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| | Stage 10F | |
| | Topics | |
| Half Term 1 | Angles | 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 symmetry 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 |
| | Scale Diagrams and Bearings | Use scale factors, scale diagrams and maps Measure line segments and angles in geometric figures, including interpreting maps and scale drawings and use of bearings; including the eight compass point bearings and three-figure bearings. |
| | Revise Basic Number | Order positive and negative integers, decimals and fractions apply the four operations, including formal written methods, to integers, decimals and simple fractions (proper and improper), and mixed numbers – all both positive and negative understand and use place value (eg when working with very large or very small numbers) questions set in context: for example profit, loss, cost price, selling price, debit, credit, balance, income tax, VAT and interest rate. Use conventional notation for priority of operations, including brackets, powers, roots and reciprocals Use the concepts of prime numbers, factors (divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple Prime factor decomposition including product of prime factors written in index form. Estimate answers: check calculations using approximation and estimation Apply systematic listing strategies |
| | Statistics F1 | Frequency Tables Bar Charts Pie Charts Pictograms Vertical Line Charts for ungrouped discrete numerical data Histograms (constant bar width) Line graphs / tables for Time Series data (but not Moving Trend) Analyse and compare 2 data sets |
| | Statistics F2 | Understand the limitations of sampling Apply statistics to describe a population Understand the terms: primary data, secondary data, discrete data and continuous data. Be able to calculate all measures of central tendency (Mean, Median, Mode) and spread (range, including consideration of outliers) Be able to calculate Mean, Median and Mode from a table Know the meaning of the lower quartile and upper quartile Find the quartiles for discrete data sets Calculate and interpret the interquartile range Be able to compare two data sets and draw conclusions Write a basic Questionnaire |
| | Fractions and Decimals | Revisit Topic 1 This Term : Order positive and negative integers, decimals and fractions apply the four operations, including formal written methods, to integers, decimals and simple fractions (proper and improper), and mixed numbers – all both positive and negative understand and use place value (eg when working with decimals) Calculate exactly with Fractions Work interchangeably with terminating decimals and their corresponding fractions |
| | Angles | 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 symmetry 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 |
| Scale Diagrams and Bearings | Use scale factors, scale diagrams and maps Measure line segments and angles in geometric figures, including interpreting maps and scale drawings and use of bearings; including the eight compass point bearings and three-figure bearings. | |
| Standard Form 1 | Write and interpret large and small numbers in Standard Form Add (subtract) numbers written in standard form Multiply (divide) numbers written in standard form Convert a 'near miss' into standard form; e.g. 23×10^7 Enter a calculation written in standard form into a scientific calculator Interpret the standard form display of a scientific calculator | |

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| Half term 2 | Sequences 1 | <p>Generate terms of a sequence from either a term-to-term or a position-to-term rule (including patterns and diagrams)</p> <p>Recognise and use sequences of triangular, square and cube numbers and simple arithmetic progressions</p> <p>Recognise Fibonacci numbers</p> <p>Recognise the Fibonacci sequence</p> <p>Generate Fibonacci type sequences</p> <p>Generate a Geometric sequence</p> <p>Given a geometric sequence, find it formula</p> <p>Deduce expressions to calculate the nth term of linear sequences</p> |
| | Constructions | <p>Perpendicular bisector of a line</p> <p>Construct a Perpendicular thru a point on the line</p> <p>Construct a Perpendicular thru a point not on the line</p> <p>Bisect an angle</p> <p>Construct SSS triangle (include constructing an angle of 60°)</p> <p>Construct SAS and ASA triangles using rule and protractor</p> <p>Construct RHS triangles using ruler and compasses</p> <p>Know that the perpendicular distance from a point to a line is the shortest distance to the line</p> <p>Draw Loci of a point, 2 points, a line, 2 lines, basic shapes.</p> <p>Use these to construct given figures and solve loci problems</p> |
| | Pythagoras 2 | <p>Know the formulae for: Pythagoras' theorem, $a^2 + b^2 = c^2$</p> <p>Apply them to find lengths in right-angled triangles in two dimensional figures</p> <p>Test if a triangle is right angled</p> |
| | Geometry 1 S7 | <p>Identify and use angles rules (Supplementary, Complementary, Vertically Opposite)</p> <p>Find missing angles in triangles</p> <p>Use knowledge of angles to calculate missing angles in geometrical diagrams</p> <p>Explain reasoning using vocabulary of angles</p> |
| | Trigonometry 1 | <p>Know how to select the correct mode on a scientific calculator</p> <p>Know the trigonometric ratios, $\sin\theta = \text{opp/hyp}$, $\cos\theta = \text{adj/hyp}$, $\tan\theta = \text{opp/adj}$</p> <p>Set up and solve a trigonometric equation to find a missing side in a right-angled triangle</p> <p>Set up and solve a trigonometric equation when the unknown is in the denominator of a fraction</p> <p>Set up and solve a trigonometric equation to find a missing angle in a right-angled triangle</p> <p>Use trigonometry to solve problems involving bearings</p> <p>Use trigonometry to solve problems involving an angle of depression or an angle of elevation</p> |
| | Fractions GCSE | CONTINUING FROM HALF TERM 1 |
| | Revise Basic Number | CONTINUING FROM HALF TERM 1 |
| Half Term 3 | Area and Volume | <p>Identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and spheres</p> <p>Calculate perimeters of 2D shapes, including composite shapes</p> <p>Areas of 2D shapes including composite shapes</p> <p>Know and apply formulae to calculate: area of triangles, parallelograms, trapezia;</p> <p>volume of cuboids and other right prisms (including cylinders)</p> |
| | Circumference and Area | <p>Know the parts of a circle.</p> <p>Area of a circle</p> <p>Circumference of a Circle</p> <p>Area and Perimeter of Semi circles, Quadrants and composite shapes</p> <p>Calculate with multiples of Pi (N8)</p> <p>Areas and perimeters of Sectors of Circles (G18)</p> <p>Surface area and Volumes of spheres, cones and composite solids.</p> |
| | Statistics F1 | CONTINUING FROM HALF TERM 1 |
| | Statistics F2 | CONTINUING FROM HALF TERM 1 |
| | Coordinates and Graphs 1 | <p>Use the form $y = mx + c$ to identify parallel lines</p> <p>Rearrange an equation into the form $y = mx + c$</p> <p>Find the equation of a line through one point with a given gradient</p> <p>Find the equation of a line through two given points</p> <p>Interpret the gradient of a straight line graph as a rate of change</p> <p>Plot graphs of quadratic (cubic, reciprocal) functions</p> <p>Recognise and interpret the graphs of quadratic (cubic, reciprocal) functions</p> <p>Sketch graphs of quadratic (cubic, reciprocal) functions</p> <p>Plot and interpret graphs of non-standard functions in real contexts</p> <p>Find approximate solutions to kinematic problems involving distance, speed and acceleration</p> |

