**ICKNIELD HIGH SCHOOL** **KEY STAGE 3 CURRICULUM MAP**

**'Raising the Achievement of All'**

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

**SUBJECT: Maths** **Year: 8**

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
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| | **U1- Sequences**<br>**U2- Forming and Solving Equations**<br>**U3- Forming and Solving inequality** | **Unit 4-Linear Graphs**<br>**Unit 5 -Accuracy and Estimates**<br>**Unit 6- Ratio Review** | **Unit 7-Real Life Graphs**<br>**Unit 8- Direct and Inverse Proportion** | **Unit 9- Univariate Data**<br>**Unit 10- Bivariate Data** | **Unit 11- Angles in a Polygon**<br>**Unit 12- Bearings**<br>**Unit 13- Circles** | **Unit 14- Volumes and Surfaces areas of Prism** |
| **Key Questions** | U1- Can you see a pattern with the numbers. How would you describe the pattern? What's can be the next term in the pattern? Why? Are there any other possibilities?<br>U2/U3- How can you write that Algebraically | Unit 4- Why does the line go up? Down? What measures the steepness of the curve?<br>Unit 5- Does the estimate seem reasonable? sensible?<br>Unit 6-Ratio Review | Unit 7- What does the steepness of the graph represent? What would the graph of the journey look like?<br>Unit 8-What is the scale Factor? What does it represent? How will the inverse situation affect the scalar? | Unit 9- What's the relationship between the 2 sets of data? Can you make a prediction?<br><br>Unit 10- Bivariate data | Unit 11-Do the shapes Tesselate? How do you know? Is the shape regular? How many sides will the shape have?<br>Unit 13- What's the Area and circumference of the circle? What's the perimeter of a semi-circle or part of a circle | Unit 14- What's the volume and Surface area of Prisms? Is there enough liquid to fill a container? How long will it take to fill a prism shaped container |
| Content: 'Know what' | U1- Recognise number patterns<br>-Understand the nth term is the position to term rule<br>Understand the common difference is added n time to the zero term<br>-Be able to identify the zero term and common difference<br>Be able to find the nth term of an increasing and decreasing sequence<br>- *Be able to* recognize if a sequence is arithmetic or not from the $n^{th}$ term<br>U2-*Understand* equating algebraic expressions<br>*Be able to* equate two expressions to form and solve a linear equation<br>*Be able to* use bar models to support balancing methods of solution for linear equations with unknows on both sides | U4-Understand a graph represents a relationship between the ordinates<br>Be able to generate coordinates from a description of a relationship between the ordinates<br>Be able to draw a line graph from a set of generated coordinates<br>Experience connecting verbal and graphical descriptions of linear relationships<br>Be able to identify a linear relationship from a graphical representation<br>Experience comparing linear and non-linear graphs<br>Experience spotting patterns in coordinates of linear-graphs<br>Understand in a linear relationship, as one variable increases the other | U7- Understand linear relationships as expressions of rate<br>Be able to represent linear relationships graphically<br>Be able to interpret graphical representations of linear relationships<br>Experience visualising different linear relationships<br>Experience comparing graphical representations of linear relationships<br>Understand piecewise relationships as expressions of changing rate<br>Be able to represent piecewise relationships graphically<br>Be able to interpret $x$- and $y$-intercepts on graphical representations of piecewise relationships | U9/10-14: Data Pie Charts and scatter graphs<br><br>Understand that data sets can have more than one variable<br>Understand bivariate means two sets of data<br>Be able to interpret bivariate data sets from tables<br>Understand bivariate data can be represented in a scatter diagram<br>Understand each point on the scatter diagram shows how a single object is measured according to two variables<br>Understand scatter graphs can only represent quantitative bivariate data<br>Be able to interpret data represented in a scatter chart<br>Be able to plot data in a scatter chart | U11-Be able to identify examples of polygons<br>Be able to use basic terminology related to angles and polygons<br>Experience comparing and sorting different polygons<br>Be able to recall key facts from Year 7, such as the sum of interior angles in a triangle<br>Understand what is, and isn't, an 'interior angle'<br>Experience connecting geometric problems and bar models<br>Be able to identify interior angles of a triangle<br>Experience reasoning within geometry to form equations<br>Experience constructing polygons from triangles<br>Experience pattern-spotting and conjecturing<br>U13 | U14-Experience visualising 3-D shapes from 2-D representations.<br>Be able to identify faces, edges and vertices from a 2-D representation of a 3-D shape.<br>Experience justifying, explaining and reasoning.<br>Experience using vocabulary including face, edge, vertex/vertices.<br>Understand a net is a 3-D shape opened out flat.<br>Experience visualising cubes being created from nets.<br>Experience justifying, explaining and reasoning.<br>Experience using vocabulary including face, edge, vertex/vertices, net, opposite.<br>Understand 3-D means three-dimensions. |

