



# Curriculum Overview for Mathematics Year 11

Foundation Half Term 1: Representing Number		Modelling reading of questions by the class teacher – teaching like a Mathematician Two key words at the start of each lesson
Declarative Knowledge:		defined
Recognise powers of 2, 3, 4, 5		Expectation of Mathematical vocabulary
Know the meaning of inequality		used in lessons
Know the meaning of less than and more than (or equal to)		Standard form Inequality Truncate Bound
signs		Minimum Maximum Interval Decimal place
5.6.15		Significant figure
Procedural Knowledge:		(Linear) inequality Unknown Manipulate
Round numbers and measures to an appropriate degree of		(Linear) inequality Onknown Manipulate
accuracy (e.g. to a specified number of decimal places or significant figures)		Solve Solution Set Integer
Significant figures)		A formal end of unit exam will take place at
Use inequality notation to specify simple error intervals due to		the end of the unit. The questions will be
truncation or rounding	<b> </b> –	taken from the exam board bank of
Use positive integer powers and associated real roots (square,		questions.
cube and higher)	<b>—</b> •	
Calculate with roots and with integer indices		Reteaching / relearning will be class
Calculate with and interpret standard form A x 10" where		dependent subject to the performance of the
1≤ A < 10 and `n` is an integer		class.
Solve linear inequalities in one variable		Practise Exam Questions based on the
Represent the solution set on a number line		current unit or previous units to build recall.
Conditional Knowledge:		Dr Frost Maths – practising skills using
Apply and interpret limits of accuracy		DrFrost.org (a unique username and
Understand and use place value in context (e.g. when		password will be provided by the school)
working with very large or very small numbers)		password will be provided by the schooly
		We expect Year 11 pupils to spend 1 hour on
		Maths homework per week (on average over
		the half-term – this may be higher nearer
		avams or lower at other times)
		exams of lower at other times).
Half Term 1: Algebra and Graphs		Modelling reading of questions by the class
		teacher – teaching like a Mathematician
Declarative Knowledge:		Two key words at the start of each lesson
Know that linear graphs form a straight line		defined
Recognise, sketch and interpret graphs of linear functions,	$\checkmark$	Expectation of Mathematical vocabulary
quadratic functions, simple cubic functions and the reciprocal		used in lessons
function		Algebra, algebraic, algebraically, Unknown,
		Equation, Operation, Solve, Solution,
Procedural Knowledge:		Brackets, Symbol, Substitute, Graph.
Solve linear equations in one unknown algebraically		Function, equation Quadratic, cubic,
Including those with the unknown on both sides of the		reciprocal Gradient, v-intercept, x-intercept,
equation		root Sketch, plot Kinematic Speed, distance
Find approximate solutions using a graph		time Acceleration deceleration Linear non-
Translate simple situations or procedures into algebraic		linear Parabola
expressions or formulae		A formal and of unit ayam will take place at
derive an equation (or two simultaneous equations) solve		the end of the unit. The questions will be
the equation (c) and interpret the solution	<b>— ~</b>	taken from the overn beautions will be
		taken from the exam board bank of
		questions.



Tenbury High Ormiston Academy Vision, Values and Principles

	Wider links to the world and diversity
Conditional Knowledge:	Reteaching / relearning will be class
Translate simple situations or procedures into algebraic	dependent subject to the performance of the
expressions or formulae	class.
derive an equation (or two simultaneous equations), solve	
the equation(s) and interpret the solution	
	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 11 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).

Higher	Modelling reading of questions by the class
Half Term 1: Representing Number	teacher – teaching like a Mathematician
	Two key words at the start of each lesson
Declarative Knowledge:	defined
• Recognise powers of 2, 3, 4, 5	Expectation of Mathematical vocabulary
	used in lessons
Procedural Knowledge:	Power Root Index, Indices Standard form
<ul> <li>Round numbers and measures to an appropriate</li> </ul>	Inequality Truncate Round Minimum,
degree of accuracy (e.g. to a specified number of	Maximum Interval Decimal place Significant
decimal places or significant figures)	figure
<ul> <li><u>Use inequality notation to specify simple error</u></li> </ul>	
intervals due to truncation or rounding	
<ul> <li>Use positive integer powers and associated real</li> </ul>	A formal end of unit exam will take place at
roots (square, cube and higher)	the end of the unit. The questions will be
<ul> <li><u>Calculate with roots, and with integer</u> and</li> </ul>	taken from the exam board bank of
fractional indices	- 🗸 questions.
• Understand and use place value (e.g. when working	<b>-</b> ✓
with very large or very small numbers)	Reteaching / relearning will be class
Calculate with and interpret standard	dependent subject to the performance of the
form $A \times 10^{n}$ where $1 \le A \le 10$ and 'p' is an	class.
integer	Practise Exam Questions based on the
Integer	current unit or previous units to build recall.
Calculate exactly with surds     Circulate exactly with surds	
<ul> <li>Simplify surd expressions involving squares (eg sqrt</li> </ul>	Dr Frost Maths – practising skills using
12 = sqrt(4 xx 3) = sqrt 4 xx sqrt 3 = 2 sqrt 3) and	DrFrost.org (a unique username and
rationalise denominators	password will be provided by the school)
Recognise and use <u>simple geometric progressions</u>	
(r <sup>n</sup> where n is an integer and <b>r is a surd</b> )	We expect Year 11 pupils to spend 1 hour on
	Maths homework per week (on average over
Conditional Knowledge:	the half-term – this may be higher nearer
	exams or lower at other times).
Apply and interpret limits of accuracy including	
upper and lower bounds	
<ul> <li>Estimate powers and roots of any given positive</li> </ul>	
number	





