

	<p>Ratios and percentages</p> <p>Equations and Formula</p>	<p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> • Find the area of a circle, and recall the different parts of a circle. • Find the volume of 3D shapes and L-shaped prisms. <p>Students should be able to:</p> <ul style="list-style-type: none"> • 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 <p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> ○ Solve reverse percentage problems <p>Students should be able to:</p> <ul style="list-style-type: none"> • 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 equations <p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> • Factorise expressions by taking out common factor(s). 	<ul style="list-style-type: none"> ➤ Radius ➤ Arc ➤ Tangent ➤ Chord ➤ Sector ➤ Segment ➤ Unit price <ul style="list-style-type: none"> ➤ Expression ➤ Equation ➤ Variable ➤ Equation ➤ Identity ➤ Factorise ➤ Expand ➤ Solve ➤ Coefficient ➤ Like terms 		
Autumn 2		This half term, students will improve their skills with numbers. They will practice adding, subtracting, multiplying and dividing with whole			

	<p>Number</p>	<p>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.</p> <p>Students should be able to:</p> <ul style="list-style-type: none"> • 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. <p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> ○ <i>Solving real world problems that involve finding both a percentage and a fraction of an amount to solve</i> 	<ul style="list-style-type: none"> ➤ Root ➤ Reciprocal ➤ Prime ➤ Integer ➤ Simplify ➤ Inequality 	<p>End of topic tests on the following topics:</p> <ul style="list-style-type: none"> • Number 1 • Geometry and Number 2 	<p>Core Resources: Sparxmaths Corbett Maths</p>
	<p>Angles</p>	<p>Students should be able to:</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> ➤ Parallel ➤ Perpendicular ➤ Polygon ➤ Quadrilateral ➤ Alternate ➤ Corresponding ➤ Co-interior ➤ Hypotenuse ➤ Adjacent 		

	Calculations	<ul style="list-style-type: none"> • 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. <p>Possible Extension:</p> <ul style="list-style-type: none"> • <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> <p>Students should be able to:</p> <ul style="list-style-type: none"> • 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 <p>Possible Extension:</p> <ul style="list-style-type: none"> • <i>Multiply and divide fractions, including improper fractions</i> 	<ul style="list-style-type: none"> ➤ Integer ➤ Index / Indices ➤ Improper fractions ➤ Numerator ➤ Denominator 		
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		<ul style="list-style-type: none"> ○ <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	<p>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.</p> <p>Students should be able to:</p> <ul style="list-style-type: none"> ● 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 	<ul style="list-style-type: none"> ➤ Discrete Data ➤ Continuous Data ➤ Qualitative ➤ Quantitative ➤ Primary ➤ Secondary ➤ Inequality ➤ Mean ➤ Median ➤ Mode 	<p>Feedback Test on:</p> <ul style="list-style-type: none"> ● Data ● Proportion and Percentages 	<p>Core Resources:</p> <p>Sparxmaths</p> <p>Corbett Maths</p>

