scheme has been designed to allow for the interleaving of skills, progress is made through the units so that the students' understanding, and knowledge is reinforced and extended. Students are given opportunities throughout the scheme to develop their written and mental arithmetic, however the scheme also allows for calculator skills to be developed. There is a mini assessment for each unit to check for understanding of the key skills throughout the year. There are also three assessments to be taken within the year. The assessments cover all topics that the students have been taught through the course.

Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Proportional Reasoning	Algebraic Manipulation, and application of number	Developing Geometry, and Algebraic Technique	Developing Number Sense	Developing Geometry and Statistics	Statistic, Geometry and Sequences
<ul style="list-style-type: none"> Ratio & Scale Multiplicative change <p>During this unit, students focus initially on the meaning of ratio and the various models that can be used to represent ratios. We also explore the links between ratio and fractions and understand and use π as the ratio of the circumference of a circle to its diameter.</p> <p>In the second part of the unit, we will work</p>	<ul style="list-style-type: none"> Algebraic manipulation Working in the cartesian plane <p>During this unit students will look formally at algebraic rules for straight lines on graphs. They will explore the notions of gradients and intercepts and be able to use equations to produce lines.</p> <p>The second part of the unit will be deepening our understanding of multiplying and</p>	<ul style="list-style-type: none"> Area, volume, density Brackets, equations & inequalities <p>Students will start this unit extending their knowledge of geometry by solving problems with area and volume. They will then be introduced to density through familiar comparisons, such as looking at how the same mass of different materials occupies different amounts of space.</p>	<ul style="list-style-type: none"> Fractions & Percentages Standard index form Indices <p>The first part of this unit focuses on the relationship between fractions and percentages, including decimal equivalences, and using these to work out percentage increase and decrease. Financial maths is developed through the context of profit, loss, debt and interest.</p>	<ul style="list-style-type: none"> Angles in parallel lines & polygons Statistics <p>During this unit, students will deepen their understanding and application of angle notation and relationships, extending all students to explore angles in parallel lines and thus solving increasingly complex missing angle problems. Links are then made to the closely connected properties of polygons and quadrilaterals.</p>	<ul style="list-style-type: none"> Probability Circles Sequences <p>Within this unit students will carry out and interpret simple probability experiments, exploring the difference between theoretical and experimental probability.</p> <p>Students will then be introduced to pi (π) and explore the relationship between a circle's diameter and its circumference</p>

with the link between ratio and scaling, including the idea of direct proportion, linking various area of the Maths curriculum providing rich opportunities for problem solving.	dividing fractions, and extending our knowledge to understand the term reciprocal.	Building on their understanding of equivalence from year 7, students will explore expanding brackets over a single bracket and factorising by taking out common factors. They will revisit and extend their knowledge of solving equations, now to including brackets and with unknowns on both sides.	During the second part of this unit, students deepen and extend their knowledge of standard form and index laws from term 3 and year 7. They will now be working to apply the four operations to standard form and solve problems in a range of contexts.	Students will then deepen their knowledge of statistics, with a particular focus on learning to compare different distributions of data. We will explore when graphs may be misleading, an important real-life consideration. This is a great unit to explore the cross-curriculum relationship between Maths and Science.	before going on to solve problems with area and perimeter. Finally, students will continue to develop their knowledge of sequences with a focus on more complex algebraic rules now that students are more familiar with a wider range of notation.
--	--	--	---	--	--

Year 9

Year 9 students will follow the White Rose scheme of learning which will provide access to all the objectives from the National Curriculum. The scheme is made of units that are designed to be taught for a period of between 1 and 3 weeks to allow students to spend enough time to get a deep understanding of the topic being covered. All groups will cover the units at the same time. The scheme has been designed to allow for the interleaving of skills, progress is made through the units so that the students' understanding, and knowledge is reinforced and extended. Students are given opportunities throughout the scheme to develop their written and mental arithmetic, however the scheme also allows for calculator skills to be developed. There is a mini assessment for each unit to check for understanding of the key skills throughout the year. There are also two larger assessments to be taken within the year. The assessments cover all topics that the students have been taught through the course.

Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Reasoning with Number	Reasoning with Geometry, and Algebraic Thinking	Reasoning with Number and Algebraic Technique	Reasoning with Proportion	Algebraic thinking and Geometry	Algebraic representation and Probability
<ul style="list-style-type: none"> Properties of number Percentages <p>During this block students will further develop their flexibility with number, consolidating and extending their learning with fractions, decimals, prime factors, surds and percentages.</p> <p>Students will develop an understanding of interest, apply this to real life contexts.</p>	<ul style="list-style-type: none"> Area and volume Equations, inequalities and formulae <p>Students will explore three-dimensional shapes in a variety of ways. They will explore nets, plans and elevation, as well as surface area and volume.</p> <p>In the second part of this unit, students will practice forming and solving equations and inequalities in a range of context.</p>	<ul style="list-style-type: none"> Standard Form Maths and money Straight line graphs <p>During this block students will further develop their flexibility with number, consolidating and extending their learning of standard form and problems with money.</p> <p>In the second part of this unit, students will build on their understanding of linear equations from year 7 and 8, students will explore straight-line equations on graphs.</p>	<ul style="list-style-type: none"> Solving ratio and proportion problems Similarity <p>This block is all about proportion, both with number and geometry. Students will look at both direct and inverse proportion and link this learning to speed, distance and time. We learned about similarity and congruency in year 8, but this block is about linking that prior knowledge with enlargement, focusing on both integer and fractional scale factors.</p>	<ul style="list-style-type: none"> Pythagoras' Theorem Algebraic manipulation. <p>This block of learning will focus on developing our student's reasoning skills through the lens of geometry. Students will be introduced to Pythagoras, the history of the topic and apply this learning to a range of contexts.</p> <p>In the second part of the unit students will continue to manipulate algebraic expression by expanding and factorising both linear and quadratic expressions.</p>	<ul style="list-style-type: none"> Non-linear graphs Probability Transformations <p>Building on the student's understanding of linear equations from year 7 and 8, students will now explore non-linear equations such as quadratics and cubic equations graphically.</p> <p>In the second part of the unit, we will further develop our understanding of probability, specifically using a Venn diagram to represent information.</p>

Who to contact about Phase One Maths:

Mrs Stephanie Corker Curriculum Leader: Maths – scorker@stedwards.trinitymat.org