Year 7 Mathematics Curriculum Plan							
Unit	Core		Hinterland		NC Coverage	Assessment	Whole Education Opportunities
	Knowledge	Skills	Knowledge	Skills			
Manipulative month	• Represent numbers on a 100 grid • Sequences • Directed Numbers • Algebra- Collecting Like terms • Solving One and Two Step Equations • Distributive Laws	• Find the next terms in a sequence and work out term-to-term rules • Use zero-pairs to calculate with directed number • Use the bar model/ function machines to solve one and two-step equations	• Be able to use different mastery methods to explore concepts such as counters, bar models, function machines	• Evaluate the different mastery methods		• Teacher questioning during lessons. • Regular formative assessment during lessons • Retrieval starters	• Developing a foundational understanding of mathematical concepts that will enable students to progress into KS3 from KS2
Place value and ordering integers and decimals.	• Work with number lines to position integers and intervals • Understand place value for decimals and position on a number line • Recognise place value of any number up to a billion	• Compare two numbers using <, >, = • Round integers to the nearest power of 10 • Order a set of integers • Find the range and median for a set of numbers • Write numbers in standard form (positive integers and decimals) • Round numbers to significant figures	• Links to Real-Life maths with finances and money • Links to science with the mass of planets and distances to planets	• Calculate with money in multi-step problems. • Tackling worded problems such as the mass of planets using standard form	3sn1 3sn4 3sn13 3sn7 3wd1 3sn 3sn2 3sn4	• Review of prior learning • Formative assessment during lessons • Low stakes end of unit test (20 marks) • Teacher questioning during lessons	• Links to science and their practical experiments e.g., measuring and recording data. • Links to geography with standard form e.g. populations and temperatures
Understand and use algebraic notation	• Understand the use of algebraic notation and the different representations. • Move freely between different numerical, algebraic, graphical and diagrammatical representations • Recognise and use relationships between operations including inverse operations	• Find the output of a function machine (numeric and algebraic) • Use diagrams and letters with one and two-step function machines • Use inverse operations to find the input given the output. • Substitute values into single and two-step expressions. • Generate sequences given an algebraic rule • Represent functions graphically.	• Links to algorithms in the computing sector and software's • Explore the history of algebra e.g., Muhammad ibn Musa al-Khwarizmi to understand the discoveries from around the world	• Turn a worded problem into an algebraic representation to work out an answer • Use of directed numbers and powers with algebra	3SA1a 3SA1b 3SA1c 3SA1d 3SA1e 3SA1f 3SA24a	• Review of prior learning • Formative assessment during lessons • Low stakes end of unit test (20 marks) • Teacher questioning during lessons	• Explore history and development of algebra and numerical representation in various civilisations
Fractions, decimal and percentage equivalence.	• Understand the meaning of percentage using a hundred square. • Convert fluently between fractions,	• Represent tenths and hundredths as diagrams and on number lines. • Convert between fractions and decimals	• Use of Percentages in real life contexts such as sales and finances/investments • History of Fractions from Egypt	• Calculate with percentages in real life and understand the contextual application. • Using fractions, decimals and	3SR3 3SN4	• Review of prior learning • Formative assessment during lessons • Low stakes end of unit test (20 marks)	• Links to catering and food science with measurements and equivalents

