

SCHEME F

Autumn 1 Y10	Spring 1 Y10	Summer 1 Y10	Autumn 1 Y11
Angle reasoning	Circumference and area	2D representations of 3D shapes	Algebra: quadratics
Calculate angles on a straight line, at a point, vertically opposite	Identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference, tangent, arc, sector and segment (G9)	Be able to draw nets and work out surface areas (G13)	Expand and simplify double brackets inc. involving surds (see scheme tests 3,5,6) (A4)
Calculate angles in triangles. Be able to demonstrate angles add to 180 and include the rule that the exterior angle equals the sum of the two other interior angles	Calculate circumferences and areas of circles and perimeters/areas of compound shapes (including answers as multiples of π) (G17)	Understand and use isometric drawings (G13)	Simplify expressions involving sums, products and powers, including the laws of indices (recap from Year 10) (N7)
Use alternate and corresponding rules to calculate angles in parallel lines	Calculate surface area of spheres, cones and composite solids including frustums (including answers as multiples of π) (G17)	Construct and interpret plans and elevations of 3D shapes (G13)	Factorise quadratic expressions of the form x^2+bx+c , including the difference of two squares (A4)
Problem solving questions with angles in parallel lines (may include algebra)	Calculate arc lengths, angles and areas of sectors of circles (G18)		
Scale diagrams and bearings	Ratio & proportion	Calculating with percentages	Algebra: Rearranging formulae, identities
Be able to measure, draw, label, describe angles	Establish the link between ratios and fractions, including in geometrical problems (see N11 for examples)	Calculate amounts using percentage or fraction multipliers (N12) including simple interest problems (R9)	Form expressions and equations. Use algebra to support and construct arguments (A6)
Be able to use a scale to find a distance (eg on a map or scale drawing)	Reduce ratios to simplest form and write ratios in form 1:n or n:1 (R4)	Percentage increase/decrease problems eg a price goes from £40 to £45, what is the % increase? (R9)	Interpret simple expressions as functions with inputs and outputs (no need to teach function notation) (A7)
Be able to measure and draw bearings (including the eight main compass points)	Apply ratio (unitary method) to real contexts and problems (such as those involving sharing, conversion, comparison, scaling, mixing, best buys and concentrations) (R5)	Original value problems (R9)	Use and rearrange formulae where the subject appears once including unfamiliar formulae in words or symbols (A5)
Be able to calculate bearings using angle reasoning	Represent the ratio of two quantities in direct proportion as a linear relationship, including graphically (R8)		Know the difference between an equation and an identity. Show that two expressions are equivalent; equate coefficients in simple identities (A6)
Be able to solve bearing problems and calculate back bearings			
Basic number skills	Properties of polygons	Measures	Vectors
Put pos & neg integers in order (eg temperatures)	Derive and apply the properties and definitions of triangles (G4)	Apply and interpret limits of accuracy (upper and lower bounds) (N16)	Understand and use vector notation (G25)
Order of operations (BIDMAS)	Derive and apply the properties and definitions of quadrilaterals (G4)	Understand metric conversions in length, area, volume and mass (N13); use to solve problems in context	Add and subtract vectors (G25)
Formal written methods for the four operations with positive integers (including in context)	Be able to identify polygons by name and establish rules for calculating interior and exterior angles (G3)	Use imperial/metric conversions to solve problems in context (N13)	Multiply vectors by a scalar (G25)
Four operations with negative integers (including in context eg credit/debit)	Angle problems involving interior and exterior angles (G3)	Understand and use compound measures and compound units including area, volume, speed, rates of pay, density and pressure (R11)	Work out simple vector journeys (G25)
Factors, multiples and primes	Equations	Statistical measures (non-grouped data)	Algebra and graphs

