

5-YEAR CURRICULUM PLAN



Curriculum at a Glance

Year 7	Year 8	Year 9	Year 10	Year 11
<ul style="list-style-type: none">• Number- The Four Rules, Place Value, Converting Fractions• Algebra - Sequences, understanding notation.• Shape and Space - Area of shapes, Geometric Reasoning, Construction.• Data - Probability, Statistical Diagrams.	<ul style="list-style-type: none">• Number - Direct proportion, multiplication and division of fractions, indices, percentages• Algebra - Manipulation, solving equations, solving inequalities• Shape and Space - Area of circles, angles in parallel lines• Data - Probability, Interpret statistical diagrams	<ul style="list-style-type: none">• Number - Standard form, approximation and estimation.• Algebra - Expressions, brackets and graphs• Shape and Space- Transformations, angles in polygons, Pythagoras• Data - MMR	<ul style="list-style-type: none">• Number- Indices, - Direct and Inverse proportion, - Standard Form, - Compound Units, - Bounds• Algebra - Expanding and Factorising, - Rearranging Formulae, - Inequalities• Shape and Space - Angles, - Similar shapes, -Volume and Surface Area, Trigonometry, - Construction• Data - Probability, - Representing data, - Graphs	<ul style="list-style-type: none">• Number- Vectors• Algebra - Algebraic fractions & proof, -Trig graph & transformations, - Simultaneous equations, - Function and proof• Shape and Space - Circle theorems, - Congruence, - Angles recap & bearings•



3/5YR Curriculum Plan (Current Yr7-9)

Focus / Term	Half Term One	Half Term Two	Half Term Three	Half Term Four	Half Term Five	Half Term Six
Year 7 Topic Covered and End Points	<u>Probability</u> Know and use the vocabulary of probability Generate sample spaces for single events Calculate the probability of a single event Understand and use the probability scale Know that the sum of probabilities for all possible outcomes is 1 Solve problems involving two-way tables Find probabilities from two-way tables <u>Addition and Subtraction</u> Properties of addition and subtraction Mental strategies for addition and subtraction Use formal methods for addition of integers *discuss inverse operation	<u>Place Value</u> Recognise the place value of any number in an integer up to one billion Understand and write integers up to one billion in words and figures Work out intervals on a number line Position integers on a number line Compare two numbers using =, ≠, <, >, ≤, ≥ Order a list of integers Understand place value for decimals Position decimals on a number line Compare and order any number up to one billion Round integers to the nearest power of ten Round to 1 sig fig. 1 dp etc <u>Multiplication & Division</u>	<u>Area</u> Solve problems using the area and perimeter of rectangles and parallelograms Compound shapes area and perimeter Solve problems using the area of triangles Solve problems using the area of trapezia (H) <u>Converting & ordering FDP</u> Represent any fraction as a diagram. Represent % on 100 squares Represent fractions on number lines Represent fractions and equivalent decimals on a number line Convert between fractions and decimals fluently Convert fluently between simple fractions, decimals and percentages, including with a calculator	<u>Shape Properties</u> 3 letter notations Understand and use letter and labelling conventions including those for geometric figures Understand angles as a measure of turn Classify angles Recognise types of triangles - including rotational symmetry Understand and use the criteria to which triangles are congruent Recognise types of quadrilaterals - including rotational symmetry Identify polygons up to a decagon - including rotational symmetry <u>Directed Number</u> Understand and use representations of directed numbers Order directed numbers using lines	<u>Construction</u> Draw and measure line segments including geometric figures. Measure angles up to 180°. Draw angles up to 180°. Draw and measure angles between 180° and 360°. Include Scale and notation Construct triangles using SSS. Construct triangles using SSS, SAS and ASA. Prove by measuring if a trapezium and triangle is isosceles Know notation for parallel, perpendicular and equal length. Angle notation Identify acute, obtuse and reflex angles <u>Add and Subtract Fractions</u> <i>Understand representations of fractions</i>	<u>Geometric Reasoning</u> Understand and use the sum of angles at a point. Understand and use the sum of angles on a straight line. Understand and use the equality of vertically opposite angles. Know, derive and apply the sum of angles in a triangle. Know and apply the sum of angles in a quadrilateral. Solve angle problems using properties of triangles and quadrilaterals. Solve complex angle problems. <u>Statistical diagrams</u> Use and interpret pie charts. Solve problems with frequency trees. Solve problems with bar charts and line charts.

	<p>Use formal methods for addition of decimals Use formal methods for subtraction of integers Use formal methods for subtraction of decimals Choose the most appropriate method: mental strategies, formal written or calculator. Solving problems involving money calculations Solving problems with perimeter Sequences Describe and continue sequences Predict and check next term(s) Linear and non-linear (Geometric) sequences Continue linear sequences Continue non-linear sequences Explain the term-to-term rule Find missing terms (H)</p>	<p>Properties of multiplication & division Understand and use factors HCF Understand and use multiples LCM Use formal methods to multiply integers * Discuss inverse Use formal methods to multiply decimals Use formal methods to divide integers Use formal methods to divide decimals Multiplying & dividing by powers of 10 Converting between metric units Working with powers (squares and cubes & roots) Calc & non-calc Understand and use order of operations</p>	<p>Compare and order fractions, decimals and percentages Explore fractions above one, decimals and percentages (H) Understanding Algebraic notation Given a numerical input, find the output of a single function machine Use inverse operations to find the input given the output Find numerical inputs and outputs for a series of two function machines Use diagrams and letters to generalise number operations Use diagrams and letters with single function machines Find the function machine given a simple expression Use diagrams and letters with a series of two function machines Find the function machines given a two-step expression Substituting into expressions</p>	<p>and appropriate symbols = < > etc Perform calculations that cross zero Add directed numbers Subtract directed numbers Multiplication of directed numbers Multiplication and division of directed numbers Order of operations with directed numbers Substitution with directed numbers Fractions & Percentages of Amounts Find a fraction of a given amount. Find the original amount. Express one number as a fraction of another. Find a percentage of a given amount (non-calculator).</p>	<p><i>Understand and use equivalent fractions</i> <i>Convert between mixed numbers and improper fractions</i> <i>Add and subtract fractions from an integer, with the same denominator, with different denominators</i> <i>Use equivalence to add and subtract decimals and fractions</i> Prime and Proof Use concept and find and use Factors and multiples, Recognise and identify prime numbers Identify factors of numbers and expressions, product of the primes, including product notation Recognise square and triangular numbers Find common factors of a set of numbers including the HCF, including algebra. Find common multiples of a set of numbers including the LCM</p>	<p>Construct pie charts. Interpret and draw pictograms.</p>
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					Use Venn diagram to Find HCF and LCM	
NC	Data, Algebra, Number	Number.	Shape and Space, Number, Algebra	Shape and Space, Number,	Shape and Space, Number, Algebra	Shape and Space, Data
Powerful Knowledge and Careers	Probability language Add Fibonacci					
Tier 3 Words	PROBABILITY OUTCOME CERTAIN LIKELY IMPOSSIBLE	APPROXIMATE INTEGER INTERVAL MEDIAN NEGATIVE PLACE PLACE VALUE RANGE	Polygon Triangle Quadrilateral Fraction Decimal Percentage Function Input Output	Scalene Isosceles Right angled Subtract Negative Product Equivalent Whole	NUMERATOR DENOMINATOR Multiples Factors Primes	Vertically Opposite Interior Exterior
Long Term Retrieval	Students will complete an assessment in first lesson which will inform retrieval	Probability Add subtract Sequences	Probability Add subtract Sequences Place Value Multiply Divide	Probability Sequences Place Value 4 Rules (+ - x ÷) Area FDP Algebraic Notation	Probability Sequences Place Value 4 Rules (+ - x ÷) including directed number Area FDP Algebraic Notation Shape properties Fractions of amounts	Probability Sequences Place Value 4 Rules (+ - x ÷) with directed number Area FDP Algebraic Notation Shape properties Fractions of amounts Add subtract fractions Prime and Proof
Assessment Details	Probability and add and subtract fractions with common denominator. End Point – Probability, Add and subtract fractions and Sequences.	– Place value. End Point – Place value, multiplication, and division.	– Area and Converting FDP. End Point – Area, Converting FDP and algebraic notation.	– Shape properties, add subtract directed numbers. End Point – Shape properties, directed numbers, fractions of amounts.	– Construction, add and subtract fractions with common denominator. End Point – Construction, add and subtract	– Geometric reasoning End Point – Geometric reasoning and Statistical diagrams.

