ICKNIELD HIGH SCHOOL **KEY STAGE 4 CURRICULUM MAP**

'Raising the Achievement of All'

WELL-SEQUENCED **CONTEXUALISED/INCLUSIVE** **AMBITIOUS**

SUBJECT: Maths **Year: 11**

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Foundation **U1-Probability** **U2-Simultaneous Equations** **U3 – Similarity & Congruence** **U4 – Vectors** **U5 – Standard Form** **Higher** **U1-Sketching Graphs Quadratic Inequalities, Iteration** **U2-Area & Volume Scale Factors** **U3-Error Intervals & Upper/Lower bound calculations** **U4-Area under a Graph/Rates of Change** **U5 – Transformations of Graphs** **U6 – Equations of Exponential Graphs**	**Foundation** **U6-Quadratic Equations & Graphs** **U7- Number Review** **U8-Algebra review** **Higher** **U7 – Functions** **U8 – Circle Theorems** **U9 – Equation of a Circle** **U10 - Vectors**	**Foundation** **U9 – Perimeter & Area** **U10-Fractions and Percentages** **U11-Ratio and Proportion** **Higher** **U11-Data Review** **U12-Quadratic Equations** **U13-Graphs of Parallel & Perpendicular Lines Percentages** **U14- Sectors of a Circle, Volume & Surface Area of Prisms & 3D Shapes**	**Foundation** **U12 – Volume & Surface Area of 3D Shapes** **U13 – Sequences** **U14 – Linear Graphs** **U15 – Transformations** **U16 – Averages** **Higher** **U15-Transformations** **U16- Multiplicative Reasoning** **U17- Trigonometric Rules** **U18 – Histograms, Boxplots, Cumulative Frequency Graphs** **U19-Direct & Inverse Proportion**	**All Groups will be revising using RAG sheets and addressing the areas of weakness**	**All Groups will be revising using RAG sheets and addressing the areas of weakness**
Content: 'Know what'	**Foundation** U1 -Use probability scales - calculate probability - complete probability tree diagrams/sample space diagrams - calculate probability from tree diagrams U2 – solve simultaneous equations by eliminating variables - Solve simultaneous equations graphically U3 - Identify congruent shapes -Understand congruency conditions -calculate lengths of missing sides in a 2D shapes when the shapes are similar U4 - Draw a column vector - Add & Subtract Column Vectors	**Foundation** U6 -Expand double brackets -Factorise quadratic expressions -Solve Quadratic Equations -Draw Quadratic graphs from a table of Values -Find the turning point of a Quadratic Graph U7 – BIDMAS -Negative Numbers - LCM/HCF -Prime Factorisation U8 -Collecting like terms -Simplifying expressions -Expanding and factorising single brackets -Solving linear equations **Higher**	**Foundation** U9 - Finding Perimeter and area of 2D shapes -Finding Perimeter and area by counting U10 - Equivalence Fractions -Fraction of an amount - Fraction calculation -Simplifying Fractions -Converting Fractions to percentages - Calculating Percentage of a quantity -Reverse percentage Repeated Percentage U11 -Writing Ratio as a Fraction -Sharing amounts in a given Ratio **Higher** U11 -Frequency polygons -Stratified sampling	**Foundation** U12 – Volume and surface area of prisms Volume and surface area of cones, spheres, pyramids U13 – Term to term rules -Use nth term to generate a sequence -Find the nth term - Identify the difference between an arithmetic, geometric, and Fibonacci sequence U14 – Draw and interpret conversion graphs - Draw and interpret distance-time graphs -Draw linear graphs using a table of values -Identify the equation of a line from the graph **Higher** U15	As directed by outcomes of Trial Exams	As directed by outcomes of Trial Exams