Be able to work out factors and multiples of numbers and identify primes		Substitute numerical values into formulae and expressions, including scientific formulae (A2). A2	Find appropriate measures of average : be able to work out mean, median, mode from a set of numbers. Calculate range and know that it measures spread (S4). S4	Find approximate solutions to linear equations using a graph (A17) A17
Be able to find the prime factorisation of any number and write the product in index form		Solve linear equations in one unknown (including use of brackets, answers may be negative/fractions) (A17) A17	Calculate mean, median, mode from a discrete frequency distribution (shown in a diagram or a table)(S4) S4	Derive an equation, solve the equation and interpret the solution (A21) A21
Use Venn diagram to work out HCF and LCM of 2 numbers		Solve linear equations with the unknown on both sides (may include brackets and fractions, answers may be negative/fractions) (A17) A17	Apply measures of average and spread to describe and compare populations (including samples). Know the limitations of sampling (S5,S1) S5	nb the topic test for this chapter includes simultaneous equations which haven't been done yet!
HCF and LCM worded questions in context				
Basic algebraic expressions		Indices	Scattergraphs	Simultaneous equations
Know meaning of terms, factors, expressions, formulae, equations, inequalities, identities (A3) A3		Recall and use square numbers and their roots (up to 15x15), cube numbers and their roots (1,2,3,4,5 & 10) (N6) N6	Use and interpret scattergraphs of bivariate data (S6) S6	Solve two simultaneous equations algebraically (A21) A21
Construct simple algebraic expressions in context (A4)		Calculate and recognise powers of 2,3,4,5 and 10 (calc or non) (N6, see topic test) N6	Recognise correlation and know that it does not indicate causation (S6) S6	Derive two simultaneous equations, solve them and interpret the solution (A21) A21
Collecting like terms and simplifying (A4) A4		Solve equations such as $x^2 = 25$, giving both pos/neg roots; calculations with roots and positive integer indices (N7) N7	Draw estimated lines of best fit and make predictions (S6) S6	Identify the solution to a pair of simultaneous equations by substitution (see topic test); find the solution to simultaneous equations graphically (A21) A21
Multiply out single bracket, including more than one + simplify, and introduce identity notation (A4)		Use index laws for multiplication and division of integer powers (N7) N7	Interpolate and extrapolate apparent trends whilst knowing the danger of doing so (S6) S6	
Factorise single brackets and use identity notation (A4)				
Fraction Calculations				Trigonometry
Equivalent fractions and ordering fractions				Know and use the trigonometric ratios sin, cos, tan (G20) G20
Adding & subtracting fractions / mixed numbers leaving answers in simplest form				Know and use the exact values of sin, cos, tan for 0, 30, 45, 60, and sin/cos 90, see topic test (G21) G21
Multiplying / dividing fractions /mixed numbers leaving answers in simplest form				Apply SOHCAHTOA to find lengths and angles in right angles triangles (G20) G20
Problem solving questions involving fractions				
Coordinates & Linear Graphs				Quadratics
Solve geometrical problems involving coordinates (including finding midpoints of lines) (A8) A8				Solve quadratics by factorising (A18) A18
Plot a line given its equation using a function machine and/or a table of values (A9) A9				Find approximate solutions using a graph (A18) A18
Understand gradient and y intercept (parallel lines have equal gradients) and link it to the equation of a line in $y = mx + c$ form (A9) A9				Recognise, sketch and interpret graphs of quadratic functions (A12) A12

