**Curriculum Overview for Mathematics**

**Year 9**

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| **Half Term 1: Exploring Graphs**  **Declarative Knowledge:**  Recognise the four quadrants of a co-ordinate grid  Plot point in at least 1 quadrant of a coordinate grid  Plot co-linear points in 1 quadrant  Discuss/describe a relationship between x and y coordinates  Discuss/describe a relationship between 2 linear variables  **Procedural Knowledge:**  Create an equation for graphs with +ve gradients  Create an equation for graphs with +ve gradients including decimals and fractions  Create an equation for graphs with a positive gradient and +ve intercept  Plot point in 4 quadrants recap  Create an equation for graphs with -ve gradients  Create an equation for graphs with -ve gradients including decimals and fractions  Create an equation for graphs with a -ve intercept  Identify the gradient from y = mx + c  Identify the intercept from y = mx + c  Rearrange to find the above ay = mx + c  Rearrange to find the above mx + y = c  Rearrange to find the above with mx + ay = c  Substitute to generate points with negative  Substitute into an implicit points equations  Check to see if coordinates points on a line  Substitute into and generate coordinate for y = x2+c  Plot and recognise a quadratic graph  Substitute into and generate coordinate for y = -(x)2+c  Substitute into and generate coordinate for y = x2+bx+c  Identify a minimum or maximum for quadratic graph  Identify estimated roots of a quadratic graph  **Conditional Knowledge:**  Recognise physical differences in line with a negative gradient and positive gradients  Apply knowledge to create an equation for a horizontal line  Explore the limitations of your knowledge with a vertical line  Apply knowledge to across a range of linear graphs  Recognise limits of a calculator | 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 | Function, equation Quadratic, cubic, reciprocal Gradient, y-intercept, x-intercept, root Sketch, plot Kinematic Speed, distance, time Acceleration, deceleration Linear, non-linear Parabola, Asymptote Rate of change |
| Checklist RTL | End of unit exam completed for Exploring Graphs.  Reteaching and relearning opportunities will be delivered to each class dependent on the performance of each class. |
| Home | Dr Frost Maths – practising skills using DrFrost.org (a unique username and password will be provided by the school)  We expect Year 9 pupils to spend 30 minutes on homework for Maths per week. |
| **Half Term 1: Expanding and Factorising**  **Declarative Knowledge:**  Understand that single brackets produce a linear graph and double brackets produce a quadratic graph  **Procedural Knowledge:**  Expand brackets with only positives  Expansion with more than 1 letter and/or more than 2 terms  Expansion and simplify with 2 or more brackets  Expansion to problems with negatives within the brackets  Expansion to problems with a negative outside the brackets  Expansion with negative with 2 or more brackets  Expansion with all fractions  Expansion with 2 brackets (all positive)  Expansion with 2 brackets (all negative)  Expansion with 2 brackets (mixed signs)  Expansion with 3 brackets  Factorise into a bracket with only positives and negative inside the bracket  Factorisation with more than 1 factor  Factorisation with negative common factors  Factorise with indices greater than 2  Factorise quadratics (Only positives)  Factorise quadratics (With negatives)  **Conditional Knowledge:**  Know when to expand first or divide first to solve an equation.  Sketch the graph from the factorised quadratic. | 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 | Inequality Identity Equivalent Equation Formula, Formulae Expression Expand Linear Quadratic |
| Checklist RTL | End of unit exam completed for Expanding Factorising.  Reteaching and relearning opportunities will be delivered to each class dependent on the performance of each class. |
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| **Half Term 2: Rounding and Bounds**  **Declarative Knowledge:**  Identify the significant figures of a number in an integer  Identify the significant figures of a number that 0 < n < 1  Identify the decimal places of a number  Know what truncating is  Know the impact of truncating compared to rounding  Know when truncating is more / less appropriate than rounding  **Procedural Knowledge:**  Round numbers to one or two significant figures  Round numbers to one and two decimal places  Identify the minimum and maximum values of an amount that has been rounded (to nearest x, x d.p., x s.f.)  **Conditional Knowledge:**  Use inequalities to describe the range of values for a rounded value  Solve problems involving the maximum and minimum values of an amount that has been rounded | Books | Modelling reading of questions by the class teacher – reading like a Mathematician and BUG  Two key words at the start of each lesson defined  Expectation of Mathematical vocabulary used in lessons |
| Speech | Inequality, Truncate, Round, Minimum, Maximum, Interval, Decimal place, Significant figure, Upper Bound, Lower Bound, Focus digit, Decider digit |
| Checklist RTL | End of unit exam completed for Rounding and Bounds.  Reteaching and relearning opportunities will be delivered to each class dependent on the performance of each class. |
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| **Half Term 2: Laws of Indices**  **Declarative Knowledge:**  Know that an index represents the number of times you multiply the base by itself  Identify an index  Know that expressions with an index and the same base can be simplified using index laws  Know the zero-index law  Know the one-index law  Know that bases with a negative index are the reciprocal of the power  Know that raising fractions to an integer power means raising both numerator and denominator by the power individually and then simplifying  **Procedural Knowledge:**  Evaluate indices with a negative base  Simplify expressions using the law of indices for multiplication  Simplify expressions using the law of indices for division  Simplify expressions using the law of indices for powers  Simplify expressions using the zero-index law  Simplify expressions using the one-index law  Calculate with fractions with integer indices  **Conditional Knowledge:**  Simplify expressions using more than one law of indices  Calculate with negative indices | Books | Modelling reading of questions by the class teacher – reading like a Mathematician and BUG  Two key words at the start of each lesson defined  Expectation of Mathematical vocabulary used in lessons |
| Speech | Index, indices, power, multiply, divide, zero, base, law |
| Checklist RTL | End of unit exams completed for Laws of indices.  Reteaching and relearning opportunities will be delivered to each class dependent on the performance of each class. |
| Home | Dr Frost Maths – practising skills using DrFrost.org (a unique username and password will be provided by the school)  We expect Year 9 pupils to spend 30 minutes on homework for Maths per week. |