

SJBC Curriculum Termly Plan: Y7 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 simple linear function using a table of values e.g. $yy = 2xx$, $yy = xx + 3$ <u>Possible Extension:</u> <i>Plot graphs of linear function using a table of values e.g. $yy = 2xx + 1$, $yy = 3xx - 1$</i> <i>Using conversion graphs</i>	➤ Quadrant ➤ Coordinates ➤ Linear ➤ Gradient ➤ Y-intercept ➤ Linear graph ➤ Parallel	End of topic test on the following topics: - Algebra and Geometry - Ratio and proportion and Algebra 2	Core Resources: Sparxmaths Corbett Maths
	Measurements and shape geometry	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.	➤ Perimeter ➤ Area ➤ Volume ➤ Surface area ➤ Prism ➤ Compound shapes ➤ Circumference ➤ Diameter		

	Number	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. • 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. <u>Possible Extension:</u> ○ <i>Solving real world problems that involve finding both a percentage and a fraction of an amount to solve</i>	➤ Root ➤ Reciprocal ➤ Prime ➤ Integer ➤ Simplify ➤ Inequality	End of topic tests on the following topics: • Number 1 • Geometry and Number 2	Core Resources: Sparxmaths Corbett Maths
	Angles	Students should be able to: • Recall and use properties of angles at a point, angles on a straight line, perpendicular lines and vertically opposite 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	➤ Parallel ➤ Perpendicular ➤ Polygon ➤ Quadrilateral ➤ Alternate ➤ Corresponding ➤ Co-interior ➤ Hypotenuse ➤ Adjacent		

	Calculations - 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. Possible Extension: <i>Use bearings to specify direction</i> <i>Understand and use Pythagoras' theorem for finding the length of the hypotenuse and the shorter sides of a triangle</i> 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 Possible Extension: <i>Multiply and divide fractions, including improper fractions</i>	➤ Integer ➤ Index / Indices ➤ Improper fractions ➤ Numerator ➤ Denominator		
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		○ <i>Recognise, visualise and construct enlargements of objects using positive integer scale factors from a centre of enlargement</i> ○ <i>Identify the centre and the scale factor of enlargement and consider the implications of enlargement for perimeter</i> ○ <i>Be able to draw mirror lines e.g. $y = 4$ and $x = -2$ and $y = x$</i> ○ <i>Be able to reflect 2D shapes using linear equations to describe the mirror line</i> ○ <i>Recognise, visualise and construct enlargements of objects using fractional scale factors; identify the centre and the scale factor of enlargement and understand the implications of enlargement for perimeter</i>			
Spring 2	Data	This half term, students will develop their understanding of data by recognising the differences between discrete and continuous data, as well as between quantitative, qualitative, primary and secondary sources. They will learn to use Venn diagrams to organise and classify information clearly. Students will calculate key statistical measures, including mode, median, mean and range, and describe their findings using full sentences in real-life contexts. They will also compare distributions to interpret what these measures show. Students will collect and present discrete data using stem and leaf diagrams, using these to identify the smallest and largest values, along with the mode and median. In addition, they will read and interpret information in two-way tables, and explore scatter graphs by recognising different types of correlation and drawing an accurate line of best fit. Students should be able to: • Recognise different types of data; discrete and continuous, quantitative and qualitative, 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 using full sentences in contexts • Interpret the statistical measures mode, median, mean and range for discrete data by comparing distributions	➤ Discrete Data ➤ Continuous Data ➤ Qualitative ➤ Quantitative ➤ Primary ➤ Secondary ➤ Inequality ➤ Mean ➤ Median ➤ Mode	Feedback Test on: • Data • Proportion and Percentages	Core Resources: Sparxmaths Corbett Maths

