**Curriculum Overview for Mathematics**

**Year 10**

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| **Half Term 1: Angles, bearings and scale diagrams**  **Declarative Knowledge:**  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  **Procedural Knowledge:**  Use the Standard conventions for labelling and referring to the sides and angles of triangles  Draw diagrams from written descriptions  Understand and find alternate and corresponding angles on parallel lines  Use scale factors, scale diagrams and maps  **Conditional Knowledge:**  Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles in geometric problems.  Measure line segments and angles in geometric figures, including interpreting maps and scale drawings and use of bearings | Books | Modelling reading of questions by the class teacher – teaching like a Mathematician  Two key words at the start of each lesson defined  Expectation of Mathematical vocabulary used in lessons |
| Speech | Points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons, notation, reflection, line of reflection, order of rotational symmetry. |
| Checklist RTL | There will be a formal end of half-term exam incorporating the 2 units studied during the half-term.  We will re-teach during an Exam Review lesson after the assessment |
| Home | Key Knowledge Organiser test – revise the key knowledge organiser given at the start of the unit  Dr Frost Maths – practising skills using DrFrostMaths.com (a unique username and password will be provided by the school) |
| **Half Term 1: Properties of Polygons**  **Declarative Knowledge:**  Use the terms regular and irregular polygons. Know the sum of angles in a triangle.  **Procedural Knowledge:**  Understand how to draw diagonals of a polygon, by joining vertices.  **Conditional Knowledge:**   * 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) * 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 | Books | Modelling reading of questions by the class teacher – teaching like a Mathematician  Two key words at the start of each lesson defined  Expectation of Mathematical vocabulary used in lessons |
| Speech | Polygon, regular, irregular, vertex, diagonal, triangle, angle sum, interior, exterior, opposite angle, alternate angle, corresponding angle, right angle, acute, obtuse, reflex, degrees, parallel |
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| **Half Term 1: Calculating with percentages**  **Declarative Knowledge:**   * Define percentage as ‘number of parts per hundred’   **Procedural Knowledge:**   * Express one quantity as a percentage of another * Interpret percentages and percentage changes as a fraction or decimal and interpret these multiplicatively * Compare two quantities using percentages * Work with percentages greater than 100%   **Conditional Knowledge:**   * Solve problems involving percentage change, including:   + percentage increase / decrease problems   + original value problems   + simple interest, including in financial mathematics * Interpret fractions and percentages as operators | Books | Modelling reading of questions by the class teacher – teaching like a Mathematician  Two key words at the start of each lesson defined  Expectation of Mathematical vocabulary used in lessons |
| Speech | Fraction, decimal, percentage, percentage change, proportion, increase, decrease, original value, simple interest, compound interest |
| Checklist RTL | There will be a formal end of half-term exam incorporating the 2 units studied during the half-term and will recall work from Half-Term 1  We will re-teach during an Exam Review lesson after the assessment |
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| **Half Term 2: Basic Algebra**  **Declarative Knowledge:**   * Use and interpret algebraic notation, including:   http://aqamaths.aqa.org.uk/custom_content/8300_Foundation_images/Basic_Algebra_A1_images/8300%20Foundation%203y%20in%20place%20of%20y+y+y%20and%203%20x%20y(1).jpg  http://aqamaths.aqa.org.uk/custom_content/8300_Foundation_images/Basic_Algebra_A1_images/8300%20Foundation%20a2%20in%20place%20of%20a%20x%20a.jpg  http://aqamaths.aqa.org.uk/custom_content/8300_Foundation_images/Basic_Algebra_A1_images/8300%20Foundation%20a3%20in%20place%20of%20a%20x%20a%20x%20a.jpg  http://aqamaths.aqa.org.uk/custom_content/8300_Foundation_images/Basic_Algebra_A1_images/8300%20Foundation%20a2b%20in%20place%20of%20a%20x%20a%20x%20b.jpg  http://aqamaths.aqa.org.uk/custom_content/8300_Foundation_images/Basic_Algebra_A1_images/8300%20Foundation%20a%20over%20b%20in%20place%20a%20div%20b.jpg   * coefficients written as fractions