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| | *Experience* representing perimeter algebraically<br>*Experience* reasoning algebraically in a geometric context<br>*Understand* equating algebraic expressions<br>*Be able to* equate two expressions to form and solve a linear equation<br>*Be able to* form and solve linear equations involving unknows on both sides with negative coefficients<br>*Experience* manipulating equations<br>U3-Understand inequalities as representations of relationships from contexts<br>Be able to form inequalities to express relationships in perimeter<br>Experience forming inequalities from given contexts<br>Be able to form and solve inequalities from a context<br>Be able to represent and solve inequalities pictorially<br>Understand bar modelling as a representation of solving inequalities<br>Experience identifying and representing inequalities from a context<br>Be able to identify inequalities from pictorial representations<br>Be able to derive inequality relationships from given inequalities<br>Experience modifying and comparing inequalities<br>Experience manipulating inequalities through scaling and translation | increases/decreases at a constant rate<br>Be able to identify the gradient of a graph by looking at its coordinates<br>Experience connecting the coefficient of x to the gradient<br>Understand a line graph has a unique equation which describes it<br>Be able to determine whether a pair of coordinates satisfy a linear equation<br>Be able to identify the gradient of a graph from its graph<br><br>U5-Understand that after the first significant figure all figures are significant<br>Understand the 1st significant figure could be in any place value column<br>Be able to identify the 1st, 2nd, 3rd (etc.) significant figure<br>Experience using language including number, digit, value, figure, significant<br>Be able to round to a given number of significant figures<br>Be able to find a range of possible values a number may have been before it was rounded, using a number line<br>Experience working with very small numbers<br>Experience comparing methods of estimation<br>Experience checking answers by comparing them to estimates<br>Experience using a calculator with multi-step decimal questions<br>Be able to move between different methods of rounding ('to the nearest', to decimal places and to significant figures) | Experience visualising and comparing changing rate in a context<br>Understand piecewise relationships as expressions of changing rate<br>Be able to represent piecewise linear relationships graphically<br>Be able to interpret and calculate positive, negative and zero gradient as rate in a context<br>Experience visualising and comparing changing rate qualitatively and quantitatively<br>Understand curved graphs as constantly changing rate<br>Be able to use sketched graphs to express and interpret qualitative changes in rate<br>Experience drawing and explaining changing rate given a context<br>Experience comparing rate using sketched graphs<br><br>U8- Be able to use the 'unitary method' to scale directly proportional values with non-integer scale factors and constants of proportionality<br>Understand how the non-integer scale factors and constants of proportionality can be expressed as a single fraction discovered from the 'unitary method'<br>Experience pattern spotting within the 'unitary method' and scale factors and constants of proportionality<br>Experience comparing abstract representations of scale factors and constants of proportionality | Understand correlation means how two sets of data relate<br>Be able to recognise correlation on a scatter chart<br>Be able to describe general trends in a bivariate data set from a scatter graph representation<br>Experience describing relationships in bivariate data<br>Understand the line of best fit minimises the distance between it and the plotted points<br>Understand the line of best fit does not necessarily pass through the origin<br>Be able to draw a line of best fit<br>Be able to connect the line of best fit to correlation<br>Experience defining concepts through examples and non-examples | Understand the anatomy of a circle.<br>Be able to identify and use features of a circle.<br>Be able to use circle properties to form shapes.<br>Experience reasoning geometrically.<br>Understand that circle properties can be used to construct polygons.<br>Be able to use circle properties to construct shapes.<br>Be able to identify shape properties based on circle constructions.<br>Experience creating constructions.<br>Experience reasoning with circle geometry.<br>Understand Pi as the ratio between diameter and circumference.<br>Be able to calculate the circumference of a circle.<br>Be able to calculate the arc length of a semi-circle.<br>Be able to calculate perimeters involving arc lengths.<br>Experience pattern-spotting between diameter and circumference lengths.<br>Experience identifying features within complex shapes.<br>Experience organising shapes by compound elements.<br>Understand compound shapes as comprising simpler known shapes.<br>Be able to solve perimeter problems involving compound shapes and arc lengths. | Be able to identify the dimensions of a cuboid from a 2-D representation or net.<br>Experience visualising cuboids being created from nets.<br>Be able to construct nets of cuboids.<br>Experience using vocabulary including face, edge, vertex/vertices, net, dimensions.<br>Understand the surface area of a 3-D shape is the sum of the area of its faces.<br>Understand the surface area of a 3-D shape is the area of its net.<br>Be able to calculate the surface area of a cuboid.<br>Experience connecting face area, surface area and dimensions.<br>Experience working systematically to solve problems involving dimensions, face area and surface area. |