					fractions, prime and proof.	
Misconceptions	<p>Probability it will rain is always 50/50 as it will either rain or it will not.</p> <p>Add/Sub Incorrect setting out of formal method where decimal points are not aligned</p> <p>Sequences "The 4th term will be double the 2nd term. 100th is ten times the tenth, etc.</p>	<p>Place Value A number with more digits is greater than one with less. E.g., 9.999999999 9 is greater than 10.</p> <p>Multiplication and Division Multiplication/Division by 10 can be done by 'taking off a zero'</p>	<p>Area Once students know to divide by two for triangles, they will divide by two for rectangles</p> <p>FDP Unclear on the denominator meaning how many equal parts.</p> <p>Algebraic Notation A = 1, b = 2 or other 'codebreaker' ideas.</p>	<p>Directed number Students may confuse positive and negative and counters; may add only negative or positive counters instead of zero pairs or make mistakes with signs when performing operations, e.g., $-1 \times -3 = -3$.</p> <p>Fractions of amounts Because dividing by 10 gives you 10% dividing by 5 will give you 5% and dividing by 20 gives 20% etc You cannot increase by over 100% because 100% is everything.</p>	<p>Construction Measure lines from 1cm. Incorrectly measure angles from outer value on protractor always.</p> <p>Add and Sub fractions Ensure students know denominator is total number of parts.</p> <p>Prime and Proof LCM as HCF and vice versa.</p>	<p>Geometric reasoning Any angles on a straight line are included in angle sum to 180^0.</p> <p>Statistical diagrams. When comparing two pie charts just considering fraction covered rather than total data</p>
Homework	<ul style="list-style-type: none"> • Probability • Add and Subtract • Sequences 	<ul style="list-style-type: none"> • HT1 Review • Place Value • Multiply and Divide 	<ul style="list-style-type: none"> • Term 1 Review • Convert FDP • Algebraic notation 	<ul style="list-style-type: none"> • HT3 Review • Shape properties • Directed number 	<ul style="list-style-type: none"> • Term 2 Review • Construction • Add and Sub fractions 	<ul style="list-style-type: none"> • HT5 Review • Geometric reasoning • Statistical diagrams
Year 8 Topic Covered and End Points	<p>Sets and Probability Identify and represent sets. Interpret and create Venn diagrams Know and use the vocabulary of probability</p>	<p>Ratio and Scale Understand the meaning and representation of ratio Understand and use ratio notation</p>	<p>Scatter Graphs and Frequency Table Draw and interpret scatter graphs Understand and describe linear correlation</p>	<p>Share in a Ratio Share an amount in a ratio Calculate different parts from a given value of one part</p>	<p>Angles in Parallel lines On a straight line, around a point, vertically opposite Understand and use basic angle rules and notation</p>	<p>Equations and Inequalities Solve linear equations Solve linear equations with the unknown on one side when calculating with negative numbers is required - R</p>

<p>Generate sample spaces for single events Calculate the probability of a single event Understand and use the probability scale Know that the sum of probabilities for all possible outcomes is 1 Experimental probability</p> <p><u>Algebraic Manipulation</u> Understand expression, equation inequality term Collect terms Brackets – expanding etc (area of rectangle) Form algebraic expressions incl perimeter Use directed number with algebra Multiply out a single bracket Expand multiple single brackets and simplify Multiply binomial</p> <p><u>Multiplicative Change</u> Solve problems involving direct proportion – including recipe problems Explore conversion graphs Convert between currencies</p>	<p>Solve problems involving ratios of the form 1 : n (or n : 1) Solve problems involving ratios of the form m : n Express ratios in their simplest integer form Express ratios in the form 1 : n (H) Compare ratios and fractions</p> <p><u>Cartesian Plane</u> Work with coordinates in all four quadrants Find the midpoint of a line (H) Identify and draw lines that are parallel to the axes Recognise and use the line $y=x$ Recognise and use lines of the form $y = kx$ Recognise and use lines of the form $y = x + a$ Link $y = kx$ to direct proportion problems Plot graphs of the form $y=mx+c$</p> <p><u>Solving Equations</u> Solve equations, including with brackets</p>	<p>Draw and use line of best fit Identify different types of data Read and interpret ungrouped frequency tables Represent grouped discrete data Read and interpret grouped frequency tables Represent continuous data grouped into equal classes</p> <p><u>Multiply and Divide Fractions</u> Represent multiplication of fractions Multiply a fraction by an integer Find the product of a pair of unit fractions Find the product of a pair of any fractions Divide an integer by a fraction Divide a fraction by a unit fraction Understand and use the reciprocal Divide any pair of fractions Understand and use the reciprocal</p>	<p>Calculate different parts from a given difference in amount</p> <p><u>Indices</u> Calculate numbers squared, cubed Calculate square, cubed and higher Estimate square root of non-square numbers Adding and subtracting expressions with indices Simplifying algebraic expressions by multiplying indices Simplifying algebraic expressions by dividing indices Using the addition law for indices Using the addition and subtraction law for indices Expand brackets that use laws of indices</p>	<p>Investigate angles between parallel lines and the transversal Identify and calculate with alternate and corresponding angles Identify and calculate with co-interior, alternate and corresponding angles Solve complex problems with parallel line angles</p> <p><u>Interpret Charts and Diagrams</u> Set up a statistical enquiry Design and criticise questionnaires Pie Charts Draw and interpret line graphs Choose the most appropriate diagram for given set of data Represent and interpret grouped quantitative data. Find and interpret the range. Compare distributions using charts. Identify misleading graphs. Compare distributions using charts</p>	<p>Solve linear equations with the unknown on both sides when the solution is a whole number - R Solve linear equations with the unknown on both sides when the solution is a fraction - E Solve linear equations with the unknown on both sides when the solution is a negative number - E Solve linear equations with the unknown on both sides when the equation involves brackets - E Represent linear inequalities on a number line Solve one sided linear inequalities Solve two sided linear inequalities</p> <p><u>Percentages</u> Identify the multiplier for a percentage increase or decrease Use calculators to increase an amount by a percentage greater than 100% Use calculators to decrease an amount by a percentage Solve problems involving percentage change Solve original value problems when</p>
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	<p>Inverse proportion</p> <p>Understand scale factors as multiplicative representations, could be ratio or fraction</p> <p>Draw and interpret scale diagrams</p>	<p>Form and solve equations with brackets</p> <p>Solve Equations with unknown on both sides</p> <p>With fractions</p>	<p>Divide any pair of fractions</p> <p>*Extend to mixed numbers</p> <p>Sequences</p> <p>Generate sequences given a rule in words</p> <p>Generate sequences given a simple algebraic rule</p> <p>Generate sequences given a complex algebraic rule</p> <p>Find and use Nth Term</p>		<p>Identify misleading graphs</p> <p>Convert Units</p> <p>Convert metric measures of lengths</p> <p>Convert metric units of mass and capacity</p> <p>Understand time</p>	<p>working with percentages</p> <p>Solve financial problems including simple interest</p> <p>Area, circles</p> <p>area of simple shapes (rectangle triangle and parallelogram)</p> <p>Calculate area of trapezium</p> <p>Label parts of a circle</p> <p>Calculate the circumference of a circle when radius or diameter is given</p> <p>Calculate the perimeter of composite shapes including sections of a circle</p> <p>Calculate the area of a circle when radius or diameter is given</p> <p>Calculate the area of composite shapes that include sections of a circle</p> <p>Calculate area of sectors (H)</p> <p>Calculate perimeter of sectors (H)</p>
NC	Data Algebra Number	Data Algebra Ratio	Data Algebra Number	Number Ratio	Data Number Geometry	Algebra Number Geometry
Tier 3 Vocab	OUTCOMES PROBABILITY SET	RATIO EQUAL PARTS PROPORTION	VARIABLE RELATIONSHIP CORRELATION	RATIO EQUAL PARTS PROPORTION	PARALLEL ANGLE TRANSVERSAL	LINEAR PARALLEL SOLVE

	SIMPLIFY SUBSTITUTE EQUIVALENT PROPORTION VARIABLE AXES	QUADRANT COORDINATE HORIZONTAL SIMPLIFY SUBSTITUTE EQUIVALENT	NUMERATOR DENOMINATOR WHOLE SEQUENCE TERM POSITION	BASE POWER EXPONENT	HYPOTHESIS SAMPLING PRIMARY DATA COMMUTATIVE ASSOCIATIVE DIVIDEND	MULTIPLIER PERCENTAGE AREA CIRCUMFERENCE TRAPEZIUM CHORD RADIUS DIAMETER
Long Term Retrieval	Year 7 Assessment	Sets and Probability, Algebraic Manipulation, Multiplicative Change.	Sets and Probability, Algebraic Manipulation, Multiplicative Change. Ratio and Scale, cartesian Plane, Solving Equations	Sets and Probability, Algebraic Manipulation, Multiplicative Change. Ratio and Scale, cartesian Plane, Solving Equations. Scatter Graphs and Frequency Table, Multiply and divide fractions, Sequences	Sets and Probability, Algebraic Manipulation, Multiplicative Change. Ratio and Scale, cartesian Plane, Solving Equations Scatter Graphs and Frequency Table, Multiply and divide fractions, Sequences Share in a Ratio, Indices	Sets and Probability, Algebraic Manipulation, Multiplicative Change. Ratio and Scale, cartesian Plane, Solving Equations Scatter Graphs and Frequency Table, Multiply and divide fractions, Sequences Share in a Ratio, Indices Angles in Parallel lines, Interpret Charts and Diagrams Convert units
Assessment details	– Sets and Probability, expand single brackets End Point – Sets and Probability, Algebraic Manipulation, Multiplicative Change	– Ratio and Scale, recognise the equation $y = x$ End Point – Ratio and Scale, cartesian Plane, Solving Equations	– Scatter Graphs and Frequency Table, multiply unit fractions End Point – Scatter Graphs and Frequency Table, Multiply and divide fractions, Sequences	– Share in a Ratio End Point –_Share in a Ratio, Indices	– Angles in Parallel lines,_Design and criticise questionnaires Draw and interpret line graphs End Point – Angles in Parallel lines, Interpret Charts and Diagrams Convert units	– Equations and Inequalities, identify the multiplier for a percentage increase or decrease End Point – Equations and Inequalities, Percentages, Area, circles