	Proportion and Percentages	- 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 an accurate line of best fit Possible Extension: - Recognise misleading diagrams and explain the errors - Construct and interpret frequency polygons - Construct and interpret pie charts - Understand why pie charts cannot always be used for comparison and be able to articulate this in contexts 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 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 Possible Extension: - 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 problems	➤ Range ➤ Venn Diagram ➤ Stem and Leaf Diagram ➤ Two-Way Table ➤ Scatter Graphs ➤ Line of Best Fit ➤ Percentage ➤ Ratio ➤ Proportion ➤ Scale ➤ Interpret		
Term	Topic(s) and links to other subjects	Core Knowledge	Core Vocabulary	Assessment	Resources
		This half term, students will build key skills across graphs, sequences, angles, probability, and equations. They will learn to plot and interpret simple graphs, recognise patterns in sequences, and use angle facts to solve problems. Students will also explore basic probability and work with equations and formulae through substitution. These foundations support			

Summer 1	Graphs and Sequences Angles	learning across subjects where interpreting data and applying logical reasoning are essential. Students should be able to: - Express the term-to-term rule and find missing values in a range of sequences; including Fibonacci, simple quadratic and simple geometric sequences - Continue and explain the pattern for a range of sequences, including triangular, square and Fibonacci - Write an expression to describe the nth term of an arithmetic sequence - Prove, using the nth term, if a sequence is in a pattern - Plot graphs of linear functions for simple straight line graphs, for example, $y = 4$, $x = 3$ and $y = x + 2$ - Plot graphs of linear functions in which y is given explicitly in terms of x - Understand that $y = mx + c$ represents a straight line, interpret the values of m and c - Rearrange simple equations of linear graphs to identify the gradient - Find the gradient of straight lines having been given the graph <u>Possible Extension:</u> - Generate sequences from practical contexts - Solve quadratic equations by drawing a graph and cubic equations graphically when the graph is given - Find the exact solution of two simultaneous equations in two unknowns by interpreting the equations as lines and their common solution as the point of intersection Students should be able to: - Calculate and use the sums of the interior and exterior angles of quadrilaterals, pentagons and	- Sequence - Term - Term-to-term rule - Pattern - Linear Sequence nth Term - Coordinate - Axis / Axes - Origin - Quadrant - Plot - Substitute - X-axis - Y-axis - Straight line - Gradient - Intercept	Feedback Tests on: - Graphs and Sequences - Angles - Probability - Equations and Formula	Core Resources: Sparxmaths Corbett Maths 1st Class Maths Maths Genie Dr Austin
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	Probability	hexagons - Solve problems using properties of angles, justifying inferences and explaining reasoning with diagrams and text (excluding parallel lines) - Use bearings to specify direction - Specifically teach bearings with regard to positions between 2 points e.g. boat and lighthouse <u>Possible Extension:</u> - Know and use the exact values of $\sin$, $\cos$ and $\tan$ at key angles (0, 30, 45, 60, 90 degrees) to solve problems Students should be able to: - Use two-tables to organise information and to solve problems, including probability related - Complete frequency trees from information given - Use set notation to describe regions in venn diagrams, intersection, union, complement, empty set and universal set - Recognise $P(A)$, $P(A \cap B)$ and $P(A \cup B)$ <u>Possible Extension:</u> - Fill in missing probabilities from a tree diagrams for two independent events - Use tree diagrams to represent outcome of two or more events and to calculate probabilities of combinations of independent events Students should be able to: - Solve linear equations including one step, two step, and those with unknowns on both sides and fractions - Form and solve linear equations including unknowns on both sides and fractions for area and perimeter - Manipulate algebraic expressions by	- Angle - Interior - Exterior - Sum - Bearing - Calculate		
	Equations and Formula		- Set - Element - Universal set - Empty set - Venn diagram - Intersection ($\cap$) - Union ($\cup$) - Complement (A') - Subset - Overlap $P(A)$,		