Find the equation of a line between two points or through one point with a given gradient (A9)	A9				Identify and interpret roots, intercepts and turning points of quadratic functions graphically (A11)	A11	
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Basic Decimals		Standard form		Probability		Direct and inverse proportion	
Order positive and negative decimals (N1)	N1	Be able to write large and small numbers in standard form (and vice versa) (N9)	N9	Work out relative frequencies and relate these to theoretical probabilities (P3)	P3	Solve simple problems involving direct and inverse proportion, including graphical and algebraic representations (R10)	R10
Four operations with decimals (focus on questions in context eg worded questions) (N2)	N2	Order and calculate with numbers in standard form (N9)	N9	Understand (preferably by experiment) that relative frequencies tend towards theoretical probabilities as you increase the sample size (P5)	P5	Don't do the topic test - too hard!	
Convert between terminating decimals and fractions including ordering lists of decimals and fractions (N10)	N10	Solve simple equations involving numbers in standard form (N9)	N9	Construct and work out probabilities from Venn diagrams(P6)	P6		
Use the answer to one calculation involving decimals to work out the answer to a related calculation (N2)	N2	Solve standard form problems (calc & non-calc) (N9)	N9	Construct and work out probabilities from tree diagrams (with and without replacement)			
Rounding		Basic probability		Volume		Sketching graphs	
Round numbers using decimal places (N15)	N15	Record, describe and analyse probability experiments using tables and frequency trees (P1)	P1	Compare lengths, areas and volumes in similar shapes using ratio notation (R12) (nb don't need to teach LSF, ASF, VSF - this is higher only)	R12	Recognise, sketch and interpret graphs of linear functions (A12)	A12
Round numbers using significant figures (N15)	N15	Apply the property that probabilities add up to 1 (P4)	P4	Know and apply formulae to calculate volume of cuboids and other right prisms inc cylinders (G16)	G16	Recognise, sketch and interpret graphs of quadratic functions, simple cubic functions and the reciprocal function ($y=1/x$) (A12)	A12
Use inequality notation to write error intervals due to rounding or truncation (N15)	N15	Calculate probabilities using diagrams eg two-way tables, frequency trees (P7)	P7	Apply formulae to calculate volume of sphere, pyramid, cone and composite solids (formulae given) (G17)	G17		
Calculations with upper and lower bounds (N16)	N16			Calculate exactly using multiples of π (N8)	N8		
Collecting and Representing Data		Pythagoras		Inequalities		Growth and decay	
Know and understand the types of data: primary, secondary, qualitative, discrete and continuous (S4)	S4	Know the formula for Pythagoras' Theorem $a^2+b^2=c^2$ (G20)	G20	Show inequalities on a number line using the conventions (open circle/closed circle)		Set up, solve and interpret the answers in growth and decay problems, including compound interest	
Interpret and construct tables, charts and diagrams including frequency tables, bar charts (inc dual, composite), vertical line charts & pictograms (S2) for non-grouped data only	S2	Apply it to find lengths in right angled triangles in two dimensional figures (G20)	G20	Solve linear inequalities of the form $ax+b \leq c$ and represent solution on a number line			
Interpret and construct pie charts (S2) for non-grouped data only	S2	Problem solving with Pythagoras (G20)	G20	Solve linear inequalities of the form 'write down all integers that satisfy eg $-12 < 3n < 6$ ', and represent solution on number line			
Interpret and construct tables and line graphs for time series data (S2)	S2						
Sequences		Constructions and loci		Statistical measures (grouped data)			

Generate terms of a sequence from either a term-to-term or a position-to-term rule including from patterns and diagrams (A23)	A23	Make scale drawings from a sketch, diagram or description (G2)	G2	Know when to group data + pros/cons; construct a grouped frequency table from real data (with inequality signs for groups) (S4)	S4		
Deduce expressions to calculate the n th term of a linear sequence (A25)	A25	Construct the three types of perpendicular (bisector, from a point on/off the line) (G2)	G2	Draw/interpret equal width histogram and identify modal category (S4)	S4		
Recognise and find the next term of Fibonacci-type, quadratic and geometric sequences (A24)	A24	Construct angle bisector and 60 degree angle (G2)	G2	Find estimated mean from a grouped frequency distribution (S4)	S4		
Generate terms of simple geometric progressions in the form r^n (r is rational, $n > 0$) (A24)	A24	Use constructions to solve loci problems (G2)	G2	Identify the interval containing the median from a grouped frequency table/histogram (S4)	S4		
Basic Percentages		Transformations					
Equivalence of FDP (R9)	R9	Reflection inc from mirror line eqns (horizontal, vertical, 2 main diagonals), rotation (G7); translation inc from column vector (G7/24)	G7				
Calculating percentages in real life contexts (including percentages > 100) (R9)	R9	Enlargement inc from a centre and fractional sf (G7)	G7				
		Describe fully the four transformations (G7); understand the link with congruence/similarity	G7				
Write one quantity as a percentage of another (R9)	R9						
Perimeter and Area		Congruence and similarity					
Calculations involving the perimeter of 2D shapes including composite shapes and algebraic questions (G17)		Construct triangles using protractor and compasses (ASA, SSS). Also isosceles using perp bisector and equilat using 60 deg construct.					
Know and apply formulae to calculate the area of triangles, parallelograms and trapezia (G16)		Identify congruent and similar shapes					
Calculate the area of composite shapes (G17)		Justify that two triangles are congruent by using SSS, SAS, ASA, RHS. (G5)	G5				
Find the surface area of pyramids and composite solids (G17)		Find missing lengths in similar figures using scale factor or ratio (G19)	G19				
Real life graphs							
Plot a graph representing a real life problem (A14)	A14						
Read and interpret linear graphs in real-life contexts eg gas rates, council tax, conversion graphs etc (including interpreting gradient as a rate of change) (A14, R14)	A14						
Plot and interpret distance-time graphs (A14)	A14						
Interpret graphs of non-standard functions eg filling different shape containers, height of a ball bouncing (A14)	A14						