Misconceptions	<p>Sets and Probability equivalence can be revisited in the study of probability Understand that probability is number of desired outcomes / total possible outcomes and that this is the same as parts of a whole when using fractions.</p> <p>Algebraic Manipulation Students think $2a$ and a^2 are equal Students think $2a + 3b = 5ab$</p> <p>Multiplicative Change Pupils might use addition/subtraction instead of multiplication or division</p>	<p>Ratio and Scale Students might use addition and subtraction rather than multiplication and division</p> <p>Cartesian Plane Students plot points or write co-ordinates to understand why $y = a$ is parallel to the x axis</p> <p>Solving Equations Students struggle with the starting point when forming – they need to understand to start from the unknown (which can be any letter) and build up from there</p>	<p>Scatter Graphs and Frequency Table Students think that the line of best fit must go through all the points and through the origin.</p> <p>Multiply and Divide Fractions Students might think they need the reciprocal of both fractions in a divide question Students might think multiplying always makes the number larger</p> <p>Sequences Students think “the 4th term will be double the 2nd term. 100th is ten times the tenth etc...”</p>	<p>Share in a Ratio Some students believe ratios always compare a part to a whole, like fractions.</p> <p>Indices Students might think you multiply the indices when the base is being multiplied</p>	<p>Angles in Parallel lines Students might think that any angles on a straight line are included in angle sum to 180° so be sure to include angles on a straight line at different points to show variation</p> <p>Interpret Charts and Diagrams Students might think that the range is an average</p> <p>Convert Units Students will not always be clear when to multiply or divide</p>	<p>Equations and inequalities Some pupils may think that you always must manipulate the equation to have the unknowns on the LHS of the equal sign, for example $2x - 3 = 6x + 6$</p> <p>Percentages Some students may think the multiplier for, say, a 20% decrease is 0.2 rather than 0.8</p> <p>Area of Circles and Trapezium Some pupils may use the sloping height when finding cross-sectional areas that are parallelograms, triangles or trapezia</p>
Homework	• SPARX from HT2	• SPARX	• SPARX	• SPARX	• SPARX	• SPARX
Year 9 Topic Covered and End Points	<p>Indices and Standard form Identify types of numbers (factors, multiples and prime) Write a number as a product of its prime factors Use prime factorisations to find the HCF and LCM of two numbers</p>	<p>Sequences Find the nth term of an ascending linear sequence Find the nth term of a descending linear sequence Generate terms of a sequence from a position-to-term rule Use the nth term of a sequence to deduce if</p>	<p>Angles in Polygons Establish the fact that angles in a triangle must total 180° and 360 in a quadrilateral use the fact that the exterior angle of a triangle is equal to the sum of the two opposite interior angles</p>	<p>3D shapes Surface area of cubes and cuboids Find volume of cubes and cuboids Find volume of cylinder Find volume of prisms Surface area of cylinder Cones and spheres (H)</p> <p>Expressions and Brackets</p>	<p>Representing data Find the mean, median, mode and range of a set of data Find the range and modal class of set of grouped data and the class containing the median of a set of data Calculate an estimate of the mean from a frequency table</p>	<p>Graphs Know that graphs of functions of the form $y = mx + c$, $x \pm y = c$ and $ax \pm by = c$ are linear Plot graphs of functions of the form $y = mx \pm c$ Plot graphs of functions of the form $ax \pm by = c$</p>

<p>Solve problems using highest common factors or lowest common multiples <i>Multiply and divide using index laws. (number only)</i> <i>Fractional, negative index laws (number only)</i> Use standard form to write large numbers Use standard form to write small numbers Calculate with standard form Compare with standard form</p> <p><u>Transformations</u> Reflect and object in a mirror line Rotate an object around a point Translate an object Describe a rotation Describe a translation Describe a reflection Enlarge a shape with a positive and fractional scale factor Enlarge a shape with a positive scale factor from a centre Enlarge a shape with a fractional scale factor from a centre Enlarge a shape with a negative scale factor from a centre Describe an enlargement</p>	<p>a given number is in a sequence Recognise and use the Fibonacci sequences and geometric sequence Explore growing patterns and other problems involving quadratic sequences Find the next terms of a quadratic sequence using first and second differences Generate terms of a quadratic sequence from its nth term Find the nth term of a quadratic sequence</p> <p><u>Approximation and estimation</u></p> <p>Round numbers to a given number of significant figures, decimal places Estimate numerical calculations Determine whether calculation using rounding will give an underestimate or overestimate Find upper and lower bounds (and error intervals) for rounding and truncation using inequality notation</p>	<p>Deduce interior angles using sum of angles in a triangle Establish the size of an interior angle in a regular polygon Establish the size of an exterior angle in a regular polygon Solve missing angle problems in polygons Understand and use bearings</p> <p><u>Fractions</u> Convert between mixed and improper fractions Apply addition to proper fractions, improper fractions and mixed numbers Apply subtraction to proper fractions, improper fractions and mixed numbers Multiply a proper fraction by a proper fraction including negative Multiply mixed numbers including negative Divide a proper fraction by a whole number Divide mixed numbers Increase/decrease by a fraction of an amount</p>	<p>Manipulate expressions by multiplying a single term over a bracket (the distributive law) Expanding two single brackets Multiply two linear expressions of the form $(ax \pm b)(cx \pm d)$ Factorising into a single bracket Factorising quadratic $(x \pm b)(x \pm d)$ Substitute into a formula Change the subject of a formula when one step is required Change the subject of a formula when two steps are required Apply an understanding of inverse operation to a formula to make a specific variable the subject</p>	<p>Calculate an estimate of the mean from a grouped frequency table Construct and interpret graphs of time series Construct and interpret frequency polygons Construct and interpret stem and leaf diagrams Analyse and compare sets of data, appreciating the limitations of different statistics (mean, median, mode, range) Interpret a scatter diagram using understanding of correlation use the line of best fit to estimate values</p> <p><u>Trigonometry</u> Choose an appropriate trigonometric ratio that can be used in each situation Understand that sine, cosine and tangent are functions of an angle Use a calculator to find the sine, cosine and tangent of an angle Know the trigonometric ratios, $\sin\theta = \text{opp/hyp}$, $\cos\theta = \text{adj/hyp}$, $\tan\theta = \text{opp/adj}$ Set up and solve a trigonometric equation</p>	<p>Find the gradient of a straight line on a unit grid Find the y-intercept of a straight line Sketch linear graphs Distinguish between a linear and quadratic graph Plot graphs of quadratic functions of the form $y = x^2 \pm c$ Sketch a simple quadratic graph, use to estimate solutions for $x = 0$ $y = 0$ Plot and interpret graphs of piece-wise linear functions in real contexts</p> <p><u>Rates</u> Calculate Speed, distance and time using formula. Rearrange formula where appropriate. Plot and interpret distance-time graphs (speed-time graphs) Calculate Density, mass and volume using Formula. Rearrange formula where appropriate. Unit pricing (Best buy by comparison of 100g of similar products</p>
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	Combine transformations	Calculate with upper and lower bounds	Find a starting amount after an Increase/decrease by a fraction Pythagoras Know the meaning of a Pythagorean triple Know and use Pythagoras' theorem Calculate the hypotenuse of a right-angled triangle using Pythagoras' theorem in two dimensional figures Calculate one of the shorter sides in a right-angled triangle using Pythagoras' theorem in two dimensional figures Solve problems using Pythagoras' theorem in two dimensional figures		to find a missing side in a right-angled triangle Set up and solve a trigonometric equation when the unknown is in the denominator of a fraction Set up and solve a trigonometric equation to find a missing angle in a right-angled triangle Use trigonometry to solve problems Introduce similarity to solve problems including with Pythagoras	Construction Use ruler and compasses to construct the perpendicular bisector of a line segment Use ruler and compasses to bisect an angle Use a ruler and compasses to construct a perpendicular to a line from a point and at a point Understand a circle as the locus of a point equidistant from a fixed point Recognise the perpendicular distance is the shortest between two points Solve simple problems involving loci Combine techniques to solve more complex loci problems
NC	Number Geometry	Algebra Number Geometry	Number Geometry	Algebra Geometry	Data Geometry	Algebra Geometry
Powerful Knowledge and Careers						
Tier 3 Vocab	Factor Multiple Prime Translation Transformations Reflection	Linear sequence Quadratic Term Significant Figure Estimate	Improper fraction Mixed numbers Right angle Hypotenuse	Cube Cuboid Cylinder Substitute Formula Quadratic	Mean Median Mode Range Sine/Cosine/Tangent Opposite Adjacent	Bisect Parallel Perpendicular X – axis Y – axis Gradient Intercept

