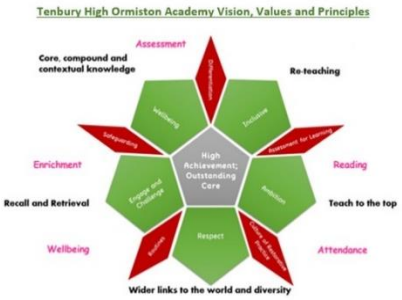
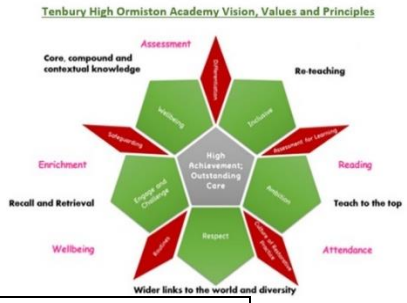
TENBURY HIGH
ORMISTON ACADEMY



Curriculum Overview for Mathematics
Year 11

Half Term 3: Growth and Decay (Higher and Foundation) **Declarative Knowledge:** • Understand the term growth • Understand the term decay **Procedural Knowledge:** • Find percentage of an amount with and without a calculator • Represent a percentage as a decimal multiplier **Conditional Knowledge:** • Solve problems involving growth and decay • Explain the various terms in formal repeated percentage change • Solve problems involving repeated percentage change		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
		Fraction, mixed number percentage change, percentage increase, percentage increase, (exponential) growth, decay
		Throughout the unit there will be independent practise of exam style questions to identify areas for continued revision. At the end of the unit, there will be a formal exam using GCSE style exam questions. Relearning lessons will take place after the formal end of unit exams.
		Dr Frost Maths – practising skills using DrFrost.org (a unique username and password will be provided by the school) Practise exam questions – exam questions for the unit and previous learning set and marked in school.
Half Term 3: Algebra (Quadratics, rearranging, formulae, identities) (Foundation) **Declarative Knowledge:** • Understand and use standard mathematical formulae • Know the difference between an equation and an identity **Procedural Knowledge:**		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
		Formulae, equation, expression, term, identity, manipulate, factorise, expand, simplify, linear, quadratic, powers, roots, indices, rearrange, make x the subject, function, argue, proof.



• Simplify and manipulate algebraic expressions (including those involving surds) by:
  ○ expanding products of two or more binomials
  ○ factorising quadratic expressions of the form $ax^2 + bx + c$ including the difference of two squares
  ○ factorising quadratic expressions of the form $ax^2 + bx + c$
  ○ simplifying expressions involving sums, products and powers, including the laws of indices
• Rearrange formulae to change the subject
 	
Conditional Knowledge:
• Argue mathematically to show algebraic expressions are equivalent, and use algebra to support and construct arguments and proofs
• Where appropriate, interpret simple expressions as functions with inputs and outputs
		Throughout the unit there will be independent practise of exam style questions to identify areas for continued revision.
		At the end of the unit, there will be a formal exam using GCSE style exam questions.
		
		Relearning lessons will take place after the formal end of unit exams.

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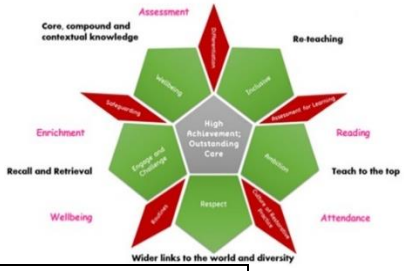
<u>Half Term 3: Solving Simultaneous Equations (Foundation)</u> **Declarative Knowledge:** • Know why we need simultaneous equations • Know what a co-efficient is **Procedural Knowledge:** • Solve puzzles with multiple unknowns starting with known facts. • Solve simultaneous equations with matching co-efficients formally (Same sign) • Solve simultaneous equations where you have different signs for matching terms. • Solve simultaneous equations with co-efficients that are multiples • Solve simultaneous equations by multiplying both equations		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
		Co-efficient, equation, simultaneous equation, variable, manipulate, eliminate, solve, derive, interpret
		Throughout the unit there will be independent practise of exam style questions to identify areas for continued revision. At the end of the unit, there will be a formal exam using GCSE style exam questions.



• Solve simultaneous equations graphically **Conditional Knowledge:** • Choose method and solve simultaneous equations • Rearrange equations to create a standard set up and solve simultaneous equations		Relearning lessons will take place after the formal end of unit exams.
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Half Term 3: Numerical method; iteration (Higher) **Declarative Knowledge:** • Understand x_n notation • Understand what iteration is **Procedural Knowledge:** • Use an iterative process to calculate growth and decay problems • Rearrange equations for iteration • Follow an iterative process **Conditional Knowledge:** • Apply iterative process to solve problems		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
		Notation, iteration, iterative process, growth, decay, decision.
		Throughout the unit there will be independent practise of exam style questions to identify areas for continued revision. At the end of the unit, there will be a formal exam using GCSE style exam questions. Relearning lessons will take place after the formal end of unit exams.
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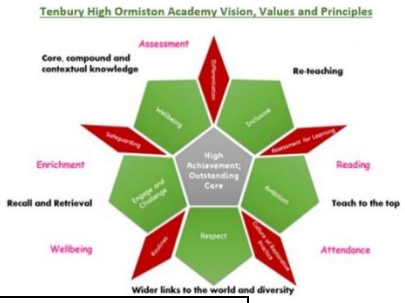

