Progression Model - Year 7

Module Title: Algebraic thinking, place value and proportion	Module Title: Application of number and fractional thinking	Module Title: Lines, angles and reasoning with number
Learning Intent for this module: • The first week is used to explore sequences using diagrams and lists of numbers. Technology is used to display graphs to get students to understand the difference between linear and non-linear patterns. Calculators are used throughout so that number skills are not a barrier. Sequences are covered formally at a later date. • Function machines are used alongside bar models and letter notation. Single function machines are then linked to inverse operations before moving into two step machines and then abstract expressions. • Students are then introduced to the use of number machines to formally solve one and two step equations. Consideration of equivalence and the difference between equality is illustrated through collecting like terms • In this block, students will explore integers up to one billion and decimals to hundredths. Using and understanding number lines is key and explored in depth. Rounding to the nearest ten is developed alongside rounding to one significant figure. Topics from last term such as sequences and equations, will be interleaved into this block of teaching. • Building on the recent work on decimals, the key focus for the second half of this term is for students to gain a deep understanding of the links between fractions, decimals and percentages. Whilst looking at percentages, pie charts are introduced. The focus is very much on a secure understanding of the most common fractions under one.	Learning Intent for this module: • The focus on the first two weeks is building on the formal methods of addition and subtraction at KS2. All students will look at this in context of interpreting and solving problems. Problems are drawn from the contexts of perimeter, money, interpreting bar charts and tables. Calculators are used to check or support calculations with significant figures. • The rest of the term is dedicated to study multiplication and division both with and without a calculator. Unit conversions will be the main context as multiplication of 10,100 and 1000 are explored. • The short block focuses on the key concept of working out fractions and percentages of quantities and linking the two. • Students have limited exposure to directed number at KS2, so this block is to extend their prior knowledge and deepen their understanding. Multiple representations and contexts are used to appreciate the meaning behind operations with negative numbers rather than relying on a series of rules. • Fractional thinking builds on the first term of fractions, decimals and percentages. Bar models and diagrammatic representations are used to support this. Adding fractions with the same denominators will be restricted to cases where one is a multiple of the other.	Learning Intent for this Module: • Students will build on their KS2 skills using rulers, protractors and other measuring equipment to construct and measure increasingly complex diagrams using correct mathematical notation. Pie charts will be studied here to gain further practise at drawing and measuring angles. • The second block covers basic geometric language, names and properties of types of triangles and quadrilaterals, and the names of other polygons. Angle rules are introduced and used to form chains of reasoning • Students will review and extend their mental strategies with a focus on using a known fact to find other facts. The skills gained in working with number facts will be extended to known algebraic facts. • FDP equivalence will be revisited in the context of probability, where students will also be exposed to sets, set notation and systematic listing strategies. • Factors and multiples are revisited to introduce the concept of prime numbers, and the higher ability groups will include Venn diagrams. Odd, even, prime, square and triangular numbers will be used as the basis of forming testing conjectures.
Key Content to be learned: • Sequences • Understand and use algebraic notation • Equality and Equivalence	Key content to be learned: • Addition and Subtraction • Multiplication and Division • Fractions & Percentages of Amounts	Key Content to be learned: • Construction and Measuring • Geometric Reasoning • Developing Number Sense

• Place value and ordering integers and decimals • Fraction, decimal & percentage equivalence	• Operations and equations with directed number • Addition and subtractions of fractions	• Sets and Probability • Prime numbers and proof
Key tasks for this module: • Task 1 – Sequences and algebra • Task 2 – Equivalence and place value • Task 3 – Fractions/Decimals/Percentages • Task 4 – Write like a mathematician	Key tasks for this module: • Task 1 – Four operations • Task 2 – Fractions/percentage/equations • Task 3 – Add/sub fractions • Task 4 – Write like a mathematician	Key tasks for this module: • Task 1 – Constructions • Task 2 – Shape/Angle reasoning • Task 3 – Sets and probability • Task 4 – Write like a mathematician