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| | | Experience using estimation to solve real-life problems<br>Experience drawing connections between the concepts covered in this Unit<br>Experience solving contextual problems involving area | Be able to express scale factors and constants of proportionality efficiently including using reciprocals to reverse the process<br>Experience generating values in inversely proportional relationships<br>Understand that pairs of values in inversely proportional relationships have a common product<br>Experience further real-life examples of inversely proportional relationships<br>Understand the term 'inverse proportion'<br>Understand the properties of scale factors and constants of proportionality in inversely proportional relationships. | | | |
| Expertise: 'Know how' | U1-Know how to find the nth term,<br>-Know how to create a sequence given an nth term<br>U2/3- To know how to collect like terms and simplify expressions<br>To be confident with inverse operations.<br>Rounding to whole numbers and 1 or 2 decimal places. Be proficient in their times tables | U4-Plot coordinates in all 4 quadrants<br>-label axis,<br>U5-positions of place value<br>-To be confident in rounding integers 10s, 100s, 1000s<br>U6- To be able to divide integers into whole numbers or decimals.<br>-To be able to multiply integers | U7-Plot coordinates<br>-Draw Graphs<br>U8- To be able to divide integers into whole numbers or decimals.<br>-To be able to multiply integers<br>U9 | U9/U10- Plot data<br>-Calculate averages<br><br>U10- Angles in circle add up to 180 degrees.<br>-parts of a circle<br>- | U11- substitute in to formulas?<br>-angles around a point add upto 360 degrees<br>-Angles on a straight line add upto 180 degrees<br>-Names of 2 D shapes and properties<br><br>U12- know how to use a Protractor<br>-Measure lengths<br>-convert lengths | U14- Names of 3Ds shapes<br>-Multiplying<br>-conversion of lengths<br>-Area of 2D shapes (Triangle, Square, Rectangle, Trapezium, Parallelogram, |
| Literacy/ Numeracy/ SMSC/ | U1- What do you notice about the number pattern. What's the next term in the sequence? Why?<br>U2/U3-Whats the same? What's the difference | U4-Whats the relationship between the x-coordinate and y-coordinate<br>U5-Does the answer seem reasonable<br>U6-Whats the proportion of each part of the ratio | U7-What do you notice? What does a horizontal line on the graph mean with regards to the rate of change? What does a steep line mean regarding rate of Change?<br>U8 | U9/10- How do you describe the relationship. Is there a relationship between the 2 sets of the data | U11-do the shapes tesselate? What's the relationship between interior and exterior angles? Is the shape regular? How many sides does the shape have?<br><br>U12- How far? What's the bearing? | U14- Examples of Prisms in the real world, container filling problems. How many boxes of particular dimensions fit in a bigger container |
| Disciplinary Literacy | Keywords-<br>U1- Arithmetic, Geometric, nth Term, zero term, Term, position | Keywords-<br>U4-Gradient, y-intercept, negative, positive, x- coordinate, | Keywords<br>U7-Gradient, Rate of change, steepness | Keywords- | Keywords- | Keywords-<br>U14 Vertices, faces, edge, prism, cross section, cylinder, triangular |

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| | U2/U3-Expression, Equation, balance, inverse, operation, Unknown, Coefficient | y-coordinate, relationship, coordinates<br>U5-significant figures, decimal places, accuracy, estimate<br>U6-Proportion | U8-Direct proportion, Inverse Proportion | U9 Correlation, trend, positive, negative, mean, median, mode and range<br><br>U10-Angles, degrees | U11 Interior angle, Exterior angles, polygon, regular, irregular, tessellate<br><br>U12-Equidistant, Bearing, scale | prism, cuboid, Cube, Trapeziumoid |
| Careers Links | Develops logical thinking and problem-solving used by **software developers, engineers, economists, data analysts, accountants, and scientists**. Understanding patterns and algebra is fundamental in coding, financial modelling, and engineering design. | Supports careers involving measurement, planning and modelling, including **architects, surveyors, construction managers, pharmacists, chefs, and manufacturing engineers**. Graphs and ratios are essential for interpreting data and making accurate calculations. | Relevant to **environmental scientists, economists, healthcare professionals, engineers, logistics planners, and business analysts**. Students learn to interpret changing relationships and model real-life situations. | Introduces statistical skills used by **data scientists, market researchers, psychologists, sports analysts, epidemiologists, and quality assurance professionals**. Learners explore data collection, analysis and identifying trends. | Supports careers in **architecture, civil engineering, aviation, surveying, navigation, graphic design, and construction**. Geometry underpins design, mapping, navigation and structural planning. | Applies to **product designers, engineers, architects, builders, packaging designers, plumbers, and manufacturing technicians**. Understanding volume and surface area is essential when designing, constructing and manufacturing real-world objects. |