FRAMEWORK FOR LEARNING

CHS South

CREATIVE	An education where imagination, curiosity and resilience enable us to ignite our learning.
HAPPY	A shared belief that optimism, empathy and responsibility are the foundations for a respectful, safe and inclusive community.
SUCCESSFUL	Individuals who are ready to learn, practise being reflective, and are motivated to become champions.

SUBJECT: Maths

INTENT

"Without mathematics, there's nothing you can do. Everything around you is mathematics. Everything around you is numbers." - **Shakuntala Devi**

Maths is a universal language that explains the world around us. The study of Mathematics enables you to make sense of everyday situations, forge links between topics and establish connections to real life context. Maths fosters curiosity, equipping students with various strategies to tackle problems; it empowers students with resilience to take risks, get it wrong, form a new strategy and start again, with determination and drive to reach the final answer. Maths is logical thinking, reasoning, intuition, analysis, construction, generalisation and beauty.

CHS SOUTH - CURRICULUM - FRAMEWORK FOR LEARNING

YEAR GROUP	YEAR 7
RATIONAL / NARRATIVE	Working on a range of topics, through a mastery approach, students will have the opportunity to work to consolidate and extend their existing skills from primary school, in order to apply these to more complex situations. Through a four-part lesson structure, students have the opportunity to discuss multiple methods for a given problem and start to develop their evaluative skills in assessing which methods are more appropriate for a given task.

TERM	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
KNOWLEDGE	<u>Sequences, Algebraic Thinking and Equality and Equivalence</u> • Linear and non-linear sequences. • Function machines. • Substitution. • Generating sequences from a rule. • Solving one-step and two-step equations • Collecting like terms.	<u>Place Value and Fraction, decimal and Percentage Equivalence</u> • Place value. • Ordering Numbers. • Range. • Median. • Rounding. • Fractions, decimal and percentage equivalence. • Interpreting pie charts. <u>Application of Number</u> • Addition and subtraction of integers and decimals. • Perimeter of shapes. • Frequency trees. • Two Tables. • Financial Problems.	<u>Application of Number cont'd</u> • Multiplying by powers of ten. • Multiplying and Dividing Integers and Decimals. • Factors and multiples. • Areas of triangles, rectangles and parallelograms. • Finding the mean. • Fractions and percentages of amounts. • Order of operations. <u>Directed Number</u> • Ordering negative numbers. • Calculations with negative numbers. • Using negative numbers in previous topics learnt.	<u>Fractional Thinking</u> • Adding and subtracting fractions with common and different denominators. • Manipulate mixed numbers and improper fractions. • Adding and subtracting simple algebraic fractions. <u>Lines and Angles</u> • Measuring and drawing lines and angles. • Properties of triangles, quadrilaterals and other polygons. • Drawing angles and triangles, given certain criteria (SSS, SAS, ASA). • Drawing and interpreting pie charts.	<u>Geometric Reasoning</u> • Calculate angles at a point, on a straight line and vertically opposite angles. • Calculate missing angles in triangles and quadrilaterals. • Angles in polygons • Multi-step angle problems. <u>Developing Number Sense</u> • Use of mental methods for four operations for integers, decimals and fractions. • Using factors to simplify calculations. • Using estimation as a method for checking calculations.	<u>Sets and Probability</u> • Identify and represent sets and Venn diagrams. • Create and use sample spaces. • Calculate the probability of a single event. <u>Prime Numbers and Proof</u> • Identify types of numbers, including prime, triangular, square and cube numbers. • Highest Common Factor (HCF) and Lowest Common Multiple (LCM). • Prime factor decomposition. • Simple mathematical proofs.
SKILLS	<u>Exploring Sequences</u> Describe and continue sequences in diagram and number forms. Explore linear and non-linear sequences.	<u>Place Value</u> Understand the number system and place value to include decimals. Order positive and negative integers, fractions, and decimals,	<u>Application of number</u> Use formal written methods applied to positive integers and decimals. Recognise and use inverse operations.	<u>Fractional Thinking</u> Move between numerical, graphical and diagrammatical representations (e.g., for fractions, decimals and percentages).	<u>Geometric Reasoning</u> Describe, sketch and draw 2D shapes with standard conventions; parallel lines, right angles, hatch marks to indicate equality.	<u>Sets and Probability</u> Use appropriate language and the 0-1 probability scale. Understand that all probabilities add to 1.

