

Subject	Maths	Year Group	7			
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Scheme title	Making generalisations about the number system 1	Making generalisations about the number system 2	Algebra and 2D geometry	The Cartesian plane and 2D geometry	Conceptualising and calculating with fractions	Ratio & proportion
Purpose of scheme	To develop understanding of the base 10 number system and the underlying structure of arithmetic. Pupils will explore properties of numbers using pictorial representations for concepts such as factors and multiples.	To continue to develop pupils understanding of number by considering the hierarchy of operations and through conceptualising and calculating with negative numbers. Much of this will lay the foundations for when pupils begin to generalise arithmetic and work algebraically.	To understand that algebra is used to express mathematical structures. To make connections between the concept of angles as a measure of turn and the concept of equality and inequality. Pupils will also explore the different types of symmetries and how 2D shapes can be classified.	To understand how the properties of circles can be used to construct triangles and then extend this to quadrilaterals. Pupils will also be introduced to the concept of a coordinate being a pair of values that determine the distance travelled from the origin. Pupils will also be re-introduced to the concepts of area and perimeter and develop their dimensional thinking skills.	Pupils will use prime factor decomposition to develop strategies to identify the highest common factor and lowest common multiple of pairs of numbers. Pupils will use these skills when exploring the concept of equivalence of fractions. This will lay the foundations for when pupils are able to manipulate and calculate with fractions.	Pupils are introduced to ratio using a pictorial approach. Much of the work here lays the foundations for proportional reasoning in KS4. Pupils will then spend time securing the foundations of percentages.
Knowledge in sequence	- Place value - Axioms & arrays - Factors & multiples	- Order of operations - Positive & negative numbers	- Expressions & equations - Angles - Classifying 2D Shapes	- Constructing triangles & quadrilaterals - Coordinates - Area of 2D Shapes	- Prime factor decomposition - Conceptualising and comparing fractions - Calculating with fractions	- Ratio - Percentages
Skills	- Understand place value for integers and decimals - Exchange between place value columns - Represent multiplication through a variety of models - Compare and connect calculations and representations of distributivity and associativity - Understand the factor properties of integers, prime numbers and square numbers - List factors of integers - List and organise common multiples of integers	- Write calculations as function machines and written calculations - Calculate with squares and square roots - Evaluate calculations with a combination of operations by considering the priority of operations - Use the number line as a model for ordering positive and negative numbers - Know the absolute value of a number is its distance from zero - Be able to perform the four operations with negative numbers	- Use and interpret algebraic notation - Form expressions from function machines - Substitute variables to evaluate expressions - Understand and use the terms, expression, equation, variable and term - Simplify a linear expression - Use the distributive property in order to expand a single bracket - Factorise an expression - Form simple equations and be able to manipulate equations in order to preserve equality - Be able to classify angles - Use a protractor to measure and draw angles - Use basic angle facts to calculate missing angles - Find the order of rotational symmetry of a polygon - Find the number of lines of symmetry of a polygon - Be able to classify triangles and quadrilaterals by their properties - Be able to calculate missing angles in triangles and	- Label the key elements of a circle - Draw circles with a given radius using a compass - Construct triangles and quadrilaterals using a protractor or a compass - Identify and plot coordinates in all four quadrants - Identify the midpoint of horizontal and vertical lines - State the equation of a horizontal and vertical line - Use geometrical properties to solve problems on coordinate axes - Understand perimeter as the length of the boundary around a shape - Use informal counting strategies to calculate the area of a shape - Calculate the area of rectangles, parallelograms and triangles - Calculate the area of rectilinear and compound shapes	- Express integers in index notation - Express an integer as a product of its prime factors - Find the HCF and LCM of a pair of numbers by a listing strategy and a Venn Diagram strategy - Represent a fraction pictorially - Convert between mixed numbers and improper fractions - Find fractions of amounts - Understand the concept of equivalent fractions - Compare and order fractions by considering decimal equivalency - Use models to represent multiplication and division with fractions - Add and subtract fractions with like and unlike denominators - Make links to decimals and percentages	- Use ratio notation to describe a relationship between two values - Scale ratios to find equivalent ratios - Simplify ratios - Identify a constant of proportionality between parts - Use ratio tables to spot multiplicative relationships - Share into a ratio using a bar model - Identify fractions, decimals and percentages on a number line - Represent percentages as their decimal equivalents - Calculate simple percentages of amounts
Key words	Exchange, product, sum, difference, integer, axiom, array, commutative, associative, distributive, factor, multiple, prime	Priority, equivalent, operation, absolute value, negative, sum, product, scale, translation, additive inverse, function	Variable, expression, equation, substitute, expand, factorise, simplify, acute, obtuse, reflex, isosceles, equilateral, scalene, quadrilateral, symmetry, vertex, parallel, perpendicular, rotate	Radius, diameter, chord, circumference, arc, quadrilateral, construct, isosceles, equilateral, rhombus, parallelogram, coordinate, axis, quadrant, midpoint, line segment, equidistant, area, perimeter, perpendicular, unit	Prime, factor, decompose, indices, product, multiple, vinculum, numerator, denominator, share, equivalent, simplify, product, sum	Ratio, proportion, multiplicative, scale, constant, equivalent, share, convert, percentage
End point	All pupils will have looked explored the base 10 system using the 'exploding dots' representation. All pupils should know the difference between factors and multiples and be familiar with the concept of an array to demonstrate these.	Pupils will have an understanding of the priority of operations within a calculation. Pupils should be fluent in calculating with negative numbers and be able to make links to scaling, arrays and translations.	Pupils will be able to demonstrate emerging algebraic fluency by manipulating expressions. Representations such as arrays, place value tiles and number line models will have been re-visited and explored in an algebraic context. All pupils will be reminded of the basic properties of angles and be able to apply these to find missing angles. Pupils will be able to classify quadrilaterals by their properties.	Pupils will be able to accurately construct triangles and quadrilaterals based upon their understanding of their properties. Pupils will also have an understanding of a coordinate as an ordered pair of values. Pupils should be proficient in calculating the area and perimeter of triangles and quadrilaterals.	Pupils should be fluent in prime factor decomposition and apply this to find the HCF & LCM of any pair of numbers. Pupils should be able to connect pictorial representations to the concept and calculation of fractions.	Pupils should be familiar with the concepts of scale factor and constant of proportionality with regards to equivalent ratios. Pupils should also be able to demonstrate an understanding of the relationship between fractions, decimals and percentages and use this to calculate simple percentages of amounts.
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	