	decimals and percentages. • Represent any fraction as a diagram and on a number line • Explore fractions, decimals and percentages above 1	(tenths, hundredths, fifths, quarters, eights and thousandths) • Use and interpret pie charts.		percentage interchangeably in the same question to show deep understanding		• Teacher questioning during lessons	• Links to science with use of decimals and percentages • Links to economics and business with use of percentages with money and finances
Sequences, Equality and Equivalence Recap	• Make and test conjectures about patterns and relationships • Recognise arithmetic, geometric and other sequences that arise. • Understand the meaning of like and unlike terms • Understand the meaning of Equality • Use algebraic methods to solve linear equations	• Simplify and manipulate algebraic expressions through collecting like terms • Use approximation through rounding to estimate answers • Use fact families numerically and algebraically. • Solve linear equations using all operations.	• Explore and research Fibonacci and the Fibonacci Sequence/ Golden Ratio • Make links between everyday scenarios and algebra such as shopping e.g., bulk buys and finding the unit price	• Identify and work with different types of sequences. • Use different mastery methods to solve equations such as the bar model and/or function machines •		• Review of prior learning • Formative assessment during lessons • Low stakes end of unit test (20 marks) • Teacher questioning during lessons	• Explore how the Fibonacci Sequence is found in real life- links to STEAM • Golden Ratio and how this links to the human body (Science)
Developing Number Sense & Solving problems with the Four Operations.	• Know and use addition, subtraction, multiplication and division strategies for integers and decimals. • Understand and Use factors and multiples. • Use estimation for checking calculations • Convert between metric units • Understand and use Orders of Operations	• Solve problems in the context of perimeter • Solve financial maths problems. • Solve problems involving tables and timetables. • Solve problems with frequency trees, bar charts and line charts. • Multiply and divide by powers of 10 • Solve problems with the are of rectangles, parallelograms, triangles and trapezia • Solve problems using the mean • Explore multiplication and division with algebraic expressions	• Explore the history of Brahmagupta (Indian Mathematician) who invented rules for Addition, Subtraction and Multiplication	• Links to real-life contexts with area and perimeter problems e.g. finding the area and perimeter of a field • Real- life of train and bus timetables to plan a journey. • Financial maths problems such as working out profits, working with a bank statement and working out change		• Review of prior learning • Formative assessment during lessons • Low stakes end of unit test (20 marks) • Teacher questioning during lessons	• Links to real-life finances such as budgeting • Links to Science with the use and representation of Bar Charts and Line Graphs for data
Fractions and Percentages of Amounts & Operations and Equations with Directed Numbers	• Understand the links between Fractions and Percentages • Understand and use representations of directed numbers	• Find a fraction of an amount. • Find a percentage of an amount with and without a calculator.	• Links to Fractals in nature and the Golden ratio • Use of Percentages in real life contexts such as sales and finances/investments	• Explore the different contexts of fractions and percentages in real-life e.g. sales in shops, finances and calculate answers		• Review of prior learning • Formative assessment during lessons • Low stakes end of unit test (20 marks)	• Links to Scientific Formulae • Links to Geography with temperatures and elevations

		• Order directed numbers on number lines and using symbols • Add and subtract with directed numbers • Multiply and divide with directed numbers • Solve one and two-step equations involving directed numbers. • Use order of operations with directed numbers • Explore powers and roots of positive numbers	• History of Fractions from Egypt • Explore the history of Brahmagupta (Indian Mathematician) who invented rules for Addition, Subtraction and Multiplication • Explore the Origins of Directed Numbers which trace back to China	• Use different mastery methods to calculate with negative numbers e.g., number lines and counters. • Link previous methods to solve equations with the use of directed numbers e.g., bar models and function machines		• Teacher questioning during lessons	
Addition and Subtraction of fractions	• Understand representations of Fractions • Understand and use Equivalent Fractions • Be able to use factors and multiples of numbers • Understand and use the link between fractions and decimal equivalents	• Convert between mixed numbers and fractions • Add and Subtract fractions with the same denominator. • Add and Subtract fractions with different denominators. • Add and Subtract improper and mixed fractions • Use fractions in algebraic contexts • Add and subtract simple algebraic fractions • Add fractions and decimals	• Research Simon Stevin who was one of the first to write about decimals and fractions • Explore use of fractions in everyday life such as recipes and proportion	• Use different representations to calculate with fractions such a bar models and number lines. • Be able to decide whether it is best to work in fractions or decimals based on the question		• Review of prior learning • Formative assessment during lessons • Low stakes end of unit test (20 marks) • Teacher questioning during lessons	• Links to Science with the use of decimals and fractions
Constructing, Measuring and Using Geometric Notation.	• Understand and use letter and labelling conventions • Understand angles as a measure of turn • Be able to classify angles • Recognise types of triangles and quadrilaterals • Identify polygons up to a decagon. • Work with a Pie chart	• Draw and measure line segments including from geometric figures • Draw and measure angles between 180 and 360 degrees • Identify parallel and perpendicular lines • Construct triangles using SSS, SAS, ASA • Construct more complex polygons • Interpret pie charts using proportion and pie charts. • Draw a pie chart	• Links to construction in Art and DT with constructing accurate triangles and polygons	• Know how to use equipment to measure angles and construct a pie chart • Understand and use the geometric notation such as Angle ABC in order to solve problems		• Review of prior learning • Formative assessment during lessons • Low stakes end of unit test (20 marks) • Teacher questioning during lessons	• Links to Art and Design Technology e.g. angles, constructing and using shapes • Links to Geography with angles e.g,, use of Compass and directions
Developing Geometric Reasoning.	• Understand and use sum of angles at a point and on a straight line	• Solve angle problems using properties of	• Links to Islamic Art and tessellations	• Problem solve with angles in different		• Review of prior learning	• Links to Art and Design Technology e.g. angles and parallel lines