	<p>Proportion and Percentages</p>	<ul style="list-style-type: none"> • 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 <p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> ○ <i>Recognise misleading diagrams and explain the errors</i> ○ <i>Construct and interpret frequency polygons</i> ○ <i>Construct and interpret pie charts</i> ○ <i>Understand why pie charts cannot always be used for comparison and be able to articulate this in contexts</i> <p>Students should be able to:</p> <ul style="list-style-type: none"> • 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 <p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> ○ Solve percentage problems involving finding the percentage increase or decrease ○ <i>Solve ratio problems where you are given the difference between two values</i> ○ <i>Calculate best buy problems</i> 	<ul style="list-style-type: none"> ➤ Range ➤ Venn Diagram ➤ Stem and Leaf Diagram ➤ Two-Way Table ➤ Scatter Graphs ➤ Line of Best Fit <ul style="list-style-type: none"> ➤ Percentage ➤ Ratio ➤ Proportion ➤ Scale ➤ Interpret 		
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	<p>Ratios and percentages</p>	<ul style="list-style-type: none"> • Find the area of a circle, and recall the different parts of a circle. • Find the volume of 3D shapes and L-shaped prisms. <p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> ○ Find the area and circumference of a circle, semi and quarter circles, and compound shapes involving circles ○ Find the volume of cylinders <p>Students should be able to:</p> <ul style="list-style-type: none"> • 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 • <p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> ○ 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 	<ul style="list-style-type: none"> ➤ Circumference ➤ Diameter ➤ Radius ➤ Arc ➤ Tangent ➤ Chord ➤ Sector ➤ Segment ➤ Unit price 		
	<p>Equations and Formula</p>	<p>Students should be able to:</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> ➤ Expression ➤ Equation ➤ Variable ➤ Equation ➤ Identity ➤ Factorise ➤ Expand ➤ Solve ➤ Coefficient 		

		<ul style="list-style-type: none"> Factorise expressions by taking out common factor(s). <p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> Use and understand multiplication and division index laws Substitute negative numbers into formulas Change the subject of a formulae. 	<ul style="list-style-type: none"> Like terms 		
Autumn 2	Number	<p>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.</p> <p>Students should be able to:</p> <ul style="list-style-type: none"> 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. <p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> Convert between ordinary numbers and numbers in standard form Use inequality notation to show error intervals for rounded and truncated numbers Understand recurring decimals 	<ul style="list-style-type: none"> Root Reciprocal Prime Integer Simplify Inequality 	<p>End of topic tests on the following topics:</p> <ul style="list-style-type: none"> Number 1 Geometry and Number 2 	<p>Core Resources: Sparxmaths Corbett Maths</p>

	Angles	<p>Students should be able to:</p> <ul style="list-style-type: none"> • 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. • <p>Possible Extension:</p> <ul style="list-style-type: none"> ○ Worded Pythagoras ○ <i>Trigonometry – SOHCAHTOA. Finding the length of missing sides and angles in right angled triangles.</i> 	<ul style="list-style-type: none"> ➤ Parallel ➤ Perpendicular ➤ Polygon ➤ Quadrilateral ➤ Alternate ➤ Corresponding ➤ Co-interior ➤ Hypotenuse ➤ Adjacent 		
	Calculations	<p>Students should be able to:</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> ➤ Integer ➤ Index / Indices ➤ Improper fractions ➤ Numerator ➤ Denominator 		

		<ul style="list-style-type: none">• 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• <p><u>Possible Extension:</u></p> <ul style="list-style-type: none">○ <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>			
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	Algebra 2 - Manipulation, equations and formulae	<ul style="list-style-type: none"> ○ <i>Express one number as a percentage of another</i> ○ <i>Solve harder worded problems, involving ratio, percentages and fractions</i> <p>Students should be able to:</p> <ul style="list-style-type: none"> ● 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). <p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> ○ <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> 	<ul style="list-style-type: none"> ➤ Expression ➤ Equation ➤ Identity ➤ Factorise ➤ Expand ➤ Solve ➤ Coefficient ➤ Like terms 		
Autumn 2	Number 1 -	<p>Students should be able to:</p> <ul style="list-style-type: none"> ● 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. <p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> ○ <i>Convert between ordinary numbers and numbers in standard form</i> 	<ul style="list-style-type: none"> ➤ Root ➤ Reciprocal ➤ Prime ➤ Integer ➤ Simplify ➤ Inequality 	<p>Class test on the following topics:</p> <ul style="list-style-type: none"> ● Number 1 ● Geometry and Number 2 	<p>Core Resources: Sparxmaths Corbett Maths</p>