	<u>Understanding and Using Algebraic Notation</u> Use a variety of representations to explore algebraic notation. Form and substitute into expressions, including generating sequences. <u>Equality and Equivalence</u> Understand the idea of equivalence. Form and solve equations. Understand 'like terms' and be able to simplify expressions.	using representations such as number lines. Use the symbols =, ≠, ≤, ≥, < and > Round numbers to an appropriate degree of accuracy. Interpret the median and the range in a given context. Interpret and compare numbers in standard form. <u>Fraction, decimal and Percentage Equivalence</u> Move freely between different numerical representations of fractions, decimals and percentages. Express one quantity as a fraction of another. Compare two quantities using percentages. Use knowledge of fractions to interpret pie charts.	Derive and apply formulae to calculate and solve problems involving perimeter and area of triangles, parallelograms and trapezia. Construct and interpret tables, charts and diagrams. Derive and apply formulae to calculate. Describe and interpret the mean. Calculate percentages and fractions of amounts. <u>Directed Number</u> Use of the four operations, extending this to negative numbers. Use square and square roots, applying this to negative numbers. Substitute numerical values into formulae and expressions including scientific formulae.	Order positive and negative integers, decimals and fractions. Convert between mixed and improper fractions. Express a quantity as a fraction of another, where the fraction is less than or greater than one. Extend the use of four operations to include fractions. Work interchangeably between terminating decimals and fractions. <u>Lines and Angles</u> Draw and measure lines and angles using a protractor. Understand standard conventions for labelling lines and angles. Use language and properties precisely to analyse or classify 2D shapes.	Understand and use angles facts and properties of triangles and other polygons to solve increasingly complex problems. <u>Developing Number Sense</u> Select and use appropriate calculation strategies, including mental and formal written methods.	Use tables, grids and Venn diagrams to categorise data in a systematic way. <u>Prime Numbers and Proof</u> Use the concepts and vocabulary of prime numbers, factors and multiple. Use the unique factorisation property. Use integer powers (squares, cubes and higher) and their associated real roots. Recognise powers and 2,3,4, and 5.
ASSESSMENT	3 x End of Unit Assessments	3 x End of Unit Assessments	2 x End of Unit Assessments 1 x Spring Progress Test	3 x End of Unit Assessments	3 x End of Unit Assessments	2 x End of Unit Assessments 1 x Summer Progress Test
HOME LEARNING	Weekly assessments set on Sparx Maths VLE based on Y6 expected topics	Weekly assessments set on Sparx Maths VLE based on previous half term topics	Weekly assessments set on Sparx Maths VLE based on previous half term topics	Weekly assessments set on Sparx Maths VLE based on previous half term topics	Weekly assessments set on Sparx Maths VLE based on previous half term topics	Weekly assessments set on Sparx Maths VLE based on previous half term topics
READING, WRITING, TALK, NUMERACY	During 'Anchor Tasks' students are asked to write a journal to document their methods and evaluate other students' methods, describing the limitations of each. Students are encouraged to discuss and present	During one session in this half term, students will peer-assess each other's journals, providing the opportunity to identify areas of strength and weakness, thereby developing their own evaluative skills.	Use of the reading strategy 'Form Opinions' - students are encouraged to develop their journaling skills by evaluating which methods are the most efficient when solving a problem.	Correct use of mathematical vocabulary is developed through tasks in which students need to firstly describe their solution to a problem using annotations only, with no discussion. Then they need to describe their	Students are encouraged to reason using the correct angle facts and make use of them in their written methods, using precise vocabulary. Use of the reading strategy 'Visualisation' - students are provided with clues involving the	Use of the reading strategy 'Breaking Down Information' – students are encouraged to break down worded questions into smaller parts or identify and exploring key words that are vital in establishing what mathematical skills need

