

Subject	Maths	Year Group	9			
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Scheme title	Introduction to probability	Linear simultaneous equations	Geometry of triangles	Geometrical applications of ratio & proportion	Quadratic expressions and equations	Reasoning with number
Purpose of scheme	Pupils will revisit number work from Year 7 to refresh their understanding of the connections of methods of calculating with fractions, decimals and percentages in preparation for their work on Probability. Pupils will then develop an understanding of how we can assign a numerical value to the likelihood of an event occurring.	To be able to manipulate equations including scaling, addition and subtraction of equations in order to derive solutions to a pair of equations that must be solved simultaneously. Pupils will then connect their understanding of solutions to linear equations in two variables to the coordinates of points that lie on their graphs.	Pupils will revisit angle theorems to calculate missing angles using chains of reasoning. They will then be introduced to the concept of Loci and using the properties of circles to find the locus of points. Next, pupils will use the properties of tilted squares to derive Pythagoras' Theorem and use this to solve problems.	Pupil's prior knowledge of ratio will be explored within the context of similar geometrical figures and enlargement. This will then be extended further by investigating the unit circle and using properties of similarity to calculate missing lengths in right angled triangles using trigonometric techniques. Pupils will then extend their understanding of enlarging shapes and investigate other geometrical transformations.	To revisit some of the algebraic strategies and techniques learned earlier in KS3 before extending this to look specifically at quadratic expressions and equations. Pupils will begin to look at quadratic graphs as well as common features of them such as turning points.	To revisit indices in more depth than in Year 7 and extend this to investigating the laws of indices. Pupils will then be introduced to the concept of standard form as a means of writing very large and very small numbers. Next, pupils will explore strategies to use decimal multipliers when calculating with percentages.
Knowledge in sequence	- FDP Review - Introduction to probability - Venn Diagrams	- Solving Algebraically - Solving Graphically	- Angles review - Constructions, congruence & loci - Pythagoras' Theorem	- Ratio review - Similarity & Enlargement - Introduction to Trigonometry - Transforming 2D Figures	- KS3 Algebra Review - Quadratic expressions & equations	- Indices - Standard Form - Percentages
Skills	- Investigate equivalence of fractions, decimals and percentages and use strategies to convert between them. - Calculate with all 4 operations on FDP including with mixed numbers and negative numbers. - Use the language of probability and the probability scale to describe the likelihood of an event occurring. - Calculate the theoretical probability of an event occurring. - Systematically list all outcomes and use sample space diagrams - Use frequency trees and two way tables to represent information and use these to calculate probabilities - Calculate the relative frequency of an event occurring - Organise sets of numbers into Venn Diagrams and use these to calculate probabilities - Use the appropriate language and notation of set theory	- Solve one step and two step equations - Experience different representations to model algebraic reasoning - Understand that scaling and rearranging equations preserves equivalence - Be able to use one equation to solve another equation in a system of equations - Understand that equations in systems of equations can be added and subtracted - Eliminate variables through addition and subtraction of variables - Eliminate variables through substitution of equations - Understand how linear equations can be represented graphically - Experience representing solutions as coordinates - Understand the coordinates of intersection of two linear graphs are their simultaneous solution	- Revisit prior angles knowledge from Year 7 and 8 - Understand that properties of circles can be used to draw the locus of points from a fixed point - Be able to construct perpendicular and angle bisectors - Use these constructions to solve geometrical problems - Understand congruency conditions for triangles - Identify when triangles are congruent - Use congruent triangles to prove other geometrical results - Understand that radical notation can be used to describe slanted, non-integer lengths - Be able to find any missing length in a right angled triangle by knowing that the square of the hypotenuse is equal to the sum of the squares of the two shorter sides - Identify opportunities to use Pythagoras' Theorem in different contexts	- Revisit ratio skills from Year 7 and Year 8 - Experience using scale factors and constants of proportionality and unit ratios to solve problems - Understand angles do not change and proportions remain constant in similar shapes - Find SF and COP and use them to find missing lengths - Understand the centre of enlargement determines the position of an enlarged shape - Understand the relationship between the area of an enlarged shape and the scale factor - Understand that every right angled triangle is similar to a right angled triangle drawn within the unit circle - Find the lengths of right angled triangles using a length and an angle - Find any angle in a right angled triangle when given two side lengths - Solve problems involving translation, rotation and reflection of geometrical figures	- Revisit algebraic conventions and skills from Year 7 - Understand that quadratics are expressions and equations that include a squared variable (and no higher order power) - Understand that the shape of a quadratic graph is different to a linear graph - Evaluate quadratic expressions for a given value and plot these on a graph - Understand that quadratics can be written in expanded form and factorised form	- Understand index notation and what it represents - Understand the three main index laws - Simplify expressions with indices involving the same base - Interpret and convert between numbers in standard form and ordinary form - Revisit percentage skills from earlier in the year - Use decimal multipliers to represent percentage change
Key words	Reciprocal, Probability, likelihood, impossible, certain, relative, frequency, theoretical, outcome, event	Equation, expression, variable, solve, linear, scale, substitute, coordinate, intersect, solution, simultaneous	Adjacent, sum, theorem, parallel, perpendicular, geometrical, construction, bisect, loci, region, hypotenuse	Ratio, equivalence, proportion, scale factor, constant of proportionality, enlarge, similar, congruent unit, trigonometry, sine, cosine, tangent, opposite, adjacent, hypotenuse, rearrange, formulae, translation, rotation, reflection, vector	Expression, equation, term, variable, substitute, power, quadratic, evaluate, linear, expand, factorise, root, intercept, plot	Index, indices, product, power, base, simplify, expression, estimate, root, convert, adjust, standard form, ordinary form, percentage, multiplier, exponential
End point	Pupils will have an understanding of the difference between theoretical probability and relative frequency. They will be able to systematically list outcomes using a sample space diagram and use these as well as other representations to calculate probabilities. Pupils will be able to sort information into a Venn Diagram and use this to calculate probabilities.	Pupils will be able to use pictorial representations to model the rearrangement and scaling of linear equations. Some pupils will be fluent in solving systems of linear equations by choosing appropriate methods. Pupils will have revisited the concept of plotting linear equations and extended this to finding intersection points to find simultaneous solutions.	Pupils will be able to use mathematical equipment to find the locus of points within a given context. Pupils will then have experienced solving problems with Pythagoras' Theorem and some will have deepened this to consider 3D figures.	Pupils will be able to connect their understanding of proportional reasoning to geometrical contexts. They should be proficient in finding missing lengths in similar figures and enlarging shapes on the Cartesian Plane. Pupils should have experienced trigonometrical reasoning, and some will be able to rearrange trigonometric formulae.	Pupils will have had the opportunity to deepen their understanding of algebraic conventions they first met in Year 7. They will have experienced manipulating quadratic as well as linear expressions and they will have developed strategies and be able to connect these to prior learning on distributivity. Pupils should be able to find solutions to both quadratic and linear equations and be able to represent these solutions graphically.	Pupils will have developed an understanding of the laws of indices and be able to apply these to simplify expressions. Pupils will be fluent in converting between standard form and ordinary form and some will be able to calculate in standard form. Pupils will have developed a range of strategies to solve problems involving percentages.
Assessment Methods	Termly assessment to take place in Autumn 2		Termly assessment to take place in Spring 2		Termly assessment to take place in Summer 2	