Y11H

HT1 — 6.5 weeks

	S4 (Block 5) 2 weeks	D2 (Block 5) 2 weeks	S3 (Block 5) 2 weeks
	G8, 10 Identify, describe and perform transformations of shapes on a set of axes. Rotation, reflection, translation, enlargement (including negative and fractional scale factors) - explain invariance achieved by combinations of rotations, reflections and translations.	P5, P7 Understanding and using theoretical and experiemenal probabilities (including relative frequency), and that unbiased experimental samples tend towards theoretical probabilities with increasing sample size.	G1, 2, 15 Review constructions, applications to loci, bearings and scale drawing. Review of plans, elevations.
	GS,6,7 Geometric proof using congruence, circle theorems.	P4 Apply the concept of the probabilities of an exhaustive set of outcomes (and an exhaustive set of mutually exclusive outcomes) sum to one, also in algebraic contexts	Review basic Pythagoras and trigonometry here in context to further understanding prior to S2. Graphs of trigonometric functions (A12) and understand their properties such as period.
	G24, 25 Further vectors and geometric proof using vectors.	P7, P8, P9 Tree diagrams review: dependent and independent events, finding probabilities for a single event given a combined probability, algebraic probability problems involving unknown sample sizes	
	A12 Graph transformations (translations and reflections only), emphasis on function notation and link to how it changes algebraic equation of graph	N5 Product rule for counting	
		P6 Venn diagrams review - set notation, calculating probabilities	
		P9 Conditional probability.	
Common misconceptions	Stating more than one transformation for 'describe the single transformation which...' questions.	Trial and error with problems which should be approached algebraically	Changing width of compass between steps, using a severely rounded value in multi step problems leading to inaccurate answers.
NC Codes	G9. G10. GS. G6. G7. G24. G25. A12	P5. P6. P7. P8. P9. P4. P3	G1. G2. G15. G20. G21. A12
Key Words	Tier 2: Transform, combination, proof, vector. Tier 3: geometric, graph transformation, invariance, scale factor	Tier 2: Bias, unbiased, event, theoretical. Tier 3: Probability, outcome, expected success, relative frequency, tree diagram, sample space, venn diagram, set notation, mutually exclusive.	Tier 2: construct, scale, plan, elevation. Tier 3: Bearing, loci, bisect, hypotenuse, period (of a function), trigonometry
Homework	Sparx maths tasks linked to current topic and ability of classes	Sparx maths tasks linked to current topic and ability of classes	Sparx maths tasks linked to current topic and ability of classes
Career links	Construction Manaaer https://www.unifrog.org/student/careers/school-subjects/construction-manager	Credit Risk Analyst https://www.unifrog.org/student/careers/school-subjects/credit-analyst	Structural Engineer https://www.unifrog.org/student/careers/school-subjects k1/structural-engineer
Employability skills	Aiming high / Numeracy; Creativity / Literacy; Independence; Listening / Communication; Presenting / Teamwork; Problem solving / Staying positive; Leadership	Aiming high / Numeracy; Creativity / Literacy; Independence; Listening / Communication; Presenting / Teamwork; Problem solving / Staying positive; Leadership	Aiming high / Numeracy; Creativity / Literacy; Independence; Listening / Communication; Presenting / Teamwork; Problem solving / Staying positive; Leadership
Assessment	S4 in class formal assessment, followed by common misconceptions and corrections lesson.	D2 in class formal assessment, followed by common misconceptions and corrections lesson.	S3 in class formal assessment, followed by common misconceptions and corrections lesson.

