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 proportion**	**Applications of number**	**Directed number and fractional thinking**	**Lines and angles**	**Reasoning with number**
• Sequences • Algebraic notation • Equality & equivalence	• Ordering integers & decimals • FDP equivalence Within this unit we will develop our place	• Problems with addition & subtraction • Problems with multiplication & division	• Operations & equations with directed number Fractional thinking	• Addition and subtraction of fractions • Constructing, measuring & using geometric notation	• Developing number sense • Sets & Probability • Prime numbers & Proof

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.	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. Building on this work with decimals, we will start to develop a deep understanding of the links between fractions, decimals and percentages so that they can convert fluently between those most commonly seen in real-life.	The first 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, charts and tables, frequency tree, area and mean, allowing students to apply their knowledge to range of problems.	• Fractions & percentages of an amount 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.	• Develop geometric notation The first part of this unit builds on early work in term 2. It will provide more experience of equivalence of fractions, which we will apply to this 'addition and subtraction of fractions' block. Students will start to measure increasingly complex diagrams using correct mathematical notation. They will also 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.	During this unit students will review and extend their mental strategies with a focus on using a known fact to find other facts. They will also be introduced to probability and learn about sets, set notation and systematic listing strategies. This block will provide students with the opportunity to revisit work with fractions, decimals and percentages. They will be encouraged to develop their reasoning skills by started making conjectures and following lines of inquiry.

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	**Representation**	**Algebraic Technique**	**Developing Number Sense**	**Developing Geometry**	**Reasoning with Data**
• Ratio & Scale • Multiplicative change • Multiplying & dividing fractions 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. In the second part of the unit, we will work	• Working in the cartesian plane • Collecting and representing data • Probability 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. The second part of this unit allows students to extend their knowledge of graphs and charts with both	• Brackets, equations & inequalities • Sequences 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.	• Fractions & Percentages • Standard index form • Indices 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. During the second part of this unit, students	• Angles in parallel lines & polygons • Area of trapezia & circles 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.	• Lines of symmetry & reflection • The data handling cycle • Measure & location A particular focus for this unit is using charts to compare different distributions. We will explore when graphs may be misleading, an important real-life consideration. Students will be re-visiting their knowledge of averages, and are expected to look at when and why each average should be

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. The last part of the unit will be deepening our understanding of multiplying and dividing fractions, and extending our knowledge to understand the term reciprocal.	discrete and continuous data. They will extend this knowledge by applying their ideas of probability from year 7, in particular looking at sample space and the use of tables to represent possible outcomes.	The second part of this unit looks at sequences with more complex algebraic rules now that students are more familiar with a wider range of notation.	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.	The second part of this unit will build on prior knowledge of area but extending this understanding to a trapezium and a circle. A key aspect of the unit is choosing and using the correct formula for the correct shape, reinforcing recognising the shapes, their properties and names and looking explicitly at compound shapes.	used. They will have the opportunity to compare distributions, use these averages and the range to consider outliers and what effect these have on all the measures studied, and whether they should be included or excluded in our calculations. This is a great unit to explore the cross curriculum relationship between Maths and Science.

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 Algebra	Constructing in 2 and 3 Dimensions	Reasoning with Number	Reasoning with Geometry	Reasoning with Proportion	Representation and Probability

• Straight Line Graphs • Forming and solving equations • Testing conjectures Building on their understanding of linear equations from year 7 and 8, students will explore straight-line equations on graphs, as well as forming and solving equations with unknowns on both sides.	• Three dimensional shapes • Constructions and congruency For the first time since KS2, students will study three-dimensional shapes in a variety of ways. They will explore nets, plans and elevation, as well as surface area.	• Numbers • Using percentages • Maths and money During this block students will further develop their flexibility with number, consolidating and extending their learning with fractions, decimals, percentages and standard form.	• Deduction • Rotation and translation • Pythagoras' Theorem This block of learning will focus on developing our student's reasoning skills through the lens of geometry. We will be making and testing conjectures, following lines of enquiry, and exploring proof. We will also be looking at a range of transformations which builds on our work in year 8.	• Solving ratio and proportion problems • Enlargement and similarity This block is all about proportion, both with number and geometry. 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.	• Probability • Solving problems using graphs, tables and algebra During this block of learning, we will develop our understanding of proportion further by applying it to a range of real life and scientific contexts. We will be calculating speed, density and mass through the lens of proportion.

Who to contact about Phase One Maths:
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