Year 10 Mathematics

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Christmas	Similarity			Developing Algebra		
	Congruence, similarity and enlargement		Trigonometry	Representing solutions of equations and inequalities		Simultaneous equations
Lent	Geometry			Proportional Change		
	Angles and bearings	Working with circles	Vectors	Ratios and Fractions	Percentages and interest	Probability
Pentecost	Delving into Data		Using Number			Expressions
	Collecting, represing and interpreting data		Non Calculator methods	Types of number and sequences	Indices and Roots	Manipulating expressions

"Together towards our Lord, through learning, love and faith"

Year 10 Mathematics – Christmas Term

Congruence, similarity and enlargement	Following on from the spring term of Year 9 where you studied enlargement and the summer term where you studied ratio, we now bring these topics together to look at congruence, similarity and enlargement. In this unit, you revise your knowledge of angles in parallel lines from summer term year 8.This unit precedes trigonometry where you will learn how the ratios between similar right-angled triangles enable us to solve problems involving sin, cos and tan.
Trigonometry	Using our knowledge of similar triangles from unit 1 we explore the special case of similar right-angled triangles and how that links to trigonometry. We then look at how these special ratios can be used to help us find missing angles and sides in right angles triangles. We will revisit Pythagoras' theorem (initially learned in year 9) as well as looking at the exact values of some commonly used angles to help us solve problems without a calculator.
Representing solutions of equations and inequalities	We have studied both inequalities and equations in Key stage three. In this unit we start with reinforcing the techniques and methods to solve them before moving on to looking at the key differences between equations and inequalities and explore how graphs can be used to represent the solutions to inequalities. We will also look at forming equations which will involve revision from many of the areas in geometry including angles, area and perimeter. Some students will also look at factorising to solve quadratic equations.
Simultaneous equations	Having just solved linear equations we now look at simultaneous equations using both graphical and algebraic equations. Substitution is taught first followed by eliminations. With substitution learning will start with equations with matching coefficients and move on to those where students need to multiple first. Some students will move onto equations where one is quadratic.

Year 10 Mathematics – Lent Term

Angles and bearings	This is the first time that we have seen bearings however all students should be confident on the angle rules needed to access this. Accurate drawing of both angles and lines is needed as well as a good understanding of parallel angle rules. We will also look at the use of pythagoras and trigonometry in real life.
Working with circles	We start this unit with a revision of the area and circumference of circles. We then use this alongside previous understanding of fractions to develop the understanding of the areas of sectors and the length of arcs. We then build this knowledge into 3D shapes where we look at surface area and volume of cones and spheres. Some students will also look at the ratio between the areas and volumes of similar shapes.
Vectors	Although we know vectors already as they describe translations, we now look at the more formal vector notation and looking at how to explore different journeys along parallel lines. We do not cover vector proof in this unit however we build all the understanding of vectors so we are ready to look at vector proof in Year 11.
Ratios and Fractions	This unit builds on KS3 work on ratio and fractions, highlighting similarities and differences and links to other areas of maths including both algebra and geometry. The focus is on reasoning and understanding notation to support the solution of increasingly complex problems that include information presented in a variety of forms. The bar model is a key tool used to support representing and solving these problems and students should be familiar with this by now.
Percentages and interest	Although percentages are not specifically mentioned in the KS4 national curriculum, they feature heavily in GCSE papers and this block builds on the understanding gained in KS3. Calculator methods are encouraged throughout and are essential for repeated percentage change/growth and decay problems. Use of financial contexts is vital to this unit, helping students to maintain familiarity with the vocabulary they are unlikely to use outside school.
Probability	his block also builds on KS3 and provides a good context in which to revisit fraction arithmetic and conversion between fractions, decimals and percentages. Tables and Venn diagrams are revisited and the use of tree diagrams is developed at both tiers, with conditional probability being a key focus for students

Year 10 Mathematics – Pentecost Term

Collecting, represing and interpreting data	This unit builds on KS3 work on the collection, representation and use of summary statistics to describe data. Much of the content is familiar, both from previous study within and beyond mathematics (including Geography and Science) and from everyday life. The steps have been chosen to balance consolidation of existing knowledge with extending and deepening, particularly in terms of interpretation of results and evaluating and criticising statistical methods and diagrams. For students following Higher tier, there is additional content relating to continuous data including histograms, cumulative frequency diagrams, box plots and associated measures such as quartiles and the interquartile range. Again the emphasis with these topics should be on interpretation (particularly in making comparisons) and not just construction.
Non Calculator methods	This unit revises and builds on KS3 content for calculation. Mental methods and using number sense are to be encouraged alongside the formal methods for all four operations with integers, decimals and fractions. Where possible this should be covered through problems, particularly multi-step problems in preparation for GSCE. The limits of accuracy of truncation are explored and compared to rounding, and Higher tier students will look at all aspects of irrational numbers including surds.
Types of number and sequences	This block again mainly revises KS3 content, reviewing prime factorisation and associated number content such as HCF and LCM. Sequences is extended for Higher Tier to include surds and finding the formula for a quadratic sequence whilst those in foundation focus their attention on embedding finding the nth term of a linear sequence.
Indices and Roots	This block consolidates the previous two blocks focusing on understanding powers generally, and in particular in standard form. Negative and fractional indices are explored in detail. Again, much of this content will be familiar from KS3 so may take less time. To consolidate the index laws, these can be revisited in the next block when simplifying algebraic expressions
Manipulating expressions	This final unit of year 10 builds on the Autumn term learning of equations and inequalities, providing revision and reinforcement for Foundation tier students and an introduction to algebraic fractions for those following the Higher tier. This also allows all students to revise fraction arithmetic to keep their skills sharp. Algebraic argument and proof are considered, starting with identities and moving on to consider generalised number.