		multiplying a single letter terms over a bracket $a(2a + 5)$ and collecting like terms when appropriate <u>Possible Extension:</u> ○ Multiply expressions of the form $(2x + 3)(3x - 7)$ and simplify the resulting expression ○ Use algebraic notation as the length of rectangles and use them to find areas of the rectangles ○ Solve quadratic equations of the form $x^2 \pm \dots$ by factorisation, including the difference of two squares	$P(B)$ • $P(A \cap B)$ • $P(A \cup B)$ • Linear • Variable • Expressions • Equations • Collect • Like Terms • Area • Perimeter • Manipulate		
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		○ <i>Construct equilateral triangles and hexagons</i>	or • Angle Bisector • Perpe ndicular Bisector • Comp ass • Equila teral • Interp ret • SAS • SAS • SSS • Congr uence
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Curriculum Termly Plan: Y8 Maths

Term	Topic(s) and links to other subjects	Core Knowledge	Core Vocabulary	Assessment	Resources
Autumn 1	Algebra 1 - Graphs	Students should be able to: - Plot and Identify coordinates in all four quadrants of the coordinate grid. - Identify geometrical information about coordinates eg. Midpoint of a line - Plot horizontal and vertical lines eg. $y=3$, $x=-2$ - Plot graphs of linear function using a table of values eg. $y=2x$, $y=x-1$, $y=3x-1$ Possible Extension: - Draw and interpret speed, distance time graphs and other real life graphs. - Understand and use the equation $y=mx+c$, and understand properties of parallel lines and their gradients - Solve simultaneous equations graphically.	- Quadrant - Coordinates - Linear graph - Parallel	Class test on the following topics combined. - Algebra and Geometry - Ratio and proportion and Algebra 2	Core Resources: Sparxmaths Corbett Maths
	Geometry - Measure	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. Possible Extension: - Find the area and circumference of a circle, semi and quarter circles, and compound shapes involving circles	- Perimeter - Area - Volume - Prism - Compound shapes - Circumference - Diameter - Radius - Arc - Tangent - Chord - Sector - Segment		
	Ratio and Proportion				

	Algebra 2 - Manipulation, equations and formulae	○ <i>Find the volume of cylinders</i> 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 <u>Possible Extension:</u> ○ <i>Understand the multiplicative relationship between ratios</i> ○ <i>Write a ratio as a linear function</i> ○ <i>Express one number as a percentage of another</i> ○ <i>Solve harder worded problems, involving ratio, percentages and fractions</i> 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). <u>Possible Extension:</u> ○ <i>Use and understand multiplication and division index laws</i> ○ <i>Substitute negative numbers into formulas</i> ○ <i>Change the subject of a formulae.</i>	• Expression • Equation • Identity • Factorise • Expand • Solve • Coefficient • Like terms		
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	Number 2 - Arithmetic and Calculations	of parallel and intersecting lines, and of triangles and explain reasoning. • Use bearings to specify direction • 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. Possible Extension: ○ Worded Pythagoras ○ <i>Trigonometry – SOHCAHTOA. Finding the length of missing sides and angles in right angled triangles.</i> 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 Possible Extension: ○ <i>Divide a value by a decimal e.g. $54 \div 0.15$</i> ○ <i>Use index laws with numerical expressions involving multiplication and division</i> ○ <i>Use fractional, negative and zero powers in simplifying numerical expressions</i>	• Integer • Index / Indices		
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Spring 1	Equations and formula 2	Students should be able to: • Manipulate algebraic expression by collecting like terms. • 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 specify 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. Possible Extension • Expand and simplify the product of two linear expressions such as $(x+2)(x+5)$	• Like terms • Coefficient • Substitute • Inequalities • Equation • Expand • Simplify	Class test topics on the following topics • Substitution • Solving equations	Core resources Corbett Maths Sparx Maths
	Transformations 1	Students should be able to: ○ Understand and use positive integer scale factors for enlargements on a grid without a specific centre of enlargement. ○ Describe enlargements in a full sentence ○ Understand that rotations are specified by a centre and an angle. ○ Rotate shapes using right angles and simple fractions of a turn ○ Rotate shapes using right angles and simple fractions of a turn ○ Recognise, visualise and construct enlargements of objects using positive integer scale factors from a centre of enlargement. ○ Identify the centre and the scale factor of enlargement and consider the implications of enlargement for perimeter.	• Transformation • Enlargement • Reduction • Scale factor • Rotation • Clockwise • Counter-clockwise • Image • Object • Center • Reflection	Class test topics on the following topics ○ Enlargement ○ Rotation	Core resources Corbett Maths Sparx Maths Mathgenie