Half Term Assessment: Units S4, D2, S3

HT2 — 7 Weeks

	N5 (Block 5) 3 weeks + Mocks	S2 (Block 5) 2 weeks
	N4 Recap prime factorisation (including FACT button on calc), finding HCF and LCM for all numbers, including those given in index form (e.g. by using a venn diagram)	G16, G20, G21, G22, G23 Pythagoras and trigonometry full review
	N7 Recap fractional and negative indices, including fractional negative indices. Solving questions involving writing an equation in terms of a single power of an integer	Pythagoras and right angled trigonometry in 2D, 3D shapes and in context, trigonometry exact values
	N8 Surds full review, simplifying, expanding brackets with surds, rationalising denominators. Using surd values in calculations to maintain accuracy.	Non right angled trigonometry including sine rule (and ambiguous case), cosine rule, and A=0.5absinC
	N1/9 Standard form review.	G9, G10, G1, G3 Apply and prove circle theorems, justifying methods with accurate reasoning
Common misconceptions	Assuming a negative index results in a negative value, confusing negative and fractional indices.	Using an incorrect side when interpreting 'the angle between side AB and the plane DEFG' in 3D trigonometry.
NC Codes	N4. N7. N8. N1. N9	G1. G3. G16. G20. G21. G22. G23. G9. G10
Key Words	Tier 2: factor, common, multiple. Tier 3: highest common factor, lowest common multiple, prime number, square number, square root, indices, factorisation, standard form. Tier 3: Reciprocal	Tier 2: Estimate, measure, calculate, construct, scale, regular, parallel, ambiguous, deduce, interior, exterior, accurate, cyclic. Tier 3: alternate, isosceles, equilateral triangle, quadrilateral, polygon, bisect, theorem, arc, sector, exact.
Homework	Sparx maths tasks linked to current topic and ability of classes	Sparx maths tasks linked to current topic and ability of classes
Career links	Naval Architecht https://www.unifrog.org/student/careers/school-subjects k1/naval-architect	Product Designer https://www.unifrog.org/student/careers/school-subjects/electrician
Employability skills	Aiming high / Numeracy; Creativity / Literacy; Independence; Listening / Communication; Presenting / Teamwork; Problem solving / Staying positive; Leadership	Aiming high / Numeracy; Creativity / Literacy; Independence; Listening / Communication; Presenting / Teamwork; Problem solving / Staying positive; Leadership
Assessment	N3 in class formal assessment, followed by common misconceptions and corrections lesson.	S2 in class formal assessment, followed by common misconceptions and corrections lesson.

Mocks wc 31/10 and 7/11, Practice Papers throughout half term

HT3 — 6.5 weeks

Alongside extensive use of past papers, practice papers and other exam preparation materials, the focus areas for topic based revision should be number and statistics. Edexcel Specification Statements below for teacher awareness, and the chosen topics should be based upon QLA from mock exams and assessments, alongside requests from pupils. This could be done in starters, for homework, or as partial/full lessons to provide variety and consolidation for pupils in the approach to examinations.

Number and Statistics Focus

	Fractions, decimals and percentages	S1
N1 order positive and negative integers, decimals and fractions; use the symbols =, ≠, <, >, ≤, ≥		infer properties of populations or distributions from a sample, while knowing the limitations of sampling
N2 apply the four operations, including formal written methods, to integers, decimals and simple fractions (proper and improper), and mixed numbers	N10 work interchangeably with terminating decimals and their corresponding fractions	S2 interpret and construct tables, charts and diagrams, including frequency tables, bar charts, pie charts and pictograms for categorical data, vertical line charts for ungrouped discrete numerical data, tables and line graphs for time series data and know their appropriate use
– all both positive and negative; understand and use place value (e.g. when working with very large or very small numbers, and when calculating with decimals)	N11 identify and work with fractions in ratio problems	S4 interpret, analyse and compare the distributions of data sets from univariate empirical distributions through:
N3 recognise and use relationships between operations, including inverse operations (e.g. cancellation to simplify calculations and expressions); use conventional notation for priority of operations, including brackets, powers, roots and reciprocals	N12 interpret fractions and percentages as operators	● appropriate graphical representation involving discrete, continuous and grouped data
N4 use the concepts and vocabulary of prime numbers, factors (divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation theorem	**Measures and Accuracy**	● appropriate measures of central tendency (median, mean, mode and modal class) and spread (range, including consideration of outliers)
N5 apply systematic listing strategies	N13 use standard units of mass, length, time, money and other measures (including standard compound measures) using decimal quantities where appropriate	S5 apply statistics to describe a population
N6 use positive integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5	N14 estimate answers; check calculations using approximation and estimation, including answers obtained using technology	S6 use and interpret scatter graphs of bivariate data; recognise correlation and know that it does not indicate causation; draw estimated lines of best fit; make predictions; interpolate and extrapolate apparent trends while knowing the dangers of so doing
N7 calculate with roots, and with integer indices	N15 round numbers and measures to an appropriate degree of accuracy (e.g. to a specified number of decimal places or significant figures); inequality notation to specify simple error intervals due to truncation or rounding	
N8 calculate exactly with fractions and multiples of π	N16 apply and interpret limits of accuracy	
N9 calculate with and interpret standard form A × 10n, where 1 ≤ A < 10 and n is an integer		
Assessment	**Mocks wc 9/1 and 16/1, Practice Papers throughout half term**	
Enrichment	Intermediate Mathematical Challenge (29th January 2025)	