Long Term Retrieval	Year 8 Assessment	Indices and Standard form Transformations	Indices and Standard form Transformations Sequences Approximation and estimation	Indices and Standard form Transformations Sequences Approximation and estimation Angles in Polygons Fractions Pythagoras	Indices and Standard form Transformations Sequences Approximation and estimation Angles in Polygons Fractions Pythagoras 3D shapes Expressions and Brackets	Indices and Standard form Transformations Sequences Approximation and estimation Angles in Polygons Fractions Pythagoras 3D shapes Expressions and Brackets Representing data Trigonometry
Assessment Details	- – Indices End Point – Indices and Standard form Transformations	Sequences Approximation and estimation End Point – Sequences Approximation and estimation	Angles in Polygons Fractions End Point – Angles in Polygons Fractions Pythagoras	– 3D shapes End Point – 3D shapes Expressions and Brackets	– Representing data End Point – Representing data Trigonometry	– Graphs End Point – Graphs Construction
Misconceptions	<u>Standard Form</u> When converting between ordinary and standard form some pupils may incorrectly connect the power to the number of zeros; e.g. $4 \times 10^5 = 400\,000$ so $4.2 \times 10^5 = 4\,200\,000$ Similarly, when working with small numbers (negative powers of 10) some	<u>Sequences</u> Some pupils will think that the nth term of the sequence 2, 5, 8, 11, ... is $n + 3$. Some pupils may think that the (2n)th term is double the nth term of a linear sequence. Some pupils may think that sequences with nth term of the form 'ax ± b' must start with 'a'.	<u>Angles in Polygons</u> Some pupils may think that the sum of the interior angles of an n-sided polygon can be calculated using $\text{Sum} = n \times 180^\circ$. Some pupils may think that the sum of the exterior angles increases as the number of sides of the polygon increases. If the bearing of A from B	<u>3D shapes</u> Some students will work out $(\pi \times r)^2$ when finding the area of a circle Some students may use the sloping height when finding cross-sectional areas that are parallelograms, triangles or trapezia Some students may confuse the concepts	<u>Representing data</u> Some pupils may incorrectly estimate the mean by dividing the total by the numbers of groups rather than the total frequency. Some pupils may incorrectly think that there can only be one model class. Some pupils may incorrectly estimate	<u>Graphs</u> When plotting linear graphs some pupils may draw a line segment that stops at the two most extreme points plotted Students may think that a sketch is a very rough drawing. It should still identify key features. <u>Construction</u>

	<p>pupils may think that the power indicates how many zeros should be placed between the decimal point and the first non-zero digit</p> <p><u>Transformations</u></p> <p>When describing or carrying out a translation, some pupils may count the squares between the two shapes rather than the squares that describe the movement between the two shapes.</p> <p>When carrying out a reflection some pupils may think that the object and image should be an equal distance from the edge of the grid, rather than an equal distance from the mirror line.</p> <p>Some students will wrestle with the idea that a line $x = a$ is parallel to the y-axis</p> <p>Some students may think that the centre of rotation is always in the centre of the shape</p> <p>Some pupils may think that the centre of enlargement always</p>	<p><u>Approximation and estimation</u></p> <p>Students not rounding to 1SF when estimating</p> <p>Students struggling when dividing by 0.5</p> <p>Some pupils may think $35\ 934 = 36$ to two significant figures</p>	<p>is 'x', then some pupils may think that the bearing of B from A is '180 - x'.</p> <p><u>Fractions</u></p> <p>Some students may think that you simply can simply add/subtract the whole number part of mixed numbers and add/subtract the fractional part of mixed numbers when adding/subtracting mixed numbers, e.g. $3 - 2$</p> <p><u>Pythagoras</u></p> <p>Some students may use Pythagoras' theorem as though the missing side is always the hypotenuse</p>	<p>of surface area and volume</p> <p><u>Expressions and Brackets</u></p> <p>Some students may think that it is always true that $a=1, b=2, c=3$, etc.</p> <p>A common misconception is to believe that $a^2 = a \times 2 = a2$ or $2a$ (which it can do on rare occasions but is not the case in general)</p> <p>When working with an expression such as $5a$, some students may think that if $a=2$, then $5a = 52$. Some students may think that $3(g+4) = 3g+4$</p> <p>The convention of not writing a coefficient of 1 (i.e. '1x' is written as 'x' may cause some confusion. Some students may think that $5h - h = 5$</p>	<p>the range of grouped data by subtracting the upper bound of the first group from the lower bound of the last group.</p> <p>Some students may think that a line of best fit always must pass through the origin</p> <p><u>Trigonometry</u></p> <p>Some students may not appreciate the fact that adjacent and opposite labels are not fixed and are only relevant to a particular acute angle. In situations where both angles are given this can cause difficulties.</p> <p>Some students may not balance an equation such as $\sin 35 = 4/x$ correctly, believing that the next step is $(\sin 35)/4 = x$</p>	<p>When constructing the bisector of an angle some students may think that the intersecting arcs need to be drawn from the ends of the two lines that make the angle.</p> <p>When constructing a locus such as the set of points a fixed distance from the perimeter of a rectangle, some students may not interpret the corner as a point (which therefore requires an arc as part of the locus)</p>
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	must be (0,0), or that the centre of enlargement will be in the centre of the object shape.					
Homework	• SPARX	• SPARX	• SPARX	• SPARX	•	

Year 10-11

Focus / Term	Half Term One	Half Term Two	Half Term Three	Half Term Four	Half Term Five	Half Term Six
Year 10 HIGHER Topic Covered and End Points	Trigonometry Recap Pythagoras Choose an appropriate trigonometric ratio that can be used in each situation	Formula Solve two linear simultaneous equations in two variables in very simple cases (addition &	Graphs (H) Identify and interpret gradients of linear functions graphically Identify and interpret intercepts of linear functions algebraically	Direct & inverse Proportion Best Buy/ Exchange rates Know and recognise the difference between direct and inverse proportion	Inequalities Graphs (HIGHER) Construct and shade a graph to show a linear inequality of the form $y > ax + b$, $y < ax + b$, $y \geq ax + b$ or $y \leq ax + b$	Trigonometry + (H) Use Pythagoras' theorem in 3D. Use trigonometry in 3D. Solve bearings problems using trigonometry.

