SJBC Curriculum Termly Plan: Y10 Maths

Term	Topic(s) and links to other subjects	Core Knowledge	Core Vocabulary	Assessment	Resources
Autumn 1	Graphs and sequences	This half term, students will learn how to draw and understand graphs and number patterns. They will also work with shapes to find area and volume. Students will practice using math's in real-life situations, such as money problems and measurements. They will build skills in algebra and learn how to use formulas. These topics are also connected to Science, Technology, and Computing. Students should be able to: • Plot and identify coordinates in all four quadrants of the coordinate grid. • Identify geometrical information about coordinates e.g. midpoint of a line • Plot horizontal and vertical lines e.g. $yy = 3, xx = -2$ • Plot graphs of linear function using a table of values e.g. $yy = 2xx, yy = xx - 1, yy = 3xx - 1$ • Draw and interpret speed, distance time graphs and other real life graphs. • Solve simultaneous equations graphically. • Understand and use the equation $y = mx + c$,and understand properties of parallel lines and their gradients • Identify key points on graphs ***Possible Extension:*** • *Sketch graphs based on their equations* • *Know the equation of a circle*	➢ Quadrant ➢ Coordinates ➢ Linear ➢ Gradient ➢ Y-intercept ➢ Linear graph ➢ Parallel	Common topics test x 3	**Core resources:** Sparx Mathsgenie.co.uk Youtube **Enrichment and extension resources:** www.examq.co.uk

	Measurements and shape geometry Ratios and percentages	Students should be able to: • Recognize the nets of 3D shapes • Measure lines to the nearest millimeter • Find the perimeter of 2D shapes and apply this. • Find and apply the area of 2D shapes including squares, rectangles, triangles, parallelogram, trapezium and compound shapes. • Find the area of a circle, and recall the different parts of a circle. • Find the volume of 3D shapes and L-shaped prisms. • Find the area and circumference of a circle, semi and quarter circles, and compound shapes involving circles • Find the volume of cylinders • Surface area of prisms and cylinders • Arc length and sector areas ***<u>Possible Extension:</u>*** • *Solve problems involving surface areas and volumes of spheres and cones* • *Similar shapes* Students should be able to: • Use and understand ratio notation • Simplify ratios, including in the form 1:n and n:1 • Sharing into a ratio, and solve problems involving ratio • Understand and apply sensible units of measurements in everyday settings. • Find percentages of amounts • Solve worded percentage problems, including percentage increase and decrease • Understand the multiplicative relationship between ratios • Write a ratio as a linear function • Express one number as a percentage of another • Solve harder worded problems, involving ratio, percentages and fractions • Compound units • Using multipliers for percentage increase and decrease	➢ Perimeter ➢ Area ➢ Volume ➢ Surface area ➢ Prism ➢ Compound shapes ➢ Circumference ➢ Diameter ➢ Radius ➢ Arc ➢ Tangent ➢ Chord ➢ Sector ➢ Segment ➢ Unit price		

	Equations and Formula	***Possible Extension:*** • *Solve problems when you're given 2 related ratios* • *Reverse percentages* • *Compound interest and depreciation* Students should be able to: • Collect like terms • Simplify products of algebraic terms and expand brackets • Use function machines to work out inputs and outputs • Form simple expressions and formulas from worded descriptions • Substitute positive numbers into formulas and expressions • Form and solve linear algebraic equations • Factorise expressions by taking out common factor(s). • Use and understand multiplication and division index laws • Substitute negative numbers into formulas • Change the subject of a formulae. • Solve quadratic equations by factorizing ***Possible Extension:*** • *Solve harder linear equations with fractions* • *Solve quadratic inequalities by factorising and sketching the graph*	➢ Expression ➢ Equation ➢ Variable ➢ Equation ➢ Identity ➢ Factorise ➢ Expand ➢ Solve ➢ Coefficient ➢ Like terms		
Autumn 2	Number	This half term, students will improve their skills with numbers. They will practice adding, subtracting, multiplying and dividing with whole numbers, decimals, and fractions. They will also learn how to round the numbers and check their answers. In geometry, students will learn about different types of angles and how to measure and calculate them. They will study angles in triangles, straight lines, and shapes. These skills help with real-life problem solving and link to other subjects like Science and Design Technology. Students should be able to: • Understand and use square and cube numbers, square and cube roots; recall the squares of 1 to 10 and cubes of 1-5 and 10.	➢ Root ➢ Reciprocal ➢ Prime ➢ Integer	Common topics test x 3	**Core resources:** Sparx