	<p>Geometry - Angles, Parallel lines, Bearings and Pythagoras</p>	<ul style="list-style-type: none"> ○ <i>Use inequality notation to show error intervals for rounded and truncated numbers</i> ○ <i>Understand recurring decimals</i> <p>Students should be able to:</p> <ul style="list-style-type: none"> ● 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. <p>Possible Extension:</p> <ul style="list-style-type: none"> ○ <i>Worded Pythagoras</i> ○ <i>Trigonometry – SOHCAHTOA. Finding the length of missing sides and angles in right angled triangles.</i> 	<ul style="list-style-type: none"> ➤ Parallel ➤ Perpendicular ➤ Polygon ➤ Quadrilateral ➤ Alternate ➤ Corresponding ➤ Co-interior ➤ Hypotenuse ➤ Adjacent 		
	<p>Number 2 - Arithmetic and Calculations</p>	<p>Students should be able to:</p> <ul style="list-style-type: none"> ● 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 	<ul style="list-style-type: none"> ➤ Integer ➤ Index / Indices 		

		<ul style="list-style-type: none"> 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 <p>Possible Extension:</p> <ul style="list-style-type: none"> 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 			
Spring 1	Equations and formula 2	<p>Students should be able to:</p> <ul style="list-style-type: none"> 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. <p>Possible Extension</p> <ul style="list-style-type: none"> Expand and simplify the product of two linear expressions such as $(x+2)(x+5)$ 	<ul style="list-style-type: none"> Like terms Coefficient Substitute Inequalities Equation Expand Simplify 	<p>Class test topics on the following topics</p> <ul style="list-style-type: none"> Substitution Solving equations 	<p>Core resources</p> <p>Corbett Maths</p> <p>Sparx Maths</p>
	Transformations 1	<p>Students should be able to:</p> <ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Transformation Enlargement Reduction Scale factor Rotation Clockwise Counter-clockwise Image Object Center 	<p>Class test topics on the following topics</p> <ul style="list-style-type: none"> Enlargement Rotation 	<p>Core resources</p> <p>CorbettMaths</p> <p>Sparx Maths</p> <p>Mathgenie</p>

		<ul style="list-style-type: none"> ○ 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. <p><u>Possible Extension</u></p> <ul style="list-style-type: none"> ○ Be able to apply more than 1 reflection on a shape 	➤ Reflection		
	Transformations 2	<p>Students should be able to:</p> <ul style="list-style-type: none"> ○ 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; <p><u>Possible Extension</u></p> <ul style="list-style-type: none"> ○ 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. 	<ul style="list-style-type: none"> ➤ Translation ➤ Vector ➤ Rotation ➤ Clockwise ➤ Counter-clockwise ➤ Object ➤ Image ➤ Reflection ➤ Mirror line ➤ X-axis/ $y = 0$ ➤ Y-axis/ $x = 0$ 	<p>Class test topics on</p> <ul style="list-style-type: none"> ○ Reflection ○ Translation 	<p>Core resources</p> <p>CorbettMaths</p> <p>Sparx Maths</p> <p>Mathgenie</p>
Spring 2	Data 1	<p>Students should be able to:</p> <ul style="list-style-type: none"> ○ Recognise different types of data; discrete and 	<ul style="list-style-type: none"> ➤ Venn Diagram ➤ Mode 	<p>Class test topics on</p> <ul style="list-style-type: none"> ○ Averages 	<p>Core resources</p> <p>CorbettMaths</p>