HT4 — 5 weeks

Alongside extensive use of past papers, practice papers and other exam preparation materials, the focus areas for topic based revision should be probability and shape. Edexcel Specification Statements below for teacher awareness, and the chosen topics should be based upon QLA from mock exams and assessments, alongside requests from pupils. This could be done in starters, for homework, or as partial/full lessons to provide variety and consolidation for pupils in the approach to examinations.

Probability and Shape Focus

	G1 use conventional terms and notations: points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons and polygons with reflection and/or rotation symmetries; use the standard conventions for labelling and referring to the sides and angles of triangles; draw diagrams from written description	**Mensuration and calculation**
P1 record, describe and analyse the frequency of outcomes of probability experiments using tables and frequency trees	G2 use the standard ruler and compass constructions (perpendicular bisector of line segments, constructing a perpendicular to a given line from/at a point, bisecting a given angle); use these to construct figures and to solve loci problems; know that the perpendicular distance from a point to a line is the shortest distance to the line	G14 use standard units of measure and related concepts (length, area, volume/capacity, mass, time, money, etc.)
P2 apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future experiments	G3 apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles; understand and use alternate and corresponding angles on parallel lines; derive and use the sum of angles in a triangle (e.g. to deduce and use the angle sum in any polygon, and to derive properties of regular polygons)	G15 measure line segments and angles in geometric figures, including interpreting maps and scale drawings and use of bearings
P3 relate relative expected frequencies to theoretical probability, using appropriate language and the 0-1 probability scale	G4 derive and apply the properties and definitions of: special types of quadrilaterals, including square, rectangle, parallelogram, trapezium, kite and rhombus; and triangles and other plane figures using appropriate language	G16 know and apply formulae to calculate: area of triangles, parallelograms, trapezia; volume of cuboids and other right prisms (including cylinders)
P4 apply the property that the probabilities of an exhaustive set of outcomes sum to one; apply the property that the probabilities of an exhaustive set of mutually exclusive events sum to one	G5 use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS)	G17 know the formulae: circumference of a circle = 2πr , area of a circle = πr² ; calculate: perimeters of 2D shapes, including circles; areas of circles and composite shapes; surface area and volume of spheres, pyramids, cones and composite solids
P5 understand that empirical unbiased samples tend towards theoretical probability distributions, with increasing sample size	G6 apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive results about angles and sides, including Pythagoras' theorem and the fact that the base angles of an isosceles triangle are equal, and use known results to obtain simple proofs	G18 calculate arc lengths, angles and areas of sectors of circles
P6 enumerate sets and combinations of sets systematically, using tables, grids, Venn diagrams and tree diagrams	G7 identify, describe and construct congruent and similar shapes, including on coordinate axes, by considering rotation, reflection, translation and enlargement (including fractional and negative scale factors)	G19 apply the concepts of congruence and similarity, including the relationships between lengths, areas and volumes in similar figures
P7 construct theoretical possibility spaces for single and combined experiments with equally likely outcomes and use these to calculate theoretical probabilities	G8 describe the changes and invariance achieved by combinations of rotations, reflections and translations	G20 know the formulae for: Pythagoras' theorem and the trigonometric ratios, apply them to find angles and lengths in right-angled triangles and, where possible, general triangles in two and three dimensional figures
P8 calculate the probability of independent and dependent combined events, including using tree diagrams and other representations, and know the underlying assumptions	G9 identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference, tangent, arc, sector and segment	G21 Exact values for sin cos tan of 0, 30, 45, 60, 90
P9 calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams	G10 apply and prove the standard circle theorems concerning angles, radii, tangents and chords, and use them to prove related results	G22 Know and apply the sine rule and cosine rule
	G11 solve geometrical problems on coordinate axes	G23 know and apply A = 0.5absinC
	G12 identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and spheres	G24 describe translations as 2D vectors
	G13 construct and interpret plans and elevations of 3D shapes	G25 apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representations of vectors; use vectors to construct geometric arguments and proofs
Assessment	**Mocks wc 6/3 and 13/3, Practice Papers throughout half term**	