		• Use and understand the term reciprocal • Find the prime number decomposition of positive integers • Use the prime number decomposition it to find the HCF and LCM of two numbers using venn diagrams. • Convert between improper fractions and mixed numbers. • Simplify a fraction to its simplest form • Understand when two fractions are equivalent. • Convert between fractions, decimals and percentages without a calculator. • Order a mix of fractions, decimals and percentages. • Convert between ordinary numbers and numbers in standard form • Use inequality notation to show error intervals for rounded and truncated numbers • Understand recurring decimals and convert to a fraction • Use error intervals in the context of simple bounds questions ***<u>Possible Extension:</u>*** • *Convert recurring decimals to fractions to use in calculations*	➢ Simplify ➢ Inequality		Mathsgenie.co.uk Youtube **<u>Enrichment and extension resources:</u>** <u>www.examq.co.uk</u>
	Angles	Students should be able to: • Recall and use properties of angles at a point, angles on a straight line, perpendicular lines and vertically oppositive angles at a vertex. • Use angle properties of quadrilaterals and triangles, including different types of triangles, parallelogram, trapezium and kites • Classify quadrilaterals by their geometric properties. • Calculate and use the sums of the interior and exterior angles of polygons • Understand and apply angles facts in parallel lines - alternate, corresponding and co-interior angles • Solve problems using properties of angles, of parallel and intersecting lines, and of triangles and explain reasoning. • Use bearings to specify direction	➢ Parallel ➢ Perpendicular ➢ Polygon ➢ Quadrilateral ➢ Alternate ➢ Corresponding ➢ Co-interior ➢ Hypotenuse ➢ Adjacent		

	Calculations	• Understand, recall and use Pythagoras' theorem for finding the length of the hypotenuse and the shorter sides of a triangle • Use Pythagoras in the context of the coordinate grid. • Worded Pythagoras • Trigonometry – SOHCAHTOA. Finding the length of missing sides and angles in right angled triangles. • Exact trigonometric values • Question involving Pythagoras' Theorem and trigonometry **<u>Possible Extension:</u>** • *3D Pythagoras and trigonometry* Students should be able to: • Know the times tables up to 10 by 10 and derive associated division facts. • Use a written method to multiply 2-digit by 3-digit numbers eg. 14 x 425 • Use a method to multiply 2-digit by 3-digit decimal numbers eg. 1.3 x 25.8 • Solve problems involving multiplication and division of integers without a calculator. • Be able to divide integers and decimals by an integer, and get a decimal answer • Solve problems involving multiplication and division of decimals without the use of a calculator. • Add and subtract multiply and divide positive and negative integers • Use negative numbers to solve real life problems • Multiply and divide fractions, including improper fractions • Divide a value by a decimal e.g. 54 ÷ 0.15 • Use index laws with numerical expressions involving multiplication and division • Use fractional, negative and zero powers in simplifying numerical expressions	➢ Integer ➢ Index / Indices ➢ Improper fractions ➢ Numerator ➢ Denominator		

		• Standard form calculations • Simplifying surds ***Possible Extension:*** • *Fractional, negative and zero powers* • *Exponential growth and decay problems*			

Spring 1	Equations and Formula	Students should be able to: • Collecting like terms. • In context, use formulae expressed in words or symbols; substitute positive numbers into the formula to find the value of the subject. • Represent inequalities on a number line. • Use inequality notation to specific simple error intervals due truncation or rounding. • Form and solve linear equations including those with unknowns on both sides. • Form and solve linear equations including those with fractions. • Expand and simplify the product of two linear expressions such as (x+2)(x+5) • Solve quadratic equations by completing the square. • Solve quadratic equations by using the quadratic formula. **Possible Extensions** - Find inverse and composite functions	➢ Expression ➢ Formula ➢ Substitution ➢ Inequalities ➢ Bounds ➢ Truncation ➢ Rounding ➢ Equations ➢ Fraction ➢ Simplify ➢ Linear ➢ Expand ➢ Quadratic		Core Resources: Sparxmaths Corbett Maths
	Transformations	Students should be able to: • Understand and use positive integer scale factors for enlargements on a grid without a specific centre of enlargement. • Be able to describe enlargements in a full sentence • Understand that rotations are specified by a centre and an angle. • Recognise, visualise and construct enlargements of objects using positive integer scale factors from a centre of enlargement.	➢ Enlargement ➢ Rotate ➢ Visualise ➢ Centre ➢ Draw ➢ Mirror ➢ Angle		