		<p>continuous, quantitative and qualitative, primary and secondary.</p> <ul style="list-style-type: none"> ○ 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. ○ Recognise misleading diagrams and explain the errors. ○ Construct and interpret frequency polygons. <p><u>Possible Extension</u></p> <ul style="list-style-type: none"> ○ 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. 	<ul style="list-style-type: none"> ➤ Median ➤ Mean ➤ Range ➤ Construct ➤ Frequency Polygon 	<ul style="list-style-type: none"> ○ Frequency polygons 	Sparx Maths Mathgenie
	Data 2	<p>Students should be able to</p> <ul style="list-style-type: none"> ○ 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 <p><u>Possible Extension</u></p> <ul style="list-style-type: none"> ○ Draw box plots for discrete data and use box 	<ul style="list-style-type: none"> ➤ Stem ➤ Leaf ➤ Key ➤ Correlation ➤ Positive ➤ Negative ➤ Line of best fit ➤ Interpolation ➤ Extrapolation ➤ Pie chart ➤ Angle of sector 	<p>Class test topics on</p> <ul style="list-style-type: none"> ○ Stem and leaf plot ○ Scatter graphs ○ Pie chart 	Core resources CorbettMaths Sparx Maths Mathgenie

		plots to compare distributions.			
	Proportion and Percentages 1	<p>Students should be able to:</p> <ul style="list-style-type: none"> ○ 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 <p>Possible Extension</p> <ul style="list-style-type: none"> ○ To be able to write the method for compound interest questions involving appreciation 	<ul style="list-style-type: none"> ➤ Multiplier ➤ Find ➤ Increase ➤ Decrease ➤ Percentages ➤ 	<p>Class test topics on</p> <ul style="list-style-type: none"> ○ Percentages ○ Increasing and decreasing percentages 	<p>Core resources</p> <p>CorbettMaths</p> <p>Sparx Maths</p> <p>Mathgenie</p>
	Proportion and Percentages 2	<p>Students should be able to:</p> <ul style="list-style-type: none"> ○ 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 ratio problems where you are given the difference between two values. ○ Calculate best buy. <p>Possible Extension</p> <ul style="list-style-type: none"> ○ Calculate an unknown quantity from quantities that vary in direct proportion using the unitary method. Including currency conversions and recipes. 	<ul style="list-style-type: none"> ➤ Share ➤ Divide ➤ Scale factor ➤ Actual distance ➤ Map distance ➤ Cheaper ➤ More expensive 	<p>Class test topics on</p> <ul style="list-style-type: none"> ○ Diving ratio ○ Scale drawing ○ Best buy 	<p>Core resources</p> <p>CorbettMaths</p> <p>Sparx Maths</p> <p>Mathgenie</p>

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	<p>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.</p> <p>Students should be able to:</p> <ul style="list-style-type: none"> • 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. <p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> • <i>Understand and use the equation $yy = mmxx + cc$, and understand properties of parallel lines and their gradients</i> • <i>Identify key points on graphs</i> • <i>Sketch graphs based on their equations</i> 	<ul style="list-style-type: none"> ➤ Quadrant ➤ Coordinates ➤ Linear ➤ Gradient ➤ Y-intercept ➤ Linear graph ➤ Parallel 	<p>End of topic test on the following topics:</p> <ul style="list-style-type: none"> • Algebra and Geometry • Ratio and proportion and Algebra 2 	<p>Core Resources: Sparxmaths Corbett Maths</p>

	<p>Measurements and shape geometry</p>	<p>Students should be able to:</p> <ul style="list-style-type: none"> • 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 <p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> • <i>Surface area of prisms and cylinders</i> • <i>Arc length and sector areas</i> <p>Students should be able to:</p> <ul style="list-style-type: none"> • 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 <p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> • <i>Compound units</i> • <i>Using multipliers for percentage increase and decrease</i> 	<ul style="list-style-type: none"> ➤ Perimeter ➤ Area ➤ Volume ➤ Surface area ➤ Prism ➤ Compound shapes ➤ Circumference ➤ Diameter ➤ Radius ➤ Arc ➤ Tangent ➤ Chord ➤ Sector ➤ Segment ➤ Unit price 		
	<p>Ratios and percentages</p>				