	<p>Understand that sine, cosine and tangent are functions of an angle Use a calculator to find the sine, cosine and tangent of an angle Know the trigonometric ratios, $\sin\theta = \text{opp/hyp}$, $\cos\theta = \text{adj/hyp}$, $\tan\theta = \text{opp/adj}$ Set up and solve a trigonometric equation to find a missing side in a right-angled triangle Set up and solve a trigonometric equation when the unknown is in the denominator of a fraction Set up and solve a trigonometric equation to find a missing angle in a right-angled triangle Use trigonometry to solve problems know the exact values of $\sin \vartheta$ and $\cos \vartheta$ for $\vartheta = 0^\circ, 30^\circ, 45^\circ, 60^\circ$ and 90°; know the exact value of $\tan \vartheta$ for $\vartheta = 0^\circ, 30^\circ, 45^\circ$ and 60° Indices Know and use the fact that $a^{-n} = 1/a^n$ Know and use the fact that $a^{1/n} = n\sqrt{a}$ Writing a number as a power of another Solving equations involving powers Probability</p>	<p>subtraction but no multiplication required) Solve two linear simultaneous equations in two variables in simple cases (multiplication of one equation only required) Solve two linear simultaneous equations in two variables in simple cases (multiplication of both equations required) Form & solve problems involving two simultaneous equations Change the subject of a formula when more than two steps are required Change the subject of a formula when the required subject appears twice (factorising) Converting recurring decimals to fractions using algebra Representing data Find the mean, median, mode and range of a set of data Find the range and modal class of set of grouped data and the class</p>	<p>Find the equation of a line through one point with a given gradient Find the equation of a line through two given points Identify & find the equation of parallel lines Identify & find the equation of perpendicular lines Plot graphs of linear and quadratic functions Plot graphs of cubic and reciprocal functions Use and interpret graphs of quadratic functions Interpret linear and non-linear real-life graphs. Use and interpret graphs of cubic, reciprocal & exponential functions Similar Shapes Identify similarity of shapes in a range of situations Finding missing lengths in similar shapes Solve problems with area/volume of similar shapes Convert between units of length, area & volume Quadratics Expand and factorise Double brackets RECAP Expanding triple brackets Solve a quadratic equation of the form $x^2 + bx + c = 0$ by factorising</p>	<p>Know the features of graphs that represent a direct or inverse proportion situation Solve problems involving direct proportion using the constant of proportionality $y=kx$ Solve problems involving inverse proportion using the constant of proportionality $y=k/x$ Solve multi-step problems involving direct & inverse proportion Density Area and Perimeter Area of compound shape Area of Circles and parts of Circles Area of Trapezia Perimeter of compound shapes Pythagoras for triangles and trapezia Circumference of circles Perimeter of semicircle and parts of circles Volume and Surface area Calculate volume and surface area of pyramids, cones and spheres Solve problems involving pyramids, cones and spheres Solving frustum questions using similar shapes</p>	<p>Construct and shade a graph to show a linear inequality in two variables stated implicitly Construct and shade a graph to represent a set of linear inequalities in two variables Find the set of integer coordinates that are solutions to a set of inequalities in two variables Surds Solve problems involving the simplification of surds Addition & subtraction of surds Multiply two binomials involving surds Rationalise the denominator of a surd expression Compound units Convert between compound units of density and pressure Solve problems involving density Solve problems involving pressure Solve more complex problems involving speed Solve compound interest problems Growth and Decay</p>	<p>Find the area of a triangle and a segment of a circle Use the sine rule to solve 2D problems. Use the cosine rule to solve 2D problems. Construction Use ruler and protractor to construct triangles, and other shapes, from written descriptions Use ruler and compasses to construct the perpendicular bisector of a line segment, bisect an angle, construct a perpendicular to a line from a point and at a point Solve simple problems involving loci Combine techniques to solve more complex loci problems Construct a shape from its plans and elevations Reflection, Rotation, Translation. Enlargement from a point, fractional and negative Bounds Know and understand limits of accuracy. Find Upper and Lower bounds Calculate with Upper and Lower bounds</p>
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	<p>outcomes of an event systematically</p> <p>Use frequency trees to record outcomes of probability experiments</p> <p>Use 2way tables to record outcomes of probability experiments</p> <p>List all elements in a combination of sets using a Venn diagram</p> <p>Use theoretical probability to calculate expected outcomes</p> <p>Use experimental probability to calculate expected outcomes</p> <p>Know and use the multiplication law of probability</p> <p>Now and use the addition law of probability</p> <p>Use a tree diagram to solve simple problems involving independent combined events</p> <p>Use a tree diagram to solve complex problems involving independent combined events</p> <p>Use a tree diagram to solve simple problems involving dependent combined events</p> <p>Use a tree diagram to solve complex problems involving dependent combined events</p>	<p>containing the median of a set of data</p> <p>Calculate the mean from a frequency table</p> <p>Calculate an estimate of the mean from a grouped frequency table</p> <p>Construct and interpret graphs of time series</p> <p>Construct and interpret frequency polygons</p> <p>Construct and interpret stem and leaf diagrams</p> <p>Analyse and compare sets of data, appreciating the limitations of different statistics (mean, median, mode, range)</p> <p>Interpret a scatter diagram using understanding of correlation use the line of best fit to estimate values</p> <p>Use the product rule for counting</p>	<p>Solve a quadratic equation by rearranging and factorising</p> <p>Find approximate solutions to quadratic equations using a graph (including higher question)</p> <p>Solve by formula</p> <p>Solve by completed square</p> <p>Difference of two squares</p> <p>Nth term of quadratics</p> <p>Solve problems using geometric sequences.</p> <p>Work out terms in Fibonacci-like sequences.</p>	<p>Solve surface/area volume questions involving similar shapes</p>		
NC	Data, Shape Number	Algebra. Data	Shape and Space, Algebra.	Number. Shape and Space,	Number. Algebra.	Number. Shape and Space,

Tier 3 Words	Function Sine Cosine Tangent Adjacent Outcome Event	Linear Equation Estimate Mean Frequency	Quadratic Similar Convert Area Volume	Area Volume Surface Area	Compound Density Surd Inequality Variable	Loci Perpendicular Parallel Segment Arc
Long Term Retrieval	Students will complete a benchmark assessment	Trigonometry Indices Probability	Trigonometry Indices Probability Formula Representing data	Trigonometry Indices Probability Formula Representing data Graphs Similar Shapes	Trigonometry Indices Probability Formula Representing data Graphs Similar Shapes Direct & inverse Proportion Volume and Surface area	Trigonometry Indices Probability Formula Representing data Graphs Similar Shapes Direct & inverse Proportion Volume and Surface area Inequalities (HIGHER Surds Compound units
Assessment Details	Trigonometry Indices Probability End Point – Summative of all 3	Formula Representing data End Point – Summative of all 2 + HT1	– Graphs Similar Shapes End Point – Summative of all 2 + T1	– Quadratics, Direct & inverse Proportion Volume and Surface area End Point – Summative of all and previous	Inequalities (HIGHER Surds Compound units End Point – Summative of all 3 and previous topics	– Trigonometry + Construction Bounds End Point – Summative of all 3 and previous .
Misconceptions	Ensure that all students are aware of the importance of their scientific calculator being in degrees mode. Ensure that students do not round until the end of a multi-step calculation	Pupils should build on the experiences of using the grid method to expand products of more than two binomials. Eg $(x + 2)(x + 3)(x - 4) = (x^2 + 5x + 6)(x - 4) = x^3 + x^2 - 14x - 24$	Common approaches <i>Pupils are taught to use positive numbers wherever possible to reduce potential difficulties with substitution of negative numbers .Students plot points with a 'x' and not 'dot.Students draw graphs in pencil</i>	Common approaches <i>All students are taught to use the grid method to multiply two linear expressions. All students are taught to use the sum and product method to factorise quadratics.</i>	Common approaches <i>All Students are taught to manipulate algebraically rather than be taught 'tricks. For example, in the case of $-2x > 8$, students should not be taught to flip the inequality when dividing</i>	Common approaches <i>The <u>appropriate</u> mnemonic 'used to help students remember the trigonometric ratios</i> Misconceptions Some students may label opposite and adjacent in