		Possible Extension ○ Be able to apply more than 1 reflection on a shape			
	Transformations 2	Students should be able to: ○ Identify translations and use vector notation to describe movement in a full sentence. ○ 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; Possible Extension ○ Transform 2D shapes by combinations of rotations, reflections and translations using vectors; recognise and visualise rotations, reflections and translations including reflection symmetry of 3D shapes; understand the properties preserved by these transformations; understand the congruence in the context of transformations.	• Translation • Vector • Rotation • Clockwise • Counter-clockwise • Object • Image • Reflection • Mirror line • X-axis/ $y = 0$ • Y-axis/ $x = 0$	Class test topics on ○ Reflection ○ Translation	Core resources ○ CorbettMaths ○ Sparx Maths ○ Mathgenie
Spring 2	Data 1	Students should be able to: ○ Recognise different types of data; discrete and continuous, quantitative and qualitative, primary and secondary. ○ Use Venn diagrams to record their sorting and classifying of information.	• Venn Diagram • Mode • Median • Mean • Range • Construct	Class test topics on ○ Averages ○ Frequency polygons	Core resources ○ CorbettMaths ○ Sparx Maths ○ Mathgenie

		○ Calculate the statistical measures mode, median, mean and range for discrete data and summarise using full sentences in contexts ○ Interpret the statistical measures mode, median, mean and range for discrete data by comparing distributions. ○ Recognise misleading diagrams and explain the errors. ○ Construct and interpret frequency polygons. Possible Extension ○ 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.	• Frequency Polygon		
	Data 2	Students should be able to ○ 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 an 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 Possible Extension ○ Draw box plots for discrete data and	• Stem • Leaf • Key • Correlation • Positive • Negative • Line of best fit • Interpolation • Extrapolation • Pie chart • Angle of sector	Class test topics on	Core resources
				○ Stem and leaf plot ○ Scatter graphs ○ Pie chart	- CorbettMaths - Sparx Maths - Mathgenie

	Angles	• Write an expression to describe the nth term for arithmetic sequences. Use this expression to find terms in the sequence and evaluate if a number is in the sequence. • Generate sequences from practical contexts • Plot graphs of linear functions for simple straight line graphs, for example, $y = 4$, $x = 3$ and $y = x + 2$. • Plot graphs of linear functions in which y is given explicitly in terms of x • Understand that $y = mx + c$ represents a straight line, interpret the values of m and c. • Rearrange simple equations of linear graphs to identify the gradient • Find the gradient of straight lines having been given the graph. Possible extensions: • Solve quadratic equations by drawing a graph and cubic equations graphically when the graph is given. • Find the exact solution of two simultaneous equations in two unknowns by interpreting the equations as lines and their common solution as the point of intersection. • Use quadratic and cubic graphs to find solutions to equations, including simultaneous equations. • Write an expression to describe the nth term for quadratic equations.	• Sequence • Term • nth term • Arithmetic sequence • Common difference • Quadratic sequence • Geometric sequence • Axis • x-axis • y-axis • Gradient • y-intercept • Coefficient • Solution • Root • Intersection	Class test topics on: N'th term Generating sequences (all types) Simple straight-line graphs $Y=mx+c$ plot and construct table of values	First class maths Maths genie
		Students should be able to: • Understand and use the formula $(n-2) \times 180$ to find the sum of angles in polygons and the size of missing angles • Understand that exterior angles in polygons	• Polygon • Interior angle • Exterior angle • Bearing • Direction • Pythagoras' theorem • Hypotenuse • Trigonometry		Core Resources: Sparxmaths Corbett Maths First class maths Maths genie Core Resources: Sparxmaths