	-Multiply & Divide Column Vectors U5 -Convert between Standard Form and Ordinary Numbers -Perform the 4 Operations using Standard Form with and without a calculator **<u>Higher</u>** U1 - Sketch curved graphs - Sketch quadratic graphs identifying the turning points and intercepts - Understand the roots /solutions of a Graph -Use Iteration to estimate the solution of an Equation -Solve quadratic inequalities -Use iteration to find an estimate to a solution of a graph U2 -Find error intervals of rounded values -Calculate upper lower bounds in contexts U3 -Estimate the area under a graph by splitting into triangles and trapeziums -Estimate the gradient of a tangent to a curve U4 – Translate a graph of y=f(x) +/- a and y=f(x+ /-a) -Reflect a graph of y = -fx and y=f(-x) U5-Find the equation of an exponential graph given two coordinates	U7 – Find the output of a Function given the input -Composite functions -Inverse Functions U8 – Angle at the centre is double the angle of the circumference -Angle in a semicircle is 90 degrees -Angles in the same segment are equal - Opposite angles in a cyclical quadrilateral sum to 180 degrees - Tangent meets the radius at 90 degrees - Alternative segment theorem U9 – Equation of a Circle U10 – Simplify vectors -Use vectors to show that lines are parallel -Use vectors to show three points are on a straight line	-Averages from a table -Capture/recapture -Combined Mean U12 - Solve quadratic equations by factorisation -Solve quadratic equations using the quadratic formula -Solve quadratic equations by completing the square U13-Identify parallel and perpendicular gradients Find the equation of parallel lines -Find the equation of perpendicular lines U14 –Calculate arc lengths and sector area - Calculate the surface area and volume of prisms - Calculate the volume and surface area of spheres, cones, pyramids and a combination of 3D shapes	-Describe and perform a combination of transformations - Describe and perform enlargements with a negative scale factor U16 - Reverse percentages -Compound growth and decay -Compound measures (speed, pressure, density)		
Expertise: 'Know how'	**Foundation** Manipulate algebra Factorise and expand algebraic expressions Simplifying fractions Properties of 2D shapes	**Foundation** Add/Subtract/<Multiply and divide Find Areas of 2d Shapes Know properties of 2D shapes **Higher** Fraction Arithmetic	**Foundation** Cancelling down fractions Find Percentages of amounts Simplifying Ratios Add, subtract, multiply and divide Finding patterns Plot coordinates	**Foundation** Plot coordinates Draw axis Read graphs and tables **Higher** Collect like terms,		