rather than as decimals * brackets * Use conventional notation for priority of operations, including brackets, powers, roots and reciprocals   **Procedural Knowledge:**   * understand and use the concepts and vocabulary of expressions, equations, formulae, identities, inequalities, terms and factors * Simplify and manipulate algebraic expressions by:   + collecting like terms   + multiplying a single term over a bracket   + taking out common factors   **Conditional Knowledge:**  Simplify and manipulate algebraic expressions including those involving surds  Identify missing terms or coefficients by manipulating identities | Books | Modelling reading of questions by the class teacher – teaching like a Mathematician  Two key words at the start of each lesson defined  Expectation of Mathematical vocabulary used in lessons |
| Speech | Coefficient, fraction, term, expression, equation, identity, formula, inequality, bracket, factor, common factor, priority of operations, power, root, reciprocal |
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| **Half Term 2: Equations**  **Procedural Knowledge:**   * Substitute numerical values into formulae and expressions, including scientific formulae * Solve linear equations in one unknown algebraically including those with the unknown on both sides of the equation | Books | Modelling reading of questions by the class teacher – teaching like a Mathematician  Two key words at the start of each lesson defined  Expectation of Mathematical vocabulary used in lessons |
| Speech | Formula, expression, equation, unknown, solve, substitute, operation, reverse, solution |
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| **Half Term 2: Sequences**  **Procedural Knowledge:**   * Generate terms of a sequence from either a term-to-term or a position-to-term rule   Recognise and use:   * sequences of triangular, square and cube numbers * simple arithmetic progression * Fibonacci type sequences * quadratic sequences * and simple geometric progressions (`r^n` where `n` is an integer and `r`is a rational number > 0) * Deduce expressions to calculate the nth term of linear sequences   **Conditional Knowledge:**   * Deduce expressions to calculate the nth term **quadratic** sequences | Books | Modelling reading of questions by the class teacher – teaching like a Mathematician  Two key words at the start of each lesson defined  Expectation of Mathematical vocabulary used in lessons |
| Speech | Sequence, term , position, position-to-term rule, term-to-term rule, nth term, linear, arithmetic, quadratic, square, triangular, Fibonacci, geometric, generate |
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| **Half Term 2: Co-ordinates and linear graphs**  **Declarative Knowledge:**   * Work with co-ordinates in all four quadrants   **Procedural Knowledge:**   * Plot graphs of equations that correspond to straight line graphs in the co-ordinate plane * Use the form https://allaboutmaths.aqa.org.uk/custom_content/8300_Foundation_images/coordinates_and_linear_graphs/y=mx+c%202nd.jpg to identify parallel lines **and perpendicular lines**   **Conditional Knowledge:**   * Solve geometrical problems on co-ordinate axes * Find the equation of the line through two given points, or through one point with a given gradient * Identify and interpret gradients and intercepts of linear functions graphically and algebraically | Books | Modelling reading of questions by the class teacher – teaching like a Mathematician  Two key words at the start of each lesson defined  Expectation of Mathematical vocabulary used in lessons |
| Speech | Co-ordinate, line, point, graph, gradient, intercept, plot, linear function, parallel, perpendicular, x-axis, y-axis, equation, coefficient |
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| **Half Term 2: Real Life Graphs**  **Procedural Knowledge:**   * 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   **Conditional Knowledge:**   * Interpret the gradient of a straight-line graph as a rate of change | Books | Modelling reading of questions by the class teacher – teaching like a Mathematician  Two key words at the start of each lesson defined  Expectation of Mathematical vocabulary used in lessons |
| Speech | Speed, distance, time, acceleration, proportional, gradient, equation, coefficient, reciprocal, exponential, kinematic, rate of change |
| Checklist RTL | There will be a formal end of half-term exam incorporating the 2 units studied during the half-term.  We will re-teach during an Exam Review lesson after the assessment |
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