**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 gridPlot point in at least 1 quadrant of a coordinate gridPlot co-linear points in 1 quadrantDiscuss/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 gradientsCreate an equation for graphs with +ve gradients including decimals and fractionsCreate an equation for graphs with a positive gradient and +ve interceptPlot point in 4 quadrants recapCreate an equation for graphs with -ve gradientsCreate an equation for graphs with -ve gradients including decimals and fractionsCreate an equation for graphs with a -ve interceptIdentify the gradient from y = mx + cIdentify the intercept from y = mx + cRearrange to find the above ay = mx + cRearrange to find the above mx + y = cRearrange to find the above with mx + ay = c Substitute to generate points with negativeSubstitute into an implicit points equationsCheck to see if coordinates points on a lineSubstitute into and generate coordinate for y = x2+cPlot and recognise a quadratic graphSubstitute into and generate coordinate for y = -(x)2+cSubstitute into and generate coordinate for y = x2+bx+cIdentify a minimum or maximum for quadratic graphIdentify estimated roots of a quadratic graph**Conditional Knowledge:** Recognise physical differences in line with a negative gradient and positive gradientsApply knowledge to create an equation for a horizontal lineExplore the limitations of your knowledge with a vertical lineApply knowledge to across a range of linear graphsRecognise 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 positivesExpansion with more than 1 letter and/or more than 2 termsExpansion and simplify with 2 or more bracketsExpansion to problems with negatives within the bracketsExpansion to problems with a negative outside the bracketsExpansion with negative with 2 or more bracketsExpansion with all fractionsExpansion with 2 brackets (all positive)Expansion with 2 brackets (all negative)Expansion with 2 brackets (mixed signs)Expansion with 3 bracketsFactorise into a bracket with only positives and negative inside the bracketFactorisation with more than 1 factorFactorisation with negative common factorsFactorise with indices greater than 2Factorise 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 integerIdentify the significant figures of a number that 0 < n < 1Identify the decimal places of a numberKnow what truncating isKnow 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 figuresRound numbers to one and two decimal placesIdentify 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 valueSolve 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 BUGTwo 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 indexKnow that expressions with an index and the same base can be simplified using index lawsKnow the zero-index lawKnow the one-index lawKnow that bases with a negative index are the reciprocal of the powerKnow 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 baseSimplify expressions using the law of indices for multiplicationSimplify expressions using the law of indices for divisionSimplify expressions using the law of indices for powersSimplify expressions using the zero-index lawSimplify expressions using the one-index lawCalculate 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 BUGTwo 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.  |
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