	Equations and Formula	<p>Students should be able to:</p> <ul style="list-style-type: none"> • 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. <p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> • <i>Solve quadratic equations by factorizing</i> • <i>Solve quadratic inequalities by factorising and sketching the graph</i> 	<ul style="list-style-type: none"> ➤ Expression ➤ Equation ➤ Variable ➤ Equation ➤ Identity ➤ Factorise ➤ Expand ➤ Solve ➤ Coefficient ➤ Like terms 		
Autumn 2	Number	<p>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.</p> <p>Students should be able to:</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> ➤ Root ➤ Reciprocal ➤ Prime ➤ Integer ➤ Simplify ➤ Inequality 	<p>End of topic tests on the following topics:</p> <ul style="list-style-type: none"> • Number 1 • Geometry and Number 2 	<p>Core Resources: Sparxmaths Corbett Maths</p>

	Angles	<ul style="list-style-type: none"> • 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 <p><u>Possible Extension:</u></p> <ul style="list-style-type: none"> • <i>Understand recurring decimals and convert to a fraction</i> • <i>Use error intervals in the context of simple bounds questions</i> <p>Students should be able to:</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> ➤ Parallel ➤ Perpendicular ➤ Polygon ➤ Quadrilateral ➤ Alternate ➤ Corresponding ➤ Co-interior ➤ Hypotenuse ➤ Adjacent 		
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	Calculations	<p>Possible Extension:</p> <ul style="list-style-type: none"> • <i>Exact trigonometric values</i> • <i>Question involving Pythagoras' Theorem and trigonometry</i> <p>Students should be able to:</p> <ul style="list-style-type: none"> • 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 <p>Possible Extension:</p> <ul style="list-style-type: none"> • <i>Standard form calculations</i> • <i>Simplifying surds</i> 	<ul style="list-style-type: none"> ➤ Integer ➤ Index / Indices ➤ Improper fractions ➤ Numerator ➤ Denominator 		
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Spring 1	Equations and Formula	<p>Students should be able to:</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> ➤ Expression ➤ Formula ➤ Substitution ➤ Inequalities ➤ Bounds ➤ Truncation ➤ Rounding 		Core Resources: Sparxmaths Corbett Maths
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	<p>Transformations</p>	<ul style="list-style-type: none"> • 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 $(x+2)(x+5)$ <p>Possible Extensions</p> <ul style="list-style-type: none"> • Solve quadratic equations by completing the square. • Solve quadratic equations by using the quadratic formula. <p>Students should be able to:</p> <ul style="list-style-type: none"> • 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. • 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. • Be able to apply more than 1 reflection on a shape • Recognise, visualise and construct enlargements of objects using fractional scale factors. • Understand and use positive integer scale factors for enlargements on a grid without a specified centre of enlargement. • 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 	<ul style="list-style-type: none"> ➤ Equations ➤ Fraction ➤ Simplify ➤ Linear ➤ Expand ➤ Quadratic <ul style="list-style-type: none"> ➤ Enlargement ➤ Rotate ➤ Visualise ➤ Centre ➤ Draw ➤ Mirror ➤ Angle ➤ Perimeter ➤ Reflect ➤ Scale Factor ➤ 2d shape ➤ Vector ➤ Equations ➤ Congruent ➤ Transformation ➤ Classifying ➤ Summarise ➤ Statistical 		
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		<p>= x</p> <ul style="list-style-type: none"> • 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. <p>Possible Extensions</p> <ul style="list-style-type: none"> • 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	<p>Students should be able to:</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> ➤ Qualitative ➤ Classifying ➤ Measures ➤ Discrete ➤ Data ➤ Continuous 		

		<ul style="list-style-type: none"> • 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. <p><u>Possible Extensions</u></p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> ➤ 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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	<p>Proportion and Percentages</p>	<p>Students should be able to:</p> <ul style="list-style-type: none"> • 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. <p><u>Possible Extensions</u></p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> ➤ Proportion ➤ Percentages ➤ Estimation ➤ Compound interest ➤ Ratio ➤ Depreciating amounts ➤ Quantity ➤ Conversion 		
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