	their methods for their Anchor Task, both to their partner and the rest of the class and through participation in class discussion.	Use of the reading strategy 'Predict' – showing students a mathematical image and predicting what area of Maths it relates to - what could the question be asking them?		solution using only using mathematical vocabulary and full sentences, the aim being for students to really focus upon the language that they use.	properties of 2D shapes and are asked to use the clues to visualise and subsequently draw the correct 2D shape with correct dimensions.	to be used to solve a problem.
TIER 2 VOCABULARY	Balance (algebra), Choose, Compare, Define, Discuss, Explain, Find, Function	Balance (financial), Calculate, Complete, Evaluate, Finance, Income, Percent, Significant	Area, Data, Factor, Formula, Method, Process	Create, Debate, Draw, State	Describe, Estimate, Outline	List, Select, Summarise
TIER 3 VOCABULARY	Linear, non-linear, arithmetic, geometric, Fibonacci, expressions, equations, input, output, solve, simplify, substitute, 'like' terms.	Integers, decimals, difference, terminating decimals, recurring decimals, approximate, rounding, equivalent, percentage, range, median, index, improper, convert.	Integers, commutative, associative, partition, divisor, dividend, perimeter, product, perpendicular, multiples, highest common factor, lowest common multiple, parallelogram, loss, credit, sea-level, positive, negative, zero.	Acute, obtuse, reflex, adjacent, vertically opposite, isosceles, quadrilateral, fractions percentages.	Polygon, regular, alternate, corresponding, co-interior, supplementary, parallel, perpendicular.	Squared, cubed, triangular numbers, prime, prime factor decomposition, union/intersection, conjecture, systematic, counter example.
PSPSMC, BRITISH VALUES AND DIVERSITY	<u>British Values</u> are promoted through the nature of our lesson structure. Students are encouraged to share their views and listen attentively and respectfully to that of others. Values are re-iterated through classroom rules. <u>Cultural</u> mathematical sequences such as Fibonacci are explored with links made to where these sequences appear in nature. <u>Social</u>	<u>Personal</u> students are encouraged to develop a positive mind-set when problem solving or learning to cope with new methods. <u>Social</u> Topic introductions explore 10 ways in which you may use FDP in real life. Students watch a TedTalk on how multiplication in the world around us. <u>Diversity</u> Explore different number systems, and how the modern western number system comes from Arabic numerals.	<u>Personal</u> explore how area and perimeter are used extensively through real-life contexts such as DIY, gardening. Exploring which polygon gives the most area for the least perimeter. Links to careers applications. <u>Economic well-being</u> Making links between negative numbers and debt. <u>Cultural</u> When did negative numbers appear? Why did they need to be invented? Nrich Task.	<u>Morals</u> Exploring the various meanings behind fractions and sharing amounts equally, or in a way that is fair. <u>Social</u> Developing self-awareness and the ability to support other students allows effective use of self and peer reviewing to be used, which enables students to have an accurate understanding of their strengths and weaknesses.	<u>Cultural</u> Exploration of the mathematics behind famous pieces of art are explored during this topic. <u>Social</u> Through a topic introduction, students explore the new CHS South building and why constructions in Maths is such an important topic in the building sector.	<u>Economic well-being</u> How are prime factors used to keep online transactions secure. <u>Cultural</u> Learning about probabilities of events happening in real life. Srinivasa Ramanujan: Indian mathematician who discovered many famous mathematical proofs.

	Topic Introductions explore a number of jobs in which algebra is used, such as engineers, business analysists and architects. <u>Cultural</u> why do we use *x*? Explore the different cultures that developed our algebraic notation. <u>Diversity</u> Muhammad ibn Musa al-Khwarizm: Arabic Mathematician, who is credited as the father of algebra.		<u>Diversity</u> A topic introduction focuses on Alan Turing: LGBTQ+ icon, invented first modern computer. <u>Cultural</u> Explore different cultures ways of written arithmetic: Chinese lattice method, column method comes from India.			