Half Term 3: Algebraic Fractions (Higher) **Declarative Knowledge:** • Know how to factorise an expression • Know how to expand an expression **Procedural Knowledge:** • Add and subtract algebraic fractions • Multiply and divide algebraic fractions • Simplify an algebraic fraction **Conditional Knowledge:** • Recognise algebraic fractions • Recognise when factorising is necessary • Recognise when a common denominator is necessary		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
		Algebraic fraction, common denominator, simplify, expand, factorise.
		Throughout the unit there will be independent practise of exam style questions to identify areas for continued revision. At the end of the unit, there will be a formal exam using GCSE style exam questions. Relearning lessons will take place after the formal end of unit exams.
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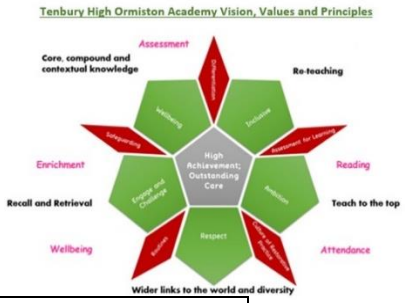
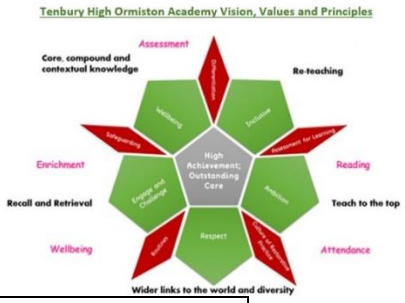
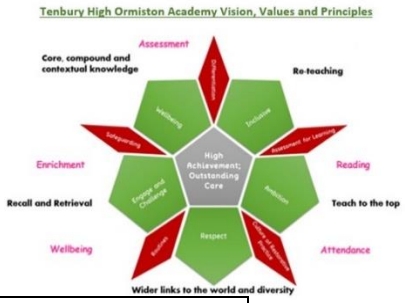
Half Term 3: Equation of a Circle (Higher) **Declarative Knowledge:** • Know and use the equation of a circle with centre at the origin • Know that perpendicular lines have gradients with a product of -1 **Procedural Knowledge:** • Use Pythagoras to calculate the radius of a circle • Use Pythagoras to write a relationship between a point on the circumference of a circle and the radius • Identify the coordinates on the circumference of the circle when given the radius		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
		Function, equation Linear, non-linear, parallel, perpendicular, gradient, y-intercept, x-intercept, root, sketch, plot, centre (of a circle), radius, tangent
		Throughout the unit there will be independent practise of exam style questions to identify areas for continued revision.



• Identify the radius of a circle when given its equation • Calculate the equation of a tangent to a circle **Conditional Knowledge:** • Solve problems involving the equation of a circle • Identify perpendicular lines using algebraic methods • Identify the equation of a circle from its graph • Use the equation of a circle to draw its graph • Find the equation of a tangent to circle at a given point • Solve algebraic problems involving tangents to a circle		At the end of the unit, there will be a formal exam using GCSE style exam questions. Relearning lessons will take place after the formal end of unit exams.
		Dr Frost Maths – practising skills using DrFrost.org (a unique username and password will be provided by the school) Practise exam questions – exam questions for the unit and previous learning set and marked in school.
Half Term 4: Quadratic Graphs and Solving Quadratic equations (Foundation) **Declarative Knowledge:** • Recognise, sketch and interpret graphs of quadratic functions **Procedural Knowledge:** • Solve a quadratic equation of the form $x^2 + bx + c = 0$ by factorising • Solve a quadratic equation by rearranging and factorising • Find approximate solutions to quadratic equations using a graph • Deduce roots of quadratic functions algebraically **Conditional Knowledge:** • Identify and interpret roots, intercepts and turning points of quadratic functions graphically • Deduce roots algebraically		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
		(Quadratic) equation, factorise, rearrange, variable, unknown, manipulate, solve, deduce, x-intercept, root.
		Throughout the unit there will be independent practise of exam style questions to identify areas for continued revision. At the end of the unit, there will be a formal exam using GCSE style exam questions. Relearning lessons will take place after the formal end of unit exams.



• Make connections between graphs and quadratic equations of the form $ax^2 + bx + c = 0$ • Make connections between graphs and quadratic equations of the form $ax^2 + bx + c = dx + e$		Dr Frost Maths – practising skills using DrFrost.org (a unique username and password will be provided by the school) Practise exam questions – exam questions for the unit and previous learning set and marked in school.
Half Term 4: Transforming Functions (Higher) **Declarative Knowledge:** • Know the effects of transforming the graph y = f(x): f(x) + a, f(x + a), y = f(-x) and y = -f(x) **Procedural Knowledge:** • Plot and use the key features of the graph of an exponential function, $y = k^x$, for positive values of k • Plot and use the key features of the graph of the trigonometric function y = sin x • Plot and use the key features of the graph of the trigonometric function y = cos x • Plot and use the key features of the graph of the trigonometric function y = tan x **Conditional Knowledge:** • Solve simple problems involving the transformation of graphs • Solve more complex problems involving the transformation of graphs		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
		Exponential function, equation, linear, non-linear, quadratic, cubic, reciprocal, exponential, parabola, asymptote, maximum, minimum, gradient, y-intercept, x-intercept, root sketch, plot, arguments
		Throughout the unit there will be independent practise of exam style questions to identify areas for continued revision. At the end of the unit, there will be a formal exam using GCSE style exam questions. Relearning lessons will take place after the formal end of unit exams.
		Dr Frost Maths – practising skills using DrFrost.org (a unique username and password will be provided by the school) Practise exam questions – exam questions for the unit and previous learning set and marked in school.



Half Term 4: Targeted Revision Informed by the Mock Examinations **Knowledge will be dependent on each group based on mock exam analysis.**		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
		Revision – either set on Dr Frost or exam style questions which are marked in school.