**Curriculum Overview for Mathematics**

**Year 10**

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| **Half Term 1: Angles and Polygons**  **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  Use the terms regular and irregular polygons. Know the sum of angles in a triangle.  **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  Understand how to draw diagonals of a polygon, by joining vertices.  **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  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 | Points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons, notation, reflection, line of reflection, order of rotational symmetry. Polygon, regular, irregular, vertex, diagonal, triangle, angle sum, interior, exterior, opposite angle, alternate angle, corresponding angle, right angle, acute, obtuse, reflex, degrees, parallel |
| Checklist RTL | A formal end of unit exam will take place at the end of the unit. The questions will be taken from the exam board bank of questions.  Reteaching / relearning will be class dependent subject to the performance of the class. |
| Home | Practise Exam Questions based on the current unit or previous units to build recall.  Dr Frost Maths – practising skills using DrFrost.org (a unique username and password will be provided by the school)  We expect Year 10 pupils to spend 1 hour on Maths homework per week (on average over the half-term – this may be higher nearer exams or lower at other times). |
| **Half Term 1: Fractions, Decimals and Percentages**  **Declarative Knowledge:**  Review working with fractions, decimals and percentages  Define percentage as ‘number of parts per hundred’  **Procedural Knowledge:**  Calculate with fractions, decimals and percentages  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 | A formal end of unit exam will take place at the end of the unit. The questions will be taken from the exam board bank of questions.  Reteaching / relearning will be class dependent subject to the performance of the class. |
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| **Half Term 2: Basic Algebra and Sequences**  **Declarative Knowledge:**  Use and interpret algebraic notation, including *y + y + y* and *3 x y* being *3y*  a2 in place of a x a; a3 in place of *a x a x a*  a2b in place of *a x a x b*  in place of *a ÷ b*  coefficients written as fractions rather than as decimals  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  Substitute numerical values into formulae & expressions  Solve linear equations in one unknown algebraically including those with the unknown on both sides of the equation  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:**  Simplify and manipulate algebraic expressions including those involving surds  Identify missing terms or coefficients by manipulating identities  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 | Coefficient, fraction, term, expression, equation, identity, formula, inequality, bracket, factor, common factor, priority of operations, power, root, reciprocal  Formula, expression, equation, unknown, solve, substitute, operation, reverse, solution  Sequence, term , position, position-to-term rule, term-to-term rule, nth term, linear, arithmetic, quadratic, square, triangular, Fibonacci, geometric, generate |
| Checklist RTL | A formal end of unit exam will take place at the end of the unit. The questions will be taken from the exam board bank of questions.  Reteaching / relearning will be class dependent subject to the performance of the class. |
| Home | Practise Exam Questions based on the current unit or previous units to build recall.  Dr Frost Maths – practising skills using DrFrost.org (a unique username and password will be provided by the school)  We expect Year 10 pupils to spend 1 hour on Maths homework per week (on average over the half-term – this may be higher nearer exams or lower at other times). |
| **Half Term 2: Working with 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 *y=mx+c* to identify parallel lines **and perpendicular lines**  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:**  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 & algebraically  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 | Co-ordinate, line, point, graph, gradient, intercept, plot, linear function, parallel, perpendicular, x-axis, y-axis, equation, coefficient  Speed, distance, time, acceleration, proportional, gradient, equation, coefficient, reciprocal, exponential, kinematic, rate of change |
| Checklist RTL | A formal end of unit exam will take place at the end of the unit. The questions will be taken from the exam board bank of questions.  Reteaching / relearning will be class dependent subject to the performance of the class. |
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