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| Half Term 4 | Coordinates and Graphs 1 | CONTINUING FROM HALF TERM 1 |
| | Properties of Polygons and Circles | Use the fact that angles in a triangle total 180° to work out the total of the angles in any polygon Establish the size of an interior angle in a regular polygon Know the total of the exterior angles in any polygon Establish the size of an exterior angle in a regular polygon |
| | Transformations | All 2D transformations on a Cartesian grid; - Translation (with Vector notation) - Reflection (in a known vertical or horizontal line) - Rotation about a given centre - Enlargement from a centre (given as coordinates) - Fractional Enlargement Need to be able to find the centre of rotation (and direction) using perpendicular bisectors. Know that the image of an enlargement of a shape is Similar to the object. Know that the object and image of a relection, rotation or translation are Congruent |
| | Review Basic Probability | Record, describe and analyse the frequency of outcomes of probability experiments using tables and frequency trees Know that probabilities should be written as fractions, decimals or percentages. Apply the property that the probabilities of an exhaustive set of outcomes sum to 1 Apply the property that the probabilities of an exhaustive set of mutually exclusive events sum to 1 Record systematically outcomes of 2 mutually exc events; - Lists - Possibility Space Diagrams Compare theoretical and experimental probabilities |
| HALF TERM 5 | Measures | Calculate speed from distance and time. Appreciate units of; - Speed - Distance - Time Calculate; - Density - Pressure - Population Density |
| | Probability | Apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple experiments Using appropriate language and the 0 to 1 probability scale Relate relative expected frequencies to theoretical probability Enumerate sets and combinations of sets systematically, using tables, grids, Venn diagrams Calculate the probability of independent and dependent combined events, including using tree Diagrams and other representations, and know the underlying assumptions Understand that empirical unbiased samples tend towards theoretical probability distributions, with increasing sample size |
| | Coordinates and Graphs | Plot use and interpret - Conversion graphs - Distance time graphs - Speed (velocity) time graphs Interpret the gradient of a straight line graph as a rate of change Plot graphs of quadratic (cubic, reciprocal) functions Recognise and interpret the graphs of quadratic (cubic, reciprocal) functions Sketch graphs of quadratic (cubic, reciprocal) functions Plot and interpret graphs of non-standard functions in real contexts Find approximate solutions to kinematic problems involving distance, speed and acceleration |
| | Coordinates and Graphs | CONTINUING FROM HALF TERM 5 |
| | Shape | Know the vocabulary of 3D shapes Know the connection between faces, edges and vertices in 3D shapes Visualise a 3D shape from its net Recall the names and shapes of special triangles and quadrilaterals Know the meaning of a diagonal of a polygon Know the properties of the special quadrilaterals (including diagonals) Apply the properties of triangles to solve problems Apply the properties of quadrilaterals to solve problems Construct plans and elevations of 3D shapes. Interpret Plans and elevations of 3D shapes. |

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| Half Term 6 | | <p>Be able to draw Nets of 3D shapes</p> <p>Be able to find the surface area of a 3D shape from its net.</p> <p>Know the connection between faces, edges and vertices in 3D shapes*</p> |
| | Ratio and Proportion | <p>Identify and work with fractions in ratio problems</p> <p>Express one quantity as a fraction of another, where the fraction is less than 1 or greater than 1</p> <p>Use ratio notation, including reduction to simplest form</p> <p>Divide a given quantity into two parts in a given part : part or part : whole ratio</p> <p>Express the division of a quantity into two parts as a ratio</p> <p>Apply ratio to real contexts and problems (such as those involving conversion, comparison, scaling, mixing, concentrations)</p> <p>Including better value or best-buy problems</p> <p>Express a multiplicative relationship between two quantities as a ratio or a fraction</p> <p>Understand and use proportion as equality of ratios</p> <p>Relate ratios to fractions and to linear functions</p> |
| | Constructions | <p>Use the standard ruler and compass constructions</p> <p>Perpendicular bisector of a line segment</p> <p>Constructing a perpendicular to a given line from/at a given point</p> <p>Bisecting a given angle</p> <p>Use these to construct given figures and solve loci problems</p> <p>Know that the perpendicular distance from a point to a line is the shortest distance to the line</p> <p>Including constructing an angle of 60°.</p> |