	<p>This unit of trigonometry should focus only on right-angled triangles in two dimensions.</p> <p>Common approaches <i>The appropriate mnemonic 'used to help students remember the trigonometric ratios</i></p> <p>Misconceptions Some students may not appreciate the fact that adjacent and opposite labels are not fixed and are only relevant to a particular acute angle. In situations where both angles are given this can cause difficulties. Some students may not balance an equation such as $\sin 35 = 4/x$ correctly, believing that the next step is $(\sin 35)/4 = x$ Some students may think that $\sin^{-1}\theta = 1 \div \sin\theta$ Some students may think that $\sin\theta$ means $\sin \times \theta$</p> <p>Common approaches <i>Pattern sniffing is encouraged to establish the result $a^0 = 1$, $a^{-n} = 1/a^n$, i.e.</i> $2^3 = 2 \times 2 \times 2 = 8$, $2^2 = 2 \times 2 = 4$, $2^1 = 2$, $2^0 = 1$, $2^{-1} =$</p> <p><i>Use Grid method when multiplying surds</i></p> <p>Misconceptions Some students may think that negative indices</p>	<p>Teachers also need to help pupils 'see' the <u>difference of two squares</u> by using pictorial representation</p> <p>Common approaches <i>Students manipulate algebra tiles to explore factoring quadratics</i> <i>The difference of two squares is explained using visual representation</i></p> <p>Misconceptions Some pupils may incorrectly estimate the mean by dividing the total by the numbers of groups rather than the total frequency. Some pupils may incorrectly think that there can only be one model class.</p>	<p>Misconceptions When plotting linear graphs some pupils may draw a line segment that stops at the two most extreme points plotted Students may think that a sketch is a very rough drawing. It should still identify key features. Some students do not rearrange the equation of a straight line to find the gradient of a straight line. For example, they think that the line $y - 2x = 6$ has a gradient of -2.</p> <p>Misconceptions Many students will want to identify an additive relationship between two quantities that are in proportion and apply this to solve problems The word 'similar' means something much more precise in this context than in other contexts students encounter. This can cause confusion.</p>	<p>Misconceptions Once students know how to factorise a quadratic expression of the form $x^2 + bx + c$ they might overcomplicate the simpler case of factorising an expression such as $x^2 + 2x \equiv (x + 0)(x + 2)$ Many students may think that $(x + a)^2 \equiv x^2 + a^2$</p> <p>Common approaches <i>All students are taught to set up a 'proportion table' and use it to find the multiplier in situations involving direct proportion</i></p> <p>Misconceptions Many students will want to identify an additive relationship between two quantities that are in proportion and apply this to solve problems Some students may think that a multiplier always has to be greater than 1 Students will need to be reminded of the key formula, in particular the importance of the perpendicular height when calculating areas and the correct use of πr^2. Note: some students may only find the area of the three 'distinct' faces</p>	<p><i>by -2. They should be taught to add 2x to both sides.</i></p> <p>Misconceptions Some pupils may think that it is possible to multiply or divide both sides of an inequality by a negative number with no impact on the inequality (e.g. if $-2x > 12$ then $x > -6$) Some pupils may think that strict inequalities, such as $y < 2x + 3$, are represented by a solid, rather than dashed, line on a graph Some pupils may shade the incorrect region</p> <p>Common approaches <i>Pattern sniffing is encouraged to establish the result $a^0 = 1$, $a^{-n} = 1/a^n$, i.e.</i> $2^3 = 2 \times 2 \times 2 = 8$, $2^2 = 2 \times 2 = 4$, $2^1 = 2$, $2^0 = 1$, $2^{-1} =$</p> <p><i>Use Grid method when multiplying surds</i></p> <p>Misconceptions Some students may think that negative indices change the sign of a number, for example $2^{-1} = -2$ rather than $2^{-1} =$ Some students may think = Some students may think that</p>	<p>a non-right-angled triangle Some students may not balance an equation such as $5 = 4/\sin\theta$ correctly, believing that the next step is $\sin\theta = 5/4$ Some students may think that $\cos^{-1}\theta = 1 \div \cos\theta$</p> <p>Misconceptions When constructing the bisector of an angle some students may think that the intersecting arcs need to be drawn from the ends of the two lines that make the angle. When constructing a locus such as the set of points a fixed distance from the perimeter of a rectangle, some students may not interpret the corner as a point (which therefore requires an arc as part of the locus) The north elevation is the view of a shape from the north (the north face of the shape), not the view of the shape while facing north.</p> <p>Misconceptions Students think to get the highest value you use the highest bound not allowing for division likewise for finding the lower value</p>
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	<p>change the sign of a number, for example $2^{-1} = -2$ rather than $2^{-1} =$</p> <p>Common approaches <i>Students are taught not to simply fractions when finding probabilities of combined events using a tree diagram (so that a simple check can be made that the probabilities sum to 1)</i></p> <p>Misconceptions Some students may think that there are only three outcomes when two coins are flipped, or that there are only six outcomes when three coins are flipped Some students may think that there are 12 unique outcomes when two dice are rolled</p>			<p>when finding surface area.</p> <p>Common approaches <i>Students visualise and write down the shapes of all the faces of a prism before calculating the surface area.</i></p> <p>Misconceptions Some students will work out $(\pi \times r)^2$ when finding the area of a circle Some students may use the sloping height when finding cross-sectional areas that are parallelograms, triangles or trapezia Some students may confuse the concepts of surface area and volume</p>	<p>Some students may write $\sqrt{4} \times 3$ when they should write (or $\sqrt{4 \times 3}$)</p> <p>Common approaches <i>All students are taught to set up a 'proportion table' and use it to find the multiplier in situations involving direct proportion</i></p> <p>Misconceptions Many students will want to identify an additive relationship between two quantities that are in proportion and apply this to solve problems Some students may think that a multiplier always must be greater than 1</p>	
Homework	• SPARX	• SPARX	• SPARX	• SPARX	•	•

Focus / Term	Half Term One	Half Term Two	Half Term Three	Half Term Four	Half Term Five	Half Term Six
Year 10 FOUNDATION Topic Covered and End Points	<p>Geometry Angles Solve missing angle problems with straight lines, around a point, triangles & quadrilaterals Solve angles in polygons problems Solve missing angle problems involving alternate angles</p>	<p>Expanding and Factorising Expand single brackets Expand multiple single brackets and collect like terms Expand double brackets Factorise into a single bracket</p>	<p>Graphs Identify the lines $y = x$ and $y = -x$ and $y = c$ and $x = c$ Know that graphs of functions of the form $y = mx + c$, $x \pm y = c$ and $ax \pm by = c$ are linear</p>	<p>Rearrange Formula Substitute into a formula Substitute into a formula to find an unknown value (may not be the subject) Change the subject of a formula when one step is required</p>	<p>Inequalities Understand inequalities Find integer values that satisfy inequalities Represent linear inequalities on a number line</p>	<p>Construction Use ruler and protractor to construct triangles, and other shapes, from written descriptions Use ruler and compasses to construct the</p>

<p>Solve missing angle problems involving corresponding angles Solve missing angle problems involving co-interior angles Solve missing angle problems involving vertically opposite</p> <p><u>Indices</u> Adding and subtracting expressions with indices Simplifying algebraic expressions by multiplying indices Simplifying algebraic expressions by dividing indices Using the addition law for indices Using the addition and subtraction law for indices</p> <p><i>Fractional, negative index laws</i> Know and use the fact that $a^{-n} = 1/a^n$ Know and use the fact that $a^{1/n} = \sqrt[n]{a}$ Writing a number as a power of another</p> <p><u>Probability</u> List outcomes of an event systematically Use frequency trees to record outcomes</p>	<p>Solve missing angle problems involving corresponding angles Solve missing angle problems involving co-interior angles Solve missing angle problems involving vertically opposite</p> <p><u>Representing Data</u> (RECAP) Find the mean, median, mode and range of a set of data Find the range and modal class of set of grouped data and the class containing the median of a set of data Calculate an estimate of the mean from a frequency table Calculate an estimate of the mean from a grouped frequency table Construct and interpret graphs of time series Construct and interpret frequency polygons Construct and interpret stem and leaf diagrams Analyse and compare sets of data, appreciating</p>	<p>Factorise quadratics including difference of two squares Solve equations involving brackets Substitute into expressions (check solving by substitution)</p> <p><u>Similar Shapes</u> Convert between units of length Identify similarity of shapes in a range of situations Finding missing lengths in similar shapes</p>	<p>Plot graphs of functions of the form $y = mx \pm c$ Plot graphs of functions of the form $ax \pm by = c$ Find the gradient of a straight line on a unit grid Find the y-intercept of a straight line Sketch linear graphs Distinguish between a linear and quadratic graph Plot graphs of quadratic functions of the form $y = x^2 \pm c$ Sketch a simple quadratic graph</p>	<p>Change the subject of a formula when two steps are required Apply an understanding of inverse operation to a formula in order to make a specific variable the subject</p> <p><u>Proportion</u> Know and recognise the difference between direct and inverse proportion Solve problems involving direct proportion (best buys) Solve problems involving direct proportion (exchange rates) Solve problems involving direct proportion (recipes) Solve problems involving inverse proportion</p> <p><u>Area</u> Area and Perimeter of compound shape Area of Circles and parts of Circles Area of Trapezia Perimeter of compound shapes Pythagoras for triangles and trapezia</p>	<p>Solve one sided linear inequalities Solve two sided linear inequalities Find integer values that satisfy inequalities Shade inequalities of $x > a$ $y < b$ etc</p> <p><u>Standard Form</u> Recap – basic laws of indices Recap – powers of 10 Use standard form to write large numbers Use standard form to write small numbers Calculate with standard form Compare Standard Form Correct Standard Form</p> <p><u>Compound Measure and Interest</u> Convert between compound units of density and pressure Solve problems involving density Solve problems involving pressure Solve more complex problems involving speed</p>	<p>perpendicular bisector of a line segment, bisect an angle, construct a perpendicular to a line from a point and at a point Solve simple problems involving loci Combine techniques to solve more complex loci problems Construct a shape from its plans and elevations</p> <p><u>Bounds</u> Round to a given number of decimal places. Round to a given number of significant figures. Estimate answers to calculations. Know and understand limits of accuracy. Find Upper and Lower bounds Calculate with Upper and Lower bounds</p> <p><u>Angles in Polygons</u> Calculate Interior angles of polygons</p>
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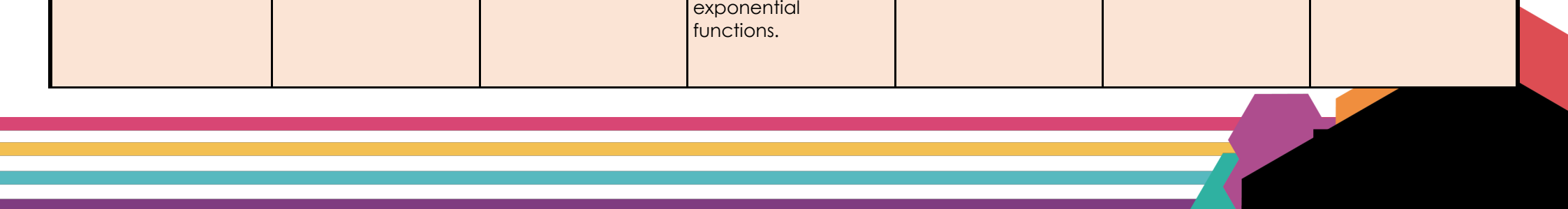
	<p>of probability experiments Use 2way tables to record outcomes of probability experiments List all elements in a combination of sets using a Venn diagram Use theoretical probability to calculate expected outcomes Use experimental probability to calculate expected outcomes Know and use the multiplication law of probability Now and use the addition law of probability Use a tree diagram to solve simple problems involving independent combined events Use a tree diagram to solve complex problems involving independent combined events Use a tree diagram to solve simple problems involving dependent combined events Use a tree diagram to solve complex</p>	<p>the limitations of different statistics (mean, median, mode, range) Interpret a scatter diagram using understanding of correlation use the line of best fit to estimate values</p>		<p>Circumference of circles Perimeter of semicircle and parts of circles Calculate and convert hectares</p> <p><u>Volume and Surface Area</u> Calculate volume of cubes and cuboids Calculate the volume of a prism <i>Calculate the volume a cylinder, including calculating exactly with multiples of π</i> Calculate surface area of cubes and cuboids Calculate the surface area of a prism <i>Calculate the surface area of a cylinder, including calculating exactly with multiples of π</i></p>	<p>Solve compound interest problems</p> <p><u>Trigonometry</u> Pythagoras recap Understand surd notation on a calculator. Choose an appropriate trigonometric ratio that can be used in each situation Understand that sine, cosine and tangent are functions of an angle Use a calculator to find the sine, cosine and tangent of an angle Know the trigonometric ratios, $\sin\theta = \text{opp/hyp}$, $\cos\theta = \text{adj/hyp}$, $\tan\theta = \text{opp/adj}$ Set up and solve a trigonometric equation to find a missing side in a right-angled triangle Set up and solve a trigonometric equation when the unknown is in the denominator of a fraction</p>	<p>Calculate Exterior angles of polygons Calculate size of interior angles of regular polygons Polygons and angles at a point</p>
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	problems involving dependent combined events				Set up and solve a trigonometric equation to find a missing angle in a right-angled triangle Use trigonometry to solve problems	
NC	Geometry Number	Algebra Data	Geometry Algebra	Geometry Number Algebra	Geometry Number	Geometry Number
Tier 3 Words	Alternate Corresponding Parallel Perpendicular Vertically Opposite Indices Powers Square Root Fractional Negative Reciprocal •	Quadratic Expand Factorise Co-efficient	Gradient Intercept Equation of the line Linear Quadratic Cubic Reciprocal	Substitute Value Subject Rearrange Exchange rates Best buy Direct Inverse	Function Sine Cosine Tangent Adjacent Hypotenuse	Loci Parallel Perpendicular Segment Arc
Long Term Retrieval	Students will complete a benchmark assessment	Angles Indices Probability	Angles Indices Probability Expand Factorise Representing data	Similarity Graphs Angles Indices Probability Expand Factorise Representing data	Proportion Formula Similarity Graphs Angles Indices Probability Expand Factorise Representing data	Standard Form Inequalities Proportion Formula Similarity Graphs Angles Indices Probability Expand Factorise Representing data