		sum to 360°, use this to find missing exterior angles. - Use bearings to specify direction and solve worded or visual problems. - Know and use the exact values of sin, cos and tan at 0°, 30°, 45°, 60° and 90°. <u>Possible extension</u> - Understand, recall and apply Pythagoras theorem to find missing lengths in right angled triangles - Understand, recall and apply trigonometric relationships to find missing lengths and angles in right angled triangles	Sine, Cosine, Tangent (sin, cos, tan)		Corbett Maths First class maths Maths genie
	Probability	Students should be able to: - Use two tables to organize information and to solve problems, including probability. - Complete frequency trees from information given - Use set notation to describe regions in venn diagrams, intersection, union, complement, empty set and universal set. - Pupils to recognise $P(A)$, $P(A \cap B)$ and $P(A \cup B)$ - To be able to fill in missing probabilities from a tree diagrams for two independent events - Use tree digrams to represent outcome of two or more events and to calculate probabilities of combinations of independent events. <u>Possible extension</u> - To be able to fill in missing probabilities from a tree diagram where selected items are not replaced.	- Intersection - Union - Complement - Empty set - Universal set - Probability - Outcome - Two-way table - Set notation - Probability		Core Resources: Sparxmaths Corbett Maths First class maths Maths genie
	Equations and Formula	Use tree diagrams to represent outcomes of two or more events and to calculate	- Equation - Variable - Linear - Quadratic		

	Construction	curve. • Use standard index form expressed in conventional notations; convert between ordinary and standard index form representations • Know that measurements using real numbers depend on the choice of unit; recognise that a measurement given to the nearest whole unit may be inaccurate by up to one half in either direction. • Use inequality notation to specify simple error intervals. • Use in the context of simple upper and lower bound worded questions • Perform standard form calculations (especially multiplication and division) <u>Possible extension</u> • Convert any recurring decimal to fraction algebraically • Use the correct notation to describe angles, such as BAC. • Construct an angle bisector • Construct a perpendicular bisector of a line segment • Construct triangles using a ruler and protractor only given information about their sides and angles; use a straight edge and compass to construct triangles with given sides including equilateral triangles. • Construct 30, 45, 60 degree angles. • Construct equilateral triangles and hexagons.			
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		<u>Possible extension</u> • Use constructions in real life contexts to solve loci problems			
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SJBC Curriculum Termly Plan: Y9 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 eg. Midpoint of a line - Plot horizontal and vertical lines eg. $yy = 3$, $xx = -2$ - Plot graphs of linear function using a table of values eg. $yy = 2xx$, $yy = xx - 1$, $yy = 3xx - 1$ - Draw and interpret speed, distance time graphs and other real life graphs. - Solve simultaneous equations graphically. <u>Possible Extension:</u> - Understand and use the equation $yy = mmxx + cc$, and understand properties of parallel lines and their gradients - Identify key points on graphs - Sketch graphs based on their equations	➤ Quadrant ➤ Coordinates ➤ Linear ➤ Gradient ➤ Y-intercept ➤ Linear graph ➤ Parallel	End of topic test on the following topics: - Algebra and Geometry - Ratio and proportion and Algebra 2	Core Resources: Sparxmaths Corbett Maths

	Measurements and shape geometry	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 <u>Possible Extension:</u> • <i>Surface area of prisms and cylinders</i> • <i>Arc length and sector areas</i>	➤ Perimeter ➤ Area ➤ Volume ➤ Surface area ➤ Prism ➤ Compound shapes ➤ Circumference ➤ Diameter ➤ Radius ➤ Arc ➤ Tangent ➤ Chord ➤ Sector ➤ Segment ➤ Unit price		
	Ratios and percentages	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 <u>Possible Extension:</u> • <i>Compound units</i> • <i>Using multipliers for percentage increase and decrease</i>			

