| Subject | Maths | Year Group | 8 |  |  |  |
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|  | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Scheme title | Sequences, equations \& inequalities | Graphical representations | Proportional reasoning | Representations \& reasoning with data | Geometrical reasoning | Area, volume \& surface area |
| Purpose of scheme | To experience using algebraic expressions and equations to make generalised statements. Pupils are introduced to linear sequences through number grids. Pupils will then have an opportunity to explore the different features of expressions, equations \& inequalities and develop fluency in manipulating with them. | Pupils will draw upon their previous experience of the Cartesian Plane and then use this to focus on connecting relationships between coordinates to the graphs of linear relationships. Pupils will then examine time considering accuracy and the purpose and procedure of rounding numbers. | Before beginning work on real life graphs, pupils will revisit ratio from Year 7. <br> Pupils will then connect prior learning of linearity and gradient to rates in real life contexts represented graphically. | Pupils are introduced to the fundamentals of data collection, analysis and representation. Pupils will then look at what bivariate data is and how it can be represented. | Pupils will explore angles formed at intersections between a transversal and a pair of parallel lines. Pupils will also investigate compounded triangles in order to find methods to calculate interior and exterior angles of polygons. Some of this knowledge will be applied when pupils are introduced to the concept of Bearings. | To investigate the connection between the circumference and diameter of a circle to derive Pi. This will be extended to explore the connection between Pi, the radius and the area of a circle. Pupils will then explore the terminology and properties of 3D shapes before developing strategies to calculate volume and surface area. |
| Knowledge in sequence | - Sequences <br> - Forming \& solving equations <br> - Forming \& solving inequalities | - Coordinates \& Linear Graphs <br> - Accuracy \& Estimation | - Ratio review <br> - Real-Life Graphs \& Rates <br> of Change <br> - Direct \& Inverse Proportion | - Univariate Data <br> - Bivariate Data | - Angles in Parallel Lines <br> - Angles in Polygons <br> - Bearings | - Circles <br> - Volume \& Surface Area of Prisms |
| Skills | - Investigate patterns of multiples in grids <br> - Use tracking calculations to generate sequences <br> - Find the position to term rule of a linear sequence <br> - Use the position to term rule to solve problems <br> - Recap work in Year 7 on expressions <br> - Substitute into linear equations <br> - Solve linear equations using bar models <br> - Form and solve linear equations with context <br> - Use the inequality symbols <br> - Represent an inequality on a number line <br> - Form and solve linear inequalities | - Plot and read coordinates - Identify and plot equations of horizontal and vertical lines - Generate coordinates from equations <br> - Plot linear graphs given an equation <br> - Find the gradient of a line <br> - Recognise the gradient and y-intercept from a graph <br> - Round an integer to the nearest 10,100 or 1000 <br> - Round to a specified number of decimal places <br> - Round to a specified number of significant figures - Find a range of possible values a number may have been before it was rounded | - Recap Year 7 ratio skills <br> - Express parts of a ratio as <br> a fraction <br> - Represent linear relationships graphically as expressions of rate <br> - Understand speed as a rate of change <br> - Draw and interpret distance time graphs <br> - Interpret piecewise graphs <br> - Sketch real-life graphs <br> - Calculate constants of proportionality <br> - Recognise direct proportionality on the Cartesian plane <br> - Use the unitary method to scale directly proportional relationships <br> - Interpret and solve problems with inversely proportional relationships | - Recognise different types of data <br> - Record and tabulate data <br> - Represent data as a bar chart <br> - Represent data as a pie chart - Understand and be able to calculate averages and the range <br> - Solve problems involving averages <br> - Plot data in a scatter graph <br> - Understand and interpret correlation <br> - Describe general trends in bivariate data | - Understand that the intersection between a transversal and a pair of parallel lines creates equivalent angles <br> - Identify vertically opposite angles <br> - Identify alternate, corresponding and allied angles and solve problems involving these <br> - Solve geometrical problems <br> - Identify examples of polygons <br> - Use terminology related to angles and polygons <br> - Know the sum of the angles in a triangle is 180 degrees - Use the number of internal triangles of a polygon to determine the angle sum of any polygon <br> - Understand the sum of the exterior angles of a polygon is 360 degrees <br> - Understand that bearings describe a direction and use correct bearing notation | - Label the features of a circle <br> - Understand sectors as a <br> fraction of a circle <br> - Understand pi as the result of dividing the circumference of a circle by its diameter <br> - Calculate the area and circumference of a circle <br> - Calculate arc lengths and areas of sectors <br> - Identify properties of 3D <br> shapes <br> - Draw nets for cubes and cuboids <br> - Calculate the surface area of a cuboid <br> - Understand what a prism is - Understand the concept of volume and be able to calculate the volume of cubes, cuboids and prisms <br> - Calculate the surface area of prisms and cylinders |
| Key words | Sequence, linear, arithmetic sequence term, variable, multiple, position, rule, expression, substitute, solve, equation, inequality, balance, represent, ascending, descending, equivalent, identity, expand, factorised form | Plot, Cartesian, plan, axis, axes, coordinate, linear, graph, midpoint, gradient, intercept, horizontal, vertical, function, equation, round, accuracy, significant, estimate, origin | Ratio, proportion, share, constant of proportionality, rate, equivalent, simplify, gradient piecewise, unitary, scale, direct, inverse, multiplier | Univariate, primary, secondary, qualitative, quantitative, continuous, discrete, tabulate, proportion, average, mean, median, mode, range, outlier, correlation, causation, bivariate, extrapolation, variable | Angle, parallel, intersect, transversal, region, vertically opposite, corresponding, alternate, allied, co-interior, polygon, interior, exterior, vertex, bearing | Area, circumference, radius, diameter, chord, arc, sector, segment, Pi, property, surface, face, edge, vertices, net, prism, volume, cross-section, dimension, unit |
| End point | Pupils will have experienced making generalisations about the position to term rule of a sequence. They will also be able to identify and find solutions to equations and inequalities and be able to represent these using bar models. | Pupils will be able to solve problems on a Cartesian Plane and make links to the equation of a line. Pupils will also be proficient rounding to differing degrees of accuracy and some may be able to solve problems involving bounds. | Pupils will be able to make links between ratio and proportion in real life contexts and with graphical representations. They will be able to connect the concept of gradient to rate of change. Pupils will have had an opportunity to revisit the language of scale factor and constant of proportionality in greater depth. | Pupils will have an understanding of how to collect, analyse and represent both univariate and bivariate data. They should be fluent in constructing technical diagrams including pie charts, pictograms, bar charts and scatter graphs. | Pupils will be able to use angle theorems to calculate missing angles in geometrical figures including angles within polygons and within a pair of parallel lines. They should be able to use the correct terminology to be able to reason geometrically. | Pupils will be able to use the appropriate formulae to solve problems involving area and perimeter of 2D figures and volume and surface area of 3D figures. |
| Assessment Methods | Termly assessment to | ake place in Autumn 2 | Termly assessment to | to take place in Spring 2 | Termly assessment to | take place in Summer 2 |