Misconceptions	Trigonometry Indices Probability End Point – Summative of all 3	Formula Representing data End Point – Summative of all 2 + HT1	– Graphs Similar Shapes End Point – Summative of all 2 + T1	– Quadratics, Direct & inverse Proportion Volume and Surface area End Point – Summative of all and previous	–. Inequalities (HIGHER Surds Compound units End Point – Summative of all 3 and previous topics	– Trigonometry + Construction Bounds End Point – Summative of all 3 and previous
Assessment Details						

Year 11 Higher Topic Covered and End Points	Statistics 2 Calculate and interpret the interquartile range Construct and interpret a box plot for discrete data Use box plots to compare distributions Construct a cumulative frequency table /curve Use a cumulative frequency curve to estimate properties of grouped continuous data sets Construct histograms (basic) for grouped data with unequal class intervals Use a histogram to find missing values in a frequency table	Formula- algebraic fractions Solving algebraic fractions Trig graphs & transformations Use Pythagoras' theorem in 3D. Use trigonometry in 3D. Solve bearings problems using trigonometry. Find the area of a triangle and a segment of a circle Proportion Congruence Understand the difference between congruence and similarity	Vectors Understand and represent vectors Use and read vector notation Draw and understand vectors multiplied by a scalar Functions, Iteration and proof Formal algebraic proof. Recurring decimals Kinematics Interpret the gradient of non-linear graph in curved distance–time and velocity–time graphs: for a non-linear distance–time graph, estimate the speed at one point in time,	Simultaneous equations graphs quadratics Understand that equations can have more than one solution Determine whether a given (x, y) is a solution to a pair of linear simultaneous equations Solve a pair of linear simultaneous equations by substituting a known variable Functions, Iteration Show that a solution to a complex equation lies between two given values Use an iterative formula to find	REVISION – Bespoke to individual class need	
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	<p>Use a sample to infer properties of a population Understand the limitations of sampling Use the product rule for counting</p> <p>Geometry Circle theorems Angles at the centre and circumference Angles in a semi-circle Angles in the same segment</p>	<p>Understand and use conditions for congruent triangles Prove a pair of triangles are congruent (H)</p> <p>Angles recap & bearings Understand and represent bearings Measure and read bearings Make scale drawings using bearings</p>	<p>from the gradient of the tangent, and the average speed over several seconds by finding the gradient of the chord; for a non-linear velocity–time graph, estimate the acceleration at one point in time, from the tangent, and the average acceleration over several seconds by finding the gradient of the chord; Interpret the gradient of a linear or non-linear graph in financial contexts; Interpret the area under a linear or non-linear graph in real-life contexts; Interpret the rate of change of graphs of containers filling and emptying; Interpret the rate of change of unit price in price graphs. Recognise graphs of exponential functions. Sketch graphs of exponential functions.</p>	<p>approximate solutions to equations Use an iterative formula to find approximate solutions, to a given number of decimal places, to an equation Understand the meaning of a function Know and use the notation for composite functions Find the inverse of a given function</p>		
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NC	Data Shape Algebra	Shape	Algebra Number	Algebra Number		
Tier 3 Words	Tangent Segment Sector	Congruence Similarity Bearings Scale	Vector Scalar Pythagoras Trigonometry	Variable Simultaneous Substitution Algebraic		
Long Term Retrieval	Starters and LSQ from areas of improvement in benchmark and Mock 1	Starters and LSQ from areas of improvement in benchmark and Mock 1	Starters and LSQ from areas of improvement in benchmark and Mock 1 and 2	Starters and LSQ from areas of improvement in benchmark and Mock 1 and 2		
Assessment Details	Benchmark/ End of topic assessments	End of topic assessments Mock 1	End of topic assessments Mock 2			
Misconceptions	Using the wrong rule Identifying angles at the centre	Only comparing one pair of similar sides and making assumption it is true for all	Using Pythagoras when Trig required. Identifying wrong angle	Taking one value as true and not testing both with second equation		
Homework	• SPARX	• SPARX	• SPARX	• SPARX	•	•