	Equations and Formula	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. <u>Possible Extension:</u> • <i>Solve quadratic equations by factorizing</i> • <i>Solve quadratic inequalities by factorising and sketching the graph</i>	➤ 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. • 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.	➤ Root ➤ Reciprocal ➤ Prime ➤ Integer ➤ Simplify ➤ Inequality	End of topic tests on the following topics: • Number 1 • Geometry and Number 2	Core Resources: Sparxmaths Corbett Maths

	Angles	• 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 <u>Possible Extension:</u> • <i>Understand recurring decimals and convert to a fraction</i> • <i>Use error intervals in the context of simple bounds questions</i> Students should be able to: • Recall and use properties of angles at a point, angles on a straight line, perpendicular lines and vertically opposite 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 • 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.	➤ Parallel ➤ Perpendicular ➤ Polygon ➤ Quadrilateral ➤ Alternate ➤ Corresponding ➤ Co-interior ➤ Hypotenuse ➤ Adjacent		
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	Calculations	Possible Extension: • <i>Exact trigonometric values</i> • <i>Question involving Pythagoras' Theorem and trigonometry</i> 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. 14×425 • Use a method to multiply 2-digit by 3-digit decimal numbers eg. 1.3×25.8 • 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. $54 \div 0.15$ • Use index laws with numerical expressions involving multiplication and division • Use fractional, negative and zero powers in simplifying numerical expressions Possible Extension: • <i>Standard form calculations</i> • <i>Simplifying surds</i>	➤ Integer ➤ Index / Indices ➤ Improper fractions ➤ Numerator ➤ Denominator		
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Spring 1	Equations and Formula	Students should be able to: • Manipulate algebraic expression by 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.	➤ Expression ➤ Formula ➤ Substitution ➤ Inequalities ➤ Bounds ➤ Truncation ➤ Rounding		Core Resources: Sparxmaths Corbett Maths
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		= 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 and understand the implications of enlargement for perimeter. • Transform 2D shapes by combinations of rotations, reflections and translations using vectors; recognise and visualise rotations, reflections and translations including reflection symmetry of 3D shapes; understand the properties preserved by these transformations; understand the congruence in the context 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. <u>Possible Extensions</u> • Transform triangles and other 2D shapes by combinations of rotation, reflections and translations using vectors; recognise and visualises rotations, reflections and translations including reflection symmetry of 3D shapes. • Understand the properties preserved by these transformations; understand congruence in the context of transformations • Recognise, visualise and construct enlargements of objects using negative scale factors; identify the centre and the scale factor or enlargement and understand the implications of enlargement for perimeter.			
Spring 2	Data	Students should be able to: • Recognise different types of data; discrete and continuous, quantitative and qualitative, primary and secondary. • Use Venn diagrams to record their sorting and classifying of information.	➤ Qualitative ➤ Classifying ➤ Measures ➤ Discrete ➤ Data ➤ Continuous		

		• Calculate the statistical measures mode, median, mean and range for discrete data and summarise using full sentences in contexts • Interpret the statistical measures mode, median, mean and range for discrete data 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. • Know that correlations does not necessarily indicate causation and the difference between interpolation and extrapolation, and the dangers of extrapolations. • 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 an 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. <u>Possible Extensions</u> • Compare two or more distributions and make inferences, using the shape of the distributions. • 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.	➤ Quantitative ➤ Primary ➤ 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		
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	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. Possible Extensions • Write and use direct proportion equations • Write and use inverse proportion equations • 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.	➤ Proportion ➤ Percentages ➤ Estimation ➤ Compound interest ➤ Ratio ➤ Depreciating amounts ➤ Quantity ➤ Conversion		
Term	Topic(s) and links to	Core Knowledge	Core Vocabulary	Assessment	Resources