	Higher Plot graphs Angle rules for triangles and Quadrilaterals Drawing graphs Reflections and translations Area of trapeziums Rounding	Rounding decimals and integers Finding missing lengths and angles on a right-angle triangle	Draw axis **Higher** Factorise and expand Cancel Fractions 10/20/25/50/75/100 percent of amounts	Solve linear equations Calculate with negative numbers		
Literacy/ Numeracy/ SMSC/	Higher-To be able to use correct terminology for justification	To describe transformation using correct terminology,				
Disciplinary Literacy	Keywords- Centre, circumference, subtended, scalar, Terms, expand, Factorise, quadratic, Linear, rearrange, Elimination, Direct and inverse, Cubic, Reciprocal, Rates of change	Keywords Multiple, Factor, Index, Power, square, Cube, Prism, Cuboids, Cube, Cylinder, Trapezium, Parallelogram, Sine, Cosine, Tangent, Hypotenuse, Adjacent, opposite, Probability,	Keywords Equivalent, Simplify, Ratio, perimeter, Area, perpendicular Height, nth term, common difference, zero term, Compound, Simple Interest, Multiplier, proportion	Keywords- Gradient, y-intercept, steepness, plot, mean, median, mode, range, Reflection, Mirror line, Rotation, clockwise, anti clockwise, centre of rotation, enlargement, scale factor, centre of enlargement, Translation, vector, polygon, corresponding, alternate, vertical opposite, co interior. Prisms, cones, sphere, hemisphere, frustum, Parallel lines, perpendicular lines		
Careers	PROBABILITY real life applications: Predicting outcomes, assessing risk, making decisions from uncertain information leading to the following careers: Data scientist, doctor, insurance analyst, meteorologist, sports analyst, financial analyst, game designer VECTORS real life applications: Representing direction and magnitude of forces, movement and navigation leading to the following careers: Engineer, architect, pilot, game developer, physicist, surveyor, robotics engineer AREA & VOLUME SCALE FACTORS real life applications: Estimating paint needed for houses, scaling 3D-printed models, designing water tanks, calculating packaging sizes, construction planning, medical imaging leading to	ALGEBRA real life applications: creating formulae, predicting costs, programming algorithms, modelling populations or profits) leading to following careers: Engineer, software developer, data analyst, economist, accountant, scientist FUNCTIONS real life applications: Predicting profits, population growth, weather forecasting, machine learning, converting temperatures, modelling fuel consumption can lead to the following careers: Data scientist, software engineer, economist, actuary, AI engineer, financial analyst, pharmacist. CIRCLE THEOREMS real life applications: Designing roundabouts, bridges, gears, wheels, arches, satellite dishes, sports stadiums,	PERIMETER real life applications: Calculate the boundaries of buildings and rooms, design roads, pavements and public spaces, measure materials required for construction, can lead to the following careers: Architect, civil engineer, builder. RATIO & PROPORTION real life application: Scaling recipes, mixing paint or concrete, medication dosages, map reading, fuel mixtures, currency exchange, financial budgeting leading to the following careers: Chef, Pharmacist, Nurse, Architect, Engineer, Financial Adviser, Builder, Fashion Designer PERCENTAGES real life applications: Calculating discounts, VAT, profit margins, pay rises, interest rates, medication concentrations, survey results and business performance	SEQUENCES real life applications: Writing algorithms, predicting patterns, forecasting investments, coding repetitive processes, modelling population growth and machine learning leading to the following careers: Computer programmer, financial analyst, engineer, musician, cryptographer, AI developer AVERAGES real life applications: Analysing performance, exam results, customer satisfaction, patient recovery, business trends leading to the following careers: Sports analyst, market researcher, teacher, healthcare professional, business manager TRANSFORMATIONS real life applications: Rotating machine parts, reflecting designs for symmetry, scaling drawings, moving objects in computer graphics, creating maps and blueprints leading to the		

	the following careers: Architect, Construction Manager, Surveyor, Industrial Designer, Mechanical Engineer, 3D Modeller EXPONENTIAL GRAPHS real life examples: Modelling rapid growth or decay such as populations, investments, disease spread or radioactive decay leading to the following careers: Epidemiologist, economist, environmental scientist, microbiologist, financial adviser, population ecologist	computer graphics, can lead to the following careers: Civil engineer, architect, surveyor, mechanical engineer, graphic designer, game developer VECTORS real life applications: GPS navigation, aircraft flight paths, forces in physics, animation, self-driving cars, drones, robot movement can lead to the following careers: Aerospace engineer, pilot, physicist, game developer, robotics engineer, GPS engineer, military analyst	leading to the following careers: Accountant, retail manager, financial adviser, nurse, pharmacist, data analyst, marketer. QUADRATIC EQUATIONS real life applications: Modelling projectile motion, bridge design, vehicle suspension, animation, satellite trajectories and optimisation problems leading to the following careers: Mechanical engineer, aerospace engineer, game developer, physicist, architect, computer graphics programmer VOLUME & SURFACE AREA real life applications: Estimating materials, designing packaging, calculating paint needed, determining storage capacity, mixing concrete, designing containers leading to the following careers: Civil engineer, packaging designer, architect, construction manager, chef, warehouse manager, product designer	following careers: Architect, graphic designer, CAD technician, game developer, engineer, surveyor, animator HISTOGRAM/ CUMULATIVE FREQUNCY real life applications: Analysing large datasets, identifying trends, measuring performance, monitoring product quality, interpreting experimental results and understanding distributions leading to following careers: Statistician, medical researcher, quality assurance inspector, psychologist, sports scientist, manufacturing engineer		