Year 11 Foundation Topic Covered and End Points	<p>PERCENTAGES Use non calculator methods for percentages Use calculators to increase/decrease an amount by a percentage Identify the multiplier for a percentage increase or decrease Use calculators to increase an amount by a percentage greater than 100%</p>	<p>Transformations Reflective and Rotational Symmetry. Translate a shape by a vector Rotate about a point Enlargement from a point Reflection in a line (Given and created) Describe single transformations Formulae</p>	<p>Graphs Identify the lines $y = x$ and $y = -x$ and $y = c$ and $x = c$ Know that graphs of functions of the form $y = mx + c$, $x \pm y = c$ and $ax \pm by = c$ are linear Plot graphs of functions of the form $y = mx \pm c$ Plot graphs of functions of the form $ax \pm by = c$</p>	<p>Equations and Inequalities Solve linear equations with the unknown on one side when calculating with negative numbers is required Solve linear equations with the unknown on both sides when the solution is a whole number</p>	<p>Vectors Know and use different notations for vectors, including diagrammatic representation Add and subtract vectors Multiply a vector by a scalar Area Recap Perimeter Convert between metric units</p>	
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	<p>Solve problems involving percentage change</p> <p>Solve original value problems when working with percentages</p> <p>Solve financial problems including simple and compound interest</p> <p>Growth and Decay</p> <p>Statistics 2</p> <p>Two-way Tables</p> <p>Venn Diagrams</p> <p>Pictograms</p> <p>Pie Charts</p> <p>Be able to find and interpret averages from a list (R)</p> <p>Be able to find and interpret averages from a frequency table</p> <p>Be able to find and interpret the mean from a grouped frequency table</p> <p>Be able to find the range and modal class of set of grouped data and the class containing the median of a set of data</p> <p>Be able to construct and interpret stem and leaf diagrams</p> <p>Be able to compare distribution using charts and measure</p>	<p>Be able to use function machine to calculate outputs</p> <p>Be able to use a function machine to calculate inputs</p> <p>Substitute into expression/formulae</p> <p>Find the value of an unknown in a formulae</p> <p>Congruence</p> <p>Establish two shapes are similar</p> <p>Understand the difference between congruence and similarity</p> <p>Understand and use conditions for congruence</p>	<p>Find the gradient of a straight line on a unit grid</p> <p>Find the y-intercept of a straight line</p> <p>Sketch linear graphs</p> <p>Distinguish between a linear and quadratic graph</p> <p>Plot graphs of quadratic functions of the form $y = x^2 \pm c$</p> <p>Sketch a simple quadratic graph</p> <p>Draw and interpret graphs of cubic functions. Draw and interpret graphs of $y = 1/x$. Draw and interpret non-linear graphs to solve problems.</p> <p>Ratio</p> <p>Write a ratio as a fraction (R)</p> <p>Write a ratio 1 : n</p> <p>Simplify a ratio</p> <p>Share an amount in ratio</p> <p>Find an amount with a ratio and a given amount</p> <p>Exam multi step questions including Fractions etc</p> <p>Real Life Graphs</p> <p>Draw straight line graphs for real-life situations, including ready reckoner graphs, conversion</p>	<p>Solve linear equations with the unknown on both sides when the solution is a negative number</p> <p>Solve linear equations with the unknown on both sides when the equation involves brackets</p> <p>Represent linear inequalities on a number line</p> <p>Angles in Parallel Lines Bearings</p> <p>Recap Angles around a point, on a line, vertically opposite and in a triangle</p> <p>Solve missing angle problems involving alternate angles</p> <p>Solve missing angle problems involving corresponding angles</p> <p>Use knowledge of alternate and corresponding angles to calculate missing angles in geometrical diagrams</p> <p>use the fact that the exterior angle of a triangle is equal to the sum of the two opposite interior angles</p>	<p>Calculate area of compound shapes</p> <p><i>Calculate the circumference of a circle when radius or diameter is given</i></p> <p><i>Calculate the perimeter of composite shapes that include sections of a circle</i></p> <p><i>Calculate the area of a circle when radius or diameter is given</i></p> <p><i>Calculate the area of composite shapes that include sections of a circle</i></p>	
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	<p>Fractions Find equivalent fraction/ simplify Compare and order fractions Convert between mixed and improper fractions Add and subtract fractions with same denominators Add and subtract fractions with different denominators <i>Add and subtract mixed numbers with different denominators</i> Apply addition to proper fractions, improper fractions and mixed numbers Apply subtraction to proper fractions, improper fractions and mixed numbers Multiply a proper fraction by a proper fraction <i>Multiply mixed numbers</i> Divide a proper fraction by a whole number <i>Divide mixed numbers</i> Increase/decrease by a fraction of an amount</p>		<p>graphs, fuel bills graphs, fixed charge and cost per unit Draw distance–time graphs Work out time intervals for graph scales Interpret distance–time graphs, and calculate: the speed of individual sections, total distance and total time Interpret information presented in a range of linear and non-linear graphs Interpret graphs with negative values on axes Find the gradient of a straight line from real-life graphs Interpret gradient as the rate of change in distance–time and speed–time graphs, graphs of containers filling and emptying, and unit price graphs.</p>	<p>Bearings Quadratics Plot and recognise graphs of quadratic functions Find the solution to a quadratic by factorising and making = 0 Use the quadratic formula to find solutions to a quadratic Use quadratic graphs to solve problems.</p>		
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	Find a starting amount after an Increase/decrease by a fraction Convert between fraction to decimal and percentage					
NC	Number Data	Geometry Algebra	Algebra Number	Geometry Algebra	Geometry	
Tier 3 Words	Percent Exponent Compound interest: Depreciation: Mean Mode: Median: Range Percent Fraction Denominator	Transformation Reflection: Translation Vector Rotation Variable Rearrange Inverse operation: Substitute Evaluate Congruence Similarity	Quadrant. Coordinate: Horizontal: Vertical: Origin Ratio: Equivalent Divide	Solution: Variable: Equation Substitute Cardinal directions: Angle: Bearing: Perpendicular	Area Perimeter: Compound shape Circumference	
Long Term Retrieval						
Assessment Details	Benchmark End of topic assessments	End of topic assessments Mock 1	End of topic assessments Mock 2	End of topic assessments Mock 3		
Misconceptions						
Homework	• SPARX	• SPARX	• SPARX	• SPARX	•	•





Sir William Stanier School

Use the following prompts to develop your curriculum intent.

Values: What are the school values? Where are these promoted and developed within your curriculum? What examples can you provide?

Sequencing: How have you sequenced your curriculum? Why has it been arranged in this way? What evidence/literature supports your decision? What examples in your curriculum support your claims? *An opportunity to discuss how component knowledge is building to form composite knowledge, once again, with examples.*

Spacing: Where are the big ideas within your subject revisited across the 5 years and why are they revisited at this time?

Disciplinary Knowledge: Understanding about how knowledge is established, verified and revised. Where is this imparted? How is it developed across the 5 years? *Refer to the curriculum jargon buster for supporting examples.*

Powerful Knowledge: How are students' experiences enriched. What knowledge do you share that takes students beyond their lived experience and how do you ensure they remember this powerful knowledge? *Think hard about the most important knowledge within your curriculum, which our students would not encounter in their daily lives. Where do they revisit it?*

End Points: What end points are children working towards? How are these assessed? How does this inform teaching? How do you know?

[Top 10 messages since the last inspection](#)

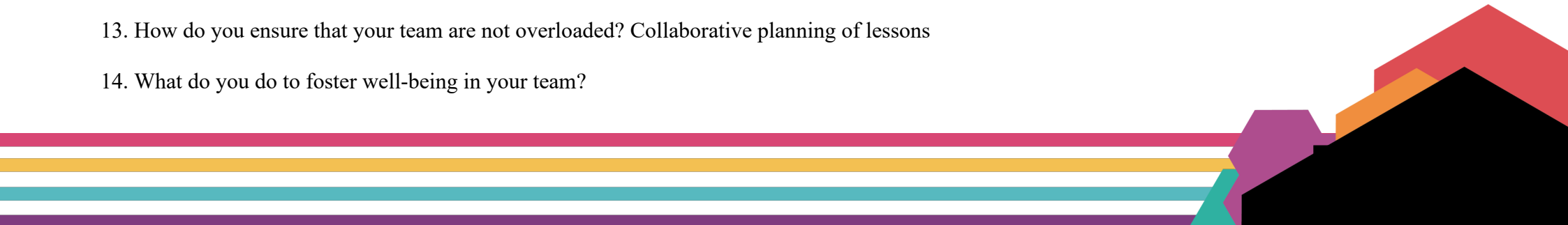


Five questions every faculty member should be able to answer



20 questions asked of Curriculum Leaders during a Deep Dive Conversation

1. Are you following the national curriculum at KS3? Yes
2. How does the curriculum content in Year 7 build on the Key Stage 2 national curriculum? How do you know? Having knowledge of KS2 National Curriculum and using White Rose which builds on its own KS2 scheme
3. How are the school values embedded into your curriculum? The powerful knowledge and careers
4. What are you teaching at the minute in Year 9?
5. How is this linked to previous learning?
6. How do you decide what order to teach topics in? Using white rose as basis to ensure that topics are taught so that required knowledge is taught to be used later on. Some units are rearranged for Student Need and also to improve engagement. If two or three Number units for example are scheduled in a row, then this can lead to disengagement of students
7. How do you support ECTs / non-specialists? White rose have teaching slides for each small step, also collaborative planning of lessons and CPD
8. How do you check the quality of teaching across the school in your curriculum area? QA of work scrutiny, drop ins
9. How often do you collect assessment information? twice every half term
10. What do you do with this information? QLA of termly assessment, then used to inform Recall starters
11. What end points are you building towards?
12. How do you ensure that students who fall behind catch up? Reteach if whole class, LSQ for Year 11, Recall starters
13. How do you ensure that your team are not overloaded? Collaborative planning of lessons
14. What do you do to foster well-being in your team?



15. How do you prepare pupils for the next stages in their education?

16. How does your curriculum build cultural capital?

17. How do you ensure access to high quality CPD for your department? Give examples of training that has led to a sustained improvement in teaching and learning.

18. How is your area developing students' love of reading?

19. How do you keep your knowledge and leadership of the curriculum up to date?

20. How is your area working towards improving the attendance across the school?