		• Identify the centre and the scale factor of enlargement • Be able to apply more than 1 reflection on a shape • Recognise, visualise and construct enlargements of objects using fractional scale factors. • Identify translations and use vector notation to describe movement in a full sentence. • Be able to identify and describe rotations in a full sentence • Be able to draw mirror lines e.g. y = 4 and x = - 2 and y = x • Be able to reflect 2D shapes using linear equations to describe the mirror line • Recognise, visualise and construct enlargements of objects using fractional scale factors; identify the centre and the scale factor of enlargement • Transform 2D shapes by combinations of transformations • Understand and use vector notation; calculate and represent graphically the sum of two vectors, the difference of two vectors and a scalar multiple of a vectors; calculate the resultant of two vectors; understand and use the commutative and associative properties of vector addition. • Recognise, visualise and construct enlargements of objects using negative scale factors **<u>Possible Extensions</u>** - Understand and apply a negative scale factor on a 2D shape - Describe the changes and invariance achieved by combinations of rotations, reflections and translations	➢ Perimeter ➢ Reflect ➢ Scale Factor ➢ 2d shape ➢ Vector ➢ Equations ➢ Congruent ➢ Transformatio ➢ Classifying ➢ Summarise ➢ Statistical		
Spring 2	Data	Students should be able to: • Recognise different types of data; discrete and continuous, quantitative and qualtiative, primary and secondary. • Use Venn diagrams to record their sorting and classifying of information. • Calculate the statistical measures mode, median, mean and range for discrete data and summarise	➢ Qualitative ➢ Classifying ➢ Measures ➢ Discrete ➢ Data ➢ Continous ➢ Quantitative ➢ Primary		

		using full sentences in contexts • Interpret the statistical measures mode, median, mean and range for discrete date by comparing distributions. • Recognise misleading diagrams and explain the errors. • Construct and interpret frequency polygons. • Draw and interpret scatter graphs for discrete and continuous variables, including using lines of best fit; understand the vocabulary of correlation, including positive, negative and zero correlation. • Collect and record discrete data using stem and leaf diagrams. • Be able to identify the biggest and smallest numbers, the mode and median from a stem and leaf diagram • Read and interpret data presented in two way tables. • Recognise different correlations of scatter graphs and be able to draw ana accurate line of best fit • Construct and interpret pie charts • Understand why pie charts cannot always be used for comparison and be able to articulate this in contexts • Draw box plots for discrete data and use box plots to compare distributions. • Compare two or more distributions using the measures of average and range. • Use the Peterson capture-recapture method to estimate population sizes. • Estimate the mean of a set of grouped data and determine the modal class, selecting the statistic most appropriate for the line of enquiry. • Select a representative sample from a population using random and stratified sampling; criticise a range of sampling methods. **<u>Possible Extensions</u>** - Draw and interpret cumulative frequency tables and diagrams and box plots for grouped data - Draw and interpret histograms for grouped data	➢ Secondary ➢ Two-way table ➢ Venn diagram ➢ Construct ➢ Frequency polygon ➢ Scatter graph ➢ Variable ➢ Line of best fits ➢ Correlation ➢ Averages ➢ Distribution ➢ Stem and Leaf diagrams ➢ Box plots ➢ Sampling method ➢ Pie Chart		
	Proportion and Percentages	Students should be able to: • Make sensible estimates of a range of measures in			

		everyday settings. • Find a percentage of an amount with a calculator • Answer worded problems involving percentages with a calculator • Solve percentage problems involving finding the percentage increase or decrease • To be able to write the method for compound interest questions involving appreciation • Use compound interest for depreciating amounts • Solve ratio problems where you are required to share a total. • Solve ratio problems where you are given one value. • Express ratios in the form 1: n or n:1 • Use and interpret maps and scale drawings. • Solve percentage problems involving finding the percentage increase or decrease • Solve ratio problems where you are given the difference between two values. • Calculate best buy. • Calculate an unknown quantity from quantities that vary in direct proportion using the unitary method. Including currency conversions and recipes. • Calculate missing lengths in similar shapes. • Solve percentage problems involving finding a % of something, % increase / decrease, expressing one number as a percentage of another. • Solve problems involving repeated proportional or percentage changes, including compound interest. • Represent repeated proportional change using a multiplier raised to a power. • Calculate the original amount when given the transformed amount after a percentage change. **<u>Possible Extensions</u>** - Write and use direct proportion equations	➢ Proportion ➢ Percentages ➢ Estimation ➢ Compound interest ➢ Ratio ➢ Depreciating amounts ➢ Quantity ➢ Conversion		