Progression Model - Year 8

Module Title: Proportional reasoning and representations	Module Title: Algebraic techniques and developing number	Module Title: Developing geometry and data reasoning
Learning Intent for this module: • This unit focuses on the meaning of ratio and the various models that can be used to represent ratios. Based on this understanding, it moves onto sharing into a ratio using diagrammatic representations alongside the abstract methods. After this students look at simplifying and equivalent ratio as well as linking ratios with fractional parts. • When looking at multiplicative change, we use the previous units knowledge to link ratio with the concept of scaling. This involves proportion and conversion graphs. Links with maps are also made throughout, using contextualised problem solving whenever possible.	Learning Intent for this module: • Students will build on their experience of equivalence from Y7 and look at expanding and factorising a single bracket. All students will extend tier knowledge of solving equations to now involve brackets. Bar models are used to facilitate the understanding of those processes. Students will also learn to solve formal inequalities building on their solving equations skills. • Sequences are further built upon as students look at the inclusion of algebraic expressions. • Finally, in this block, students will look at expressions involving indices. The laws of indices will be covered further on in the year.	Learning Intent for this Module: • This unit builds on prior knowledge of angle notation from Y7, extending into parallel and complex missing angle problems. Links are then made to closely connect properties of polygons and quadrilaterals. • Having covered area in Y7, students are introduced and are encouraged to explore the area of trapezia and circles. • The teaching of reflection is split into rotation and translation to ensure students attain a deep understanding of the differences of the two. Students have the opportunity to revisit and enhance their knowledge of special triangles and quadrilaterals.

• Students from Y6 generally have little experience of multiplying and dividing fractions, in the last unit students will look at multiple representations so see what underpins algorithms. Once this link has been made, students will go through the formal techniques of multiplying and dividing fractions with an emphasis on understanding a reciprocal and its uses. • Building on the knowledge of co-ordinates at KS2, students looks formally at algebraic rules for straight lines. They explore the notation of gradient and intercepts. The main focus is drawing a straight line using a function, the interpretation of m and c from an equation is looked at further in Y9. • Students are introduced to the idea of linear correlation and look at the differences between discrete and continuous data. • From the Y7 content, students will further extend their ideas of probability, looking further into samples space diagrams and their uses.	• This unit focuses on the relationships between fractions and percentages, including decimal equivalents, and using these to calculate percentage increase and decrease. Financial maths is developed through contexts whenever possible. • Knowledge of standard form is introduced to the students in the form of powers of ten. The use on context is important to make students aware of the notation and its uses. • Lots of basic number skills will be revisited to support the recall for all students in a variety of contexts. Estimation is a key focus as well as the conversion of units of measure.	• Much of the statistic content in KS3 is a continuation of the work done in primary school. A particular focus in this unit is how to compare different distributions. There is an emphasis on exploring misleading graphs, the collection of data and criticising questionnaires. • Students have previously studied the mean and median earlier in KS3. At this stage students are introduced to the mode and when to apply each average in a given situation. • Consideration to outliers and considering what effect these have on measures are investigated.
Key Content to be learned: • Ratio and Scale • Multiplicative Change • Multiplying & Dividing Fractions • Working in the Cartesian Plane • Representing data • Tables and Probability	**Key content to be learned:** • Brackets, Equations & Inequalities • Sequence • Indices • Fractions and Percentages • Standard index form • Number Sense	**Key Content to be learned:** • Angles in parallel lines & polygons • Area of Trapezia and Circles • Line symmetry and reflection • The Data Handling Cycle • Measures of location
Key tasks for this module: • Task 1 – Ratio and scale (multiplicative techniques) • Task 2 – Multiply/Divide fractions • Task 3 – Working in the Cartesian plane and representing data • Task 4 – Write like a mathematician	**Key tasks for this module:** • Task 1 – Equations and inequalities • Task 2 – Sequences and Fractions/percentages • Task 3 – Standard form/ Indices • Task 4 – Write like a mathematician	**Key tasks for this module:** • Task 1 – Angles reasoning • Task 2 – Area of circles and trapezia • Task 3 – Line symmetry / Data handling • Task 4 – Write like a mathematician