	• Understand and use the equality of vertically opposite angles • Know and apply the sum of angles in a triangle and quadrilateral. • Investigate angles in parallel lines	triangles and quadrilaterals. • Solve complex angle problems e.g. polygons. • Understand and use angles in parallel lines rules (alternate, corresponding, co-interior)	• Links to Architecture, Planning and building e.g., The Louvre, The Shard, bridges • Links to Euclid (Father of Geometry)	contexts by combining rules and concepts		• Formative assessment during lessons • Low stakes end of unit test (20 marks) • Teacher questioning during lessons	
Sets and Probability	• Identify and represent sets • Know and use the vocabulary of probability • Know the sum of probabilities of all possible outcomes is 1	• Understand and use the probability scale • Interpret and create Venn diagrams • Understand and use the intersection and union of sets • Generate a sample space for single events • Calculate the probability of single events	• Links to odds of events happening in everyday context. • Travel – planning a journey or Pilots making decisions. • Links to everyday risk analysis • Research on Pascal who invented one of the first mechanical calculators as well as Pascals Triangle	• Be able to represent any context as a Venn Diagram to work out a probability. • Understand that probability can be given as a fraction, decimal or percentages and know the most appropriate form to use depending on the question	3SP1 3SS1 3WD5 3SA4c	• Review of prior learning • Formative assessment in lessons • Low stakes end of unit test (20 marks) • Teacher questioning during lessons	• Links with Accounting and Finance e.g., taking risks
Prime Number and Proof	• Find and use multiples and factors of a number • Recognise and identify square and triangular numbers • Recognise and identify prime numbers	• Find common factors for a set of numbers including the HCF • Find common multiples of numbers including the LCM • Write a number as a product of its prime factors • Use a Venn Diagram to calculate the HCF and LCM • Make a test conjectures and use counterexamples to disprove a conjecture	• The Sieve of Eratosthenes is a method for finding prime numbers by repeatedly eliminating numbers that are not prime. • Link of Prime Numbers in computing, software and algorithms	• Problem solving with factors and multiples using different methods such as listing vs. prime factors and Venn diagrams. • Decide and evaluate which method will be most appropriate depending on the question.	SN3 3SN8 3SN13 4SN5	• Review of prior learning • Formative assessment in lessons • Low stakes end of unit test (20 marks) • Teacher questioning during lessons	• Links to whole curriculum skills of being able to prove a statement or to disprove • Link of Prime Numbers in computing, software and algorithms

Hinterland:

- *increasing depth: niche details about a particular area of study that deepen and enrich the core.*
- *increasing breath: wider surveys across the domain of any curriculum area that help to locate any specific core element within a wider frame.*
  'here is the a whole set of knowledge and ideas we might explore… we are going to focus here and here but the rest is out there to think about too.'

https://nrich.maths.org/famous-mathematicians