HT5 — 6 weeks

Alongside extensive use of past papers, practice papers and other exam preparation materials, the focus areas for topic based revision should be algebra, notably reasoning and proof skills. Edexcel Specification Statements below for teacher awareness, and the chosen topics should be based upon QLA from mock exams and assessments, alongside requests from pupils. This could be done in starters, for homework, or as partial/full lessons to provide variety and consolidation for pupils in the approach to examinations.

Algebra Focus

	A13 sketch translations and reflections of a given function	**Solving equations and inequalities**
A1 use and interpret algebraic manipulation, including: ab, 3y, a²b, a/b, coefficients as fractions rather than decimals and brackets		
A2 substitute numerical values into formulae and expressions, including scientific formulae	A14 plot and interpret graphs (including reciprocal graphs and exponential graphs) and graphs of non-standard functions in real contexts to find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration	A17 solve linear equations in one unknown algebraically (including those with the unknown on both sides of the equation); find approximate solutions using a graph
A3 understand and use the concepts and vocabulary of expressions, equations, formulae, identities, inequalities, terms and factors	A15 calculate or estimate gradients of graphs and areas under graphs (including quadratic and other non-linear graphs), and interpret results in cases such as distance-time graphs, velocity-time graphs and graphs in financial contexts (this does not include calculus)	A18 solve quadratic equations (including those that require rearrangement) algebraically by factorising, by completing the square and by using the quadratic formula; find approximate solutions using a graph
A4 simplify and manipulate algebraic expressions (including those involving surds and algebraic fractions) by:	A16 recognise and use the equation of a circle with centre at the origin; find the equation of a tangent to a circle at a given point	A19 solve two simultaneous equations in two variables (linear/linear or linear/quadratic) algebraically; find approximate solutions using a graph
● collecting like terms ● multiplying a single term over a bracket ● taking out common factors ● expanding products of two or more binomials	**Graphs**	A20 find approximate solutions to equations numerically using iteration
● factorising quadratic expressions of the form x² + bx + c, including the difference of two squares; factorising quadratic expressions of the form ax² + bx + c	A8 work with coordinates in all four quadrants	A21 translate simple situations or procedures into algebraic expressions or formulae; derive an equation (or two simultaneous equations), solve the equation(s) and interpret the solution
● simplifying expressions involving sums, products and powers, including the laws of indices	A9 plot graphs of equations that correspond to straight-line graphs in the coordinate plane; use the form y = mx + c to identify parallel and perpendicular lines; find the equation of the line through two given points or through one point with a given gradient	A22 solve linear inequalities in one or two variable(s), and quadratic inequalities in one variable; represent the solution set on a number line, using set notation and on a graph
A5 understand and use standard mathematical formulae; rearrange formulae to change the subject	A10 identify and interpret gradients and intercepts of linear functions graphically and algebraically	**Sequences**
A6 know the difference between an equation and an identity; argue mathematically to show algebraic expressions are equivalent, and use algebra to support and construct arguments and proofs	A11 identify and interpret roots, intercepts, turning points of quadratic functions graphically; deduce roots algebraically and turning points by completing the square	A23 generate terms of a sequence from either a term-to-term or a position-to-term rule
A7 where appropriate, interpret simple expressions as functions with inputs and outputs; interpret the reverse process as the 'inverse function'; interpret the succession of two functions as a 'composite function' (the use of formal function notation is expected)	A12 recognise, sketch and interpret graphs of linear functions, quadratic functions, simple cubic functions, the reciprocal function , exponential function y = k^x for positive values of k, and the trigonometric functions (with arguments in degrees) y = sin x, y = cos x and y = tan x for angles of any size	A24 recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions, Fibonacci type sequences, quadratic sequences, and simple geometric progressions (r is where n is an integer, and r is a rational number > 0 or a surd) and other sequences
		A25 deduce expressions to calculate the nth term of linear and quadratic sequences
Assessment	**External Exams Begin wc 13/5 - Practice Papers throughout half term**	