Progression Model – Year 9

Module Title: Reasoning with Algebra and Construction	Module Title: Reasoning with Number and Geometry	Module Title: Reasoning with proportion and Representations
Learning Intent for this module: - The first block builds on Y8 content where the students plot simple straight line graphs. They now study $y = mx+c$ as the general form of the equation of a straight line, interpreting m and c in abstract and real life contexts. Higher topics will investigate inverse relationships. - Students revisit and extend their knowledge of forming and solving equations and inequalities. They explore rearranging formula, seeing how this links to solving equations and reinforcing their understanding of the algebraic terminology. - Testing conjectures give students the opportunity to revisit primes, factors and multiples, which provides an opportunity to make and test conjectures. As well as testing conjectures, students are encouraged to create and test their own. - Students are reminded about the associated vocabulary in relation to KS3. As well as surface area and volume, students will also explore plans and elevations. Higher strand students will investigate volumes of other 3D shapes. - Constructions and congruency builds on the constructions studied during Y7 and Y8 to look at the locus and standard constructions using a straight edge and a pair of compasses. - Congruency is also explored taking a practical approach before looking at the formal aspect of identifying congruent triangles.	Learning Intent for this module: - Students will develop their knowledge of the number system to include rational and real numbers. (Higher strands will look at simple surds). Standard form and HCF/LCM are also revisited. - All students will revise fractions from the previous block as well as looking at reverse percentage problems and repeated percentage change. - Students will practise their number skills in a number of financial contexts. Simple ideas of tax and wages are introduced. - Students will revise and extend their knowledge of angle rules and properties of shape, applying them to increasingly complex problems. The block looks at deduction from a geometric perspective. - Having studied line symmetry and reflection in Y8, students now look at rotational symmetry and rotation. They move on to study translations, which are described in vector form. - Squares and square roots are covered as a prerequisite to investigating the relationship between the sides of a right-angled triangle. Students explore using the theorem in a variety of context, including on coordinate axes, and a higher step is included using 3D shapes.	Learning Intent for this Module: - Students develop their knowledge to include enlargement, learning the mathematical meaning for similar. There is an opportunity to cover negative scale factors. Trigonometric ratios are investigates and using trigonometric ratios formally is introduced. - Building on previous experience of the topic, students formally study inverse proportion and if applicable will look at graphs of inverse relationships. - Students develop their knowledge of inverse relation ships to explore speed, distance and time in detail. Students go on to include other compound measures such as, density and pressure. - In this block, students build on their knowledge of calculating probabilities of single and combined events. The focus is to introduce independent events and the use of the multiplication rule. Students will look at a variety of diagrams to facilitate probability. - The first non-linear algebraic graph is explored, where students are encouraged to look for symmetry and read off x/y values. They also explore reciprocal and exponential graphs.

Key Content to be learned:	Key content to be learned:	Key Content to be learned:
• Straight line graphs • Forming and solving equations • Testing conjectures • Three-dimensional shapes • Constructions and congruency	• Number • Using percentages • Maths and money • Deduction • Rotation and translation • Pythagoras' Theorem	• Enlargement and similarity • Trigonometry with right angled triangles • Solving ratio & proportion problems • Rates • Probability • Algebraic representation
Key tasks for this module: • Task 1 – Solving equations/y=mx+c • Task 2 – Testing conjectures/3D shape • Task 3 – Constructions/Congruency • Task 4 – Write like a mathematician	Key tasks for this module: • Task 1 – Using Percentages • Task 2 – Money/Deduction problems • Task 3 – Transformations and Pythagoras' theorem • Task 4 – Write like a mathematician	Key tasks for this module: • Task 1 – Transformations and trigonometry (right-angled) • Task 2 – Ratio, proportion and rates • Task 3 – Probability / Algebraic representations • Task 4 – Write like a mathematician

Progression Model – Y10

Module Title:	Module Title:	Module Title:
Learning Intent for this module:	Learning Intent for this module:	Learning Intent for this Module:
Key Content to be learned: •	Key content to be learned: •	Key Content to be learned: •
Key tasks for this module: •	Key tasks for this module: •	Key tasks for this module: •

Progression Model – Y11

Module Title:	Module Title:	Module Title:
Learning Intent for this module:	Learning Intent for this module:	Learning Intent for this Module:
Key Content to be learned: •	Key content to be learned: •	Key Content to be learned: •
Key tasks for this module: •	Key tasks for this module: •	Key tasks for this module: •

Progression Model – Y12

Module Title:	Module Title:	Module Title:
Learning Intent for this module:	Learning Intent for this module:	Learning Intent for this Module:
Key Content to be learned: ●	Key content to be learned: ●	Key Content to be learned: ●
Key tasks for this module: ●	Key tasks for this module: ●	Key tasks for this module: ●

Progression Model – Y13

Module Title:	Module Title:	Module Title:
Learning Intent for this module:	Learning Intent for this module:	Learning Intent for this Module:
Key Content to be learned: •	Key content to be learned: •	Key Content to be learned: •
Key tasks for this module: •	Key tasks for this module: •	Key tasks for this module: •