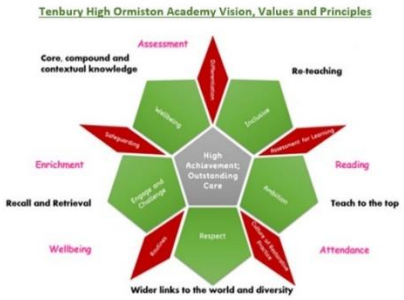
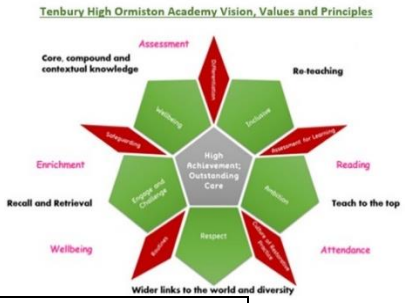
TENBURY HIGH
ORMISTON ACADEMY

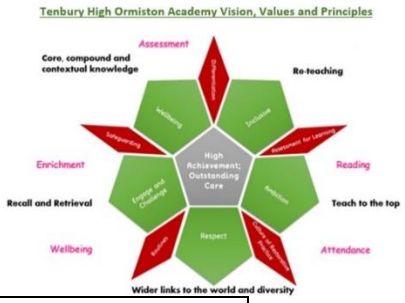


Curriculum Overview for Mathematics
Year 10

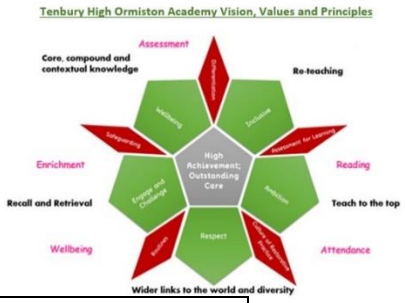
Half Term 1: Number Properties **Declarative Knowledge:** Know the square numbers up to 15x15 Know the cube numbers up to 10x10x10 Know the notation for indices Know that a root is the inverse of raising a number to an index Know what a prime number is Know what a composite number is Know the order to calculate an operation in Know the commutative law of multiplication and addition Recognise negative numbers being less than zero **Procedural Knowledge:** Evaluate indices Simplify expressions with indices Simplify expressions using index laws where the same base is being multiplied Simplify expressions using index laws where the same base is being divided Identify whether a number is prime or composite Find the prime factors of a number – prime factor decomposition Calculate using the order of operations Use the commutative law of multiplication and addition in calculations Place numbers in order, including negative numbers Use a number line with negative numbers Add and subtract with negative numbers Multiply and divide with negative numbers **Conditional Knowledge:** Calculate the Highest Common Factor (HCF) using prime factor decomposition Calculate the Lowest Common Multiple (LCM) using prime factor decomposition Change the order of an operation by applying brackets Represent the value of numbers on a number line	   	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 Index/indices, square, cube, exponent, power, root, base, prime, composite, prime factorisation, operation, bracket, commutative, negative, directed number, zero, add, subtract, multiply, divide 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. 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:** Recognise that a fraction is part of a whole Know that improper fractions are parts of a whole that are attached to a whole written as a numerator being larger than the denominator Identify terminating and recurring decimals **Procedural Knowledge:** Find equivalent fractions Simplify fractions Calculate the compliment of a fraction Add fractions Subtract fractions Multiply fractions Divide fractions Calculate fractions of an amount Find a fraction of an amount Express one value of another as a fraction Increase and decrease an amount by a fraction Find the reciprocal of a number Convert between fractions, decimals and percentages Calculate percentages of amounts Use decimal multipliers to calculate a percentage of an amount Calculate a percentage increase or decrease Multiply by numbers between 0 and 1 **Conditional Knowledge:** Compare fractions with a common denominator Compare fractions with a common numerator Represent percentages pictorally Recognise simple interest as a percentage increase Calculate simple interest	   	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 Fraction, improper fraction, mixed number, equivalent, simplify, numerator, denominator, compliment, increase, decrease, reciprocal, decimal, percentage, percentage change, proportion, increase, decrease, original value 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. 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: Basic Algebra and Sequences **Declarative Knowledge:** Use and interpret algebraic notation, including $y + y + y$ and $3 \times y$ being $3y$ a^2 in place of a x a; a^3 in place of $a \times a \times a$		Modelling reading of questions by the class teacher – teaching like a Mathematician Two key words at the start of each lesson defined



a^2b in place of $a \times a \times b$ $\frac{a}{b}$ in place of $a \div b$ 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		Expectation of Mathematical vocabulary used in lessons
		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
		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.
		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		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
		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



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		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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