Subject: **Maths** KS3 Curriculum Mapping

	Year 7	Year 8	Year 9
HT1	**Calculations** - Multiply and divide decimals by transposing them to integers first. - Add and subtract proper fractions and mixed numbers with different denominators and be able to predict if the answer will be greater or less than a whole. - Calculate a percentage of a quantity and solve simple interest problems. **The number system** - Order positive and negatives fractions and decimals. - Multiply and divide numbers by powers of 10 without a calculator. - Round numbers to 2 d.p. and 1 s.f.	**Calculations** - Multiplying and divide a fraction by an integer, by a unit fraction and by a general fraction - Solve problems involving calculating with negative numbers. - Increase and decrease a number by a % using a decimal or fraction multiplier. **The number system** - Convert improper and mixed fractions to decimals and percentages. - Estimate answers to check if an answer if of the correct size. - Use the answer to a given calculation to determine the answer to another.	**Calculations** - Use multipliers to solve problems involving repeated percentage change, compound interest and reverse percentages. - Convert between fractions, decimals and percentages to find the most appropriate method to use in a calculation. **The number system** - Solve problems involving numbers expressed in standard index form with and without a calculator. - Recognise that measurements given to the nearest whole unit may be inaccurate by up to half a unit in either direction.
HT2	**Indices** - Use index laws with numerical and algebraic expressions involving multiplication and division of integer powers. - Derive a formula from words or function machine and in simple cases, change its subject. - Rapidly recall and use square numbers up to 15 x 15 and their corresponding roots. - Derive a root from prime factors for larger numbers. **Equations and formulae** - Form and solve simple linear equations and inequalities with integer coefficients and represent their solutions on a number line or using set notation. - Manipulate algebraic expressions through factorising. - Understand the difference between expressions, equations, formulae and identities	**Indices** - Write functions from words and diagrams using function notation and substitute in positive and negative integers, fractions and decimals - Rearrange formulae expressed in algebraic form where the subject appears only once - Use and understand prime decomposition for LCM and HCF. **Equations and formulae** - Expand the product of two linear expressions and simplify - Factorise quadratic expressions by identifying a common factor - Solve fractional equations and equations with unknowns on both sides using balancing correctly	**Indices** - Understand that even powers and roots are always positive but odd can be positive or negative. - Substitute values into complex expressions and formulae involving powers and roots - Simplify algebraic expressions using multiplication and division of integer powers. - Use algebraic manipulation skills to prove simple identities (using 2n and 2n+1 to represent odd and even numbers) and multiples. **Equations and formulae** - Factorise and solve quadratic expressions including the difference of two squares. - Solve pairs of linear simultaneous equations through elimination and substitution.
HT3	**Proportion** - Understand and use common multiples when solving problems involving direct proportion. Share in a given ratio. - Understand and use fractions, decimals and percentages as multipliers when increasing and decreasing. - Simplify a ratio and write in the form 1:n or n:! and interpret scales and maps using ratio. **Mensuration** - Know and use formulae for area and perimeter of common triangles and quadrilaterals. - Find volumes of shapes made from cuboids.	**Proportion** - Use equality of ratios to solve problems and represent ratios as linear equations and draw their graphs. - Understand and use fractions, decimals and percentages as multipliers when calculating the original amount after a % change, including improper fractions. **Mensuration** - Derive, recall and use formulae for area and circumference of circles and parts of circles, using pi in exact calculations. - Change freely between standard and compound units. - Use compound measures such as speed and density.	**Proportion** - For problems involving direct and inverse proportion, write relationships and recognise graphs. **Mensuration** - Know and use formulae for volume and surface area of all prisms, pyramids, spheres and cones, including frustums. - Investigate Pythagoras' theorem, using a variety of media, through its historical and cultural roots, including 'picture' proofs.

HT4	**Graphs and sequences** - Draw and interpret real life graphs and graphs modelling real life situations. (EG distance /time) - Continue Fibonacci and geometric sequences given the common ratio (no surds). - Use the nth term to generate a quadratic sequence, including triangular numbers. **Transformations** - Understand congruence in the context of reflections, rotations and translations. - Translate shapes by a given column vector and describe translations using vector notation.	**Graphs and sequences** - Plot graphs of quadratic functions and identify their turning points, intercepts and lines of symmetry. - Understand y = mx + c represents a straight line and the effects of changing m and c, including interpreting the gradient as a rate of change and the y intercept as the starting value in a real life graph. - Use the intersection of graphs to solve linear simultaneous equations.	**Graphs and sequences** - Find gradient and intercept of line given in the form y = mx + c and other forms such as 3x + 2y = 12. - Find the equation of a line or the midpoint given two coordinates. - Find the equation of a line from a single coordinate and the equation of a parallel line. - Plot simple quadratic, cubic and reciprocal functions. Solve a quadratic by identifying its roots on a graph. **Transformations** - Recognise, visualise and construct enlargements using positive and fractional scale factors; identify the centre and scale factor of enlargement. - Understand and use column vectors. - Transform 2D shapes by a combination of reflection, rotation and translation including the use of vector notation. - Describe the resultant image as a **single** transformation.
HT5	**Angles** - Identify alternate angles and corresponding angles; calculate and use the sums of the interior and exterior angles of quadrilaterals, pentagons and hexagons; - Solve bearing problems using the parallel properties of the north line. **Probability** - Populate and interpret Venn diagrams. - Understand and use set notation with Venn diagrams including to describe and shade regions.	**Angles** - Solve problems using properties of angles, of parallel and intersecting lines, and of triangles and other polygons, justifying inferences and explaining reasoning with diagrams and text - Derive the sum of angles in a triangle - Use bearings to describe position and draw given bearings. **Probability** - Solve probability problems involving theoretical models and relative frequency and calculate expected outcomes. - Construct tree diagrams and write the probability on the branches.	**Angles** - Explore the angle and side ratios of equilateral and isosceles right angles triangles. - Use an understanding of similar shapes to find missing sides and angles within right angled triangles. - Know exact values of sin cos tan 30 45 60 and 90. **Probability** - Use Venn diagrams to solve problems with probability. - Use tree diagrams to calculate probabilities of successive or combined events. - Apply the AND/OR rule for combined or successive events.
HT6	**Statistics** - Calculate, use and interpret the statistical measures mode, median, mean and range for discrete data, including comparing distributions. - Interpret graphs representing real data, including pie charts and recognise misleading diagrams. **Constructions** - Construct triangles and other 2-D shapes using a ruler and a protractor, given information about their sides and angles	**Statistics** - Draw and interpret graphs including scatter graphs. Know that correlation does not mean causation. - Identify modal class and median class and estimate the mean of grouped data. - Draw conclusions from data and consider outliers when drawing these conclusions. **Constructions** - Use straight edge and compasses to produce standard constructions including the midpoint and perpendicular bisector of a line segment, the perpendicular from a point to a line, and the bisector of an angle.	**Statistics** - Select, construct and modify, on paper and using ICT suitable graphical representation to progress an enquiry including trends in time series and lines of best fit on scatter graphs. **Constructions** Understand and use SSS, SAS, ASA and RHS condition to prove the congruence of triangles - Use congruence to show that translations, reflections and rotations preserve length and angle. - Use standard constructions to create a scale drawing.