	other subjects				
Summer 1	Graphs and Sequences Angles	Students should be able to: - Describe the term-to-term rule for a range of numerical sequences, continue a numerical sequence and find missing terms. - Write an expression to describe the nth term for arithmetic sequences. Use this expression to find terms in the sequence and evaluate if a number is in the sequence. - Generate sequences from practical contexts - Write an expression to describe quadratic and geometric sequences. - Plot graphs of linear functions - Understand that equations for straight lines can be written in the form $y = m x + c$. Identify the values for the gradient and y-intercept from $y = m x + c$. - Use quadratic and cubic graphs to find solutions to equations, including simultaneous equations. - Write an expression to describe the nth term for quadratic equations. Students should be able to: - Understand and use the formula $(n-2) \times 180$ to find the sum of angles in polygons and the size of missing angles - Understand that exterior angles in polygons sum to 360°, use this to find missing exterior angles. - Use bearings to specify direction and solve worded or visual problems. - Know and use the exact values of $\sin$, $\cos$ and $\tan$ at 0°, 30°, 45°, 60° and 90°. - Understand, recall and apply Pythagoras theorem to find missing lengths in right angled triangles - Understand, recall and apply trigonometric	- Sequence - Term nth term - Arithmetic sequence - Common difference - Quadratic sequence - Geometric sequence - Axis x-axis y-axis - Gradient y-intercept - Coefficient - Solution - Root - Intersection - Polygon - Interior angle - Exterior		Core Resources: Sparxmaths Corbett Maths First class maths Maths genie

		relationships to find missing lengths and angles in right angled triangles			
	Probability	<u>Possible Extensions</u> - Understand, recall and apply Pythagoras theorem in 3D contexts. Students should be able to: - Use two-way tables and frequency trees to sort information, solve problems and find probabilities - Use set notation to describe regions in Venn diagrams. Understand and recognise $P(A \cup B)$, $P(A)$ and $P(B)$ - Use tree diagrams to sort information, solve problems and find probabilities	- or angle - Bearing - Direction - Pythagoras' theorem - Hypotenuse - Trigonometry - Sine, Cosine, Tangent (sin, cos, tan)		
	Equations and formula	<u>Possible Extensions</u> - Use the product rule for counting Students should be able to: - Solve one and two-step equations, including those with unknowns on both sides and fractions, - Form and solve linear equations applied to shape problems, e.g finding the missing side given the area - Expand single and double brackets and simplify the products. Apply expanding brackets to solve problems involving expressing the area of a rectangle or triangle. - Solve quadratic expressions by factorising into double brackets and by using the difference of two squares - Solve quadratic inequalities using algebraic methods and sketching the curve	- Intersection - Union - Complement - Empty set - Universal set - Probability - Outcome - Two-		

		Possible Extensions • Solve quadratic equations by completing the square • Solve quadratic equations by using the quadratic formula	way table • Set notation • Probability • Equation • Variable • Linear • Quadratic • Expanded • Factorise • Inequality • Solution		
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Summer 2	Number	Students should be able to: • Recognise standard form expressed in conventional notations. Convert between standard form and ordinary form. • Perform calculations with standard form, especially involving multiplication and division. • Know that real measurements given to the nearest whole may be inaccurate by up to one half in either direction. Apply this reasoning to specify simple error intervals and solve upper and lower bounds problems • Convert any recurring decimal to a fraction algebraically Possible Extensions • Find the upper and lower bounds of complex calculations	• Standard form • Power of ten • Ordinary number • Rounding • Error interval • Recurring decimal		
	Construction	Students should be able to: • Use the correct notation to identify angles • Construct an angle bisector using a ruler and compass • Construct a perpendicular bisector of a straight line using a ruler and compass • Construct triangles (including equilateral triangles) using a ruler, protractor and compass • Construct 30-, 45- and 60-degree angles using a ruler and compass • Construct regular hexagons using a ruler and compass • Apply constructions to real life contexts and solve problems involving loci Possible Extensions • Use a ruler and compass to produce standard constructions involving midpoint of a line or the perpendicular of a point to a line	• Angle • Compass • Ruler • Protractor • Angle bisector • Perpendicular bisector • Loci		