unbiased, fair Relative frequency Enumerate

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Half Term 1: Algebra: quadratics, rearranging, formulae and		Modelling reading of questions by the class
dentities		teacher – teaching like a Mathematician
		Two key words at the start of each lesson
Declarative Knowledge:		defined
Know the difference between an equation and an identity	$\sim$	Expectation of Mathematical vocabulary
		used in lessons
Procedural Knowledge:		Inequality, Identity, Equivalent, Equation,
Simplify and manipulate algebraic expressions (including		Formula, Formulae, Expression, Expand,
those involving surds) by: expanding products of two or		Linear. Ouadratic
more binomials; factorising quadratic expressions of the		Exponential Function, equation Linear, non-
form $ax^2 + bx + c$ including the difference of two squares:		linear Quadratic, cubic, reciprocal,
		exponential Parabola Asymptote Maximum,
factorising quadratic expressions of the form $dx^2 + bx + c$ ;		minimum, period Gradient, v-intercept, x-
simplifying expressions involving sums, products and powers,		intercept, root Sketch, plot Arguments
ncluding the laws of indices		A formal end of unit exam will take place at
Understand and use standard mathematical formulae		the end of the unit. The questions will be
Rearrange formulae to change the subject		taken from the exam board bank of
Recognise, sketch and interpret graphs of linear functions,		questions.
quadratic functions, simple cubic functions and the reciprocal	<b>—</b> ✓	
. 1.		Reteaching / relearning will be class
y = -		dependent subject to the performance of the
function $x \text{ with } x \neq 0$ , exponential functions $y = \kappa x$		class.
for positive values of $k$ , and the trigonometric functions		Practise Exam Questions based on the
with arguments in		current unit or previous units to build recall.
$y = \sin x$ $y = \cos x$ and $y = \tan x$		
degrees) $y = \sin x$ , $y = \cos x$ and $y = \tan x$ for angles		Dr Frost Maths – practising skills using
of any size		DrFrost.org (a unique username and
		password will be provided by the school)
Conditional Knowledge:		We expect Year 11 pupils to spend 1 hour on
Argue mathematically to show algebraic expressions are		Maths homework per week (on average over
equivalent, and use algebra to support and construct		the half-term – this may be higher nearer
arguments and proofs		exams or lower at other times).
Where appropriate, interpret simple expressions as functions		,
with inputs and outputs		
nterpret the reverse process as the 'inverse function'		
nterpret the succession of two functions as a 'composite		
function'		

**Foundation** Modelling reading of questions by the class Half Term 2: Probability teacher - teaching like a Mathematician Two key words at the start of each lesson **Declarative Knowledge:** defined Apply the property that the probabilities of an exhaustive set Expectation of Mathematical vocabulary of outcomes sum to one used in lessons Outcome, equally likely outcomes Event, **Procedural Knowledge:** independent event, dependent event Tree Record, describe and analyse the frequency of outcomes of diagrams Theoretical probability probability experiments using tables and frequency trees Experimental probability Random Bias,





	Wider links to the world and diversity
Construct theoretical possibility spaces for single and combined experiments with equally likely outcomes and use these to calculate theoretical probabilities Apply ideas of randomness, fairness and equally likely events to calculate expected outcomes or multiple future experiments	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.
experiments	dependent subject to the performance of the
Conditional Knowledge:	
Understand that empirical unbiased samples tend towards	Practise Exam Questions based on the
theoretical probability distributions with increasing sample	current unit or previous units to build recall.
Fnumerate sets and combinations of sets systematically using	Dr Frost Maths – practising skills using
tables, grids, Venn diagrams and tree diagrams	DrFrost.org (a unique username and
Calculate the probability of independent and dependent combined events in context, including using tree diagrams	password will be provided by the school)
and other representations, and know the underlying	We expect Year 11 pupils to spend 1 hour on
assumptions	Maths homework per week (on average over
	the half-term – this may be higher nearer exams or lower at other times).
Half Term 2: Vectors and Measures	Modelling reading of questions by the class
Declarative Knowledge:	Two key words at the start of each lesson
Know that a vector has a magnitude and a direction	defined
Know standard units of measure and related concepts	Expectation of Mathematical vocabulary
(length, area, volume / capacity, mass, time, money etc)	used in lessons
	Vector, Scalar, Constant, Magnitude,
Procedural Knowledge:	Direct proportion, Inverse proportion,
Understand addition and subtraction of vectors,	Multiplier, Linear, Congruent, Congruence,
multiplication of vectors by a scalar, and diagrammatic and	Similar, Similarity, Compound unit, Density,
Column representation of vectors	Population density, Pressure, Surd, Limit
length area volume/capacity mass) and compound units	
(e.g. speed, rates of pay, prices, density, pressure) in	A formal end of unit exam will take place at
numerical and algebraic contexts	
Use compound units such as speed, rates of pay, unit	
pricing, density and pressure	
	Reteaching / relearning will be class
Conditional Knowledge:	dependent subject to the performance of the
Apply addition and subtraction of vectors, multiplication of	class.
vectors by a scalar, and diagrammatic and column	Practise Exam Questions based on the
representation of vectors	current unit or previous units to build recall.
measures (including standard compound measures) using	
decimal quantities where appropriate	Dr Frost Maths – practising skills using
acciniai quantales miere appropriate	DrFrost.org (a unique username and password will be provided by the school)
	password will be provided by the school)
	We expect Year 11 pupils to spend 1 hour on
	Maths homework per week (on average over
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	exams or lower at other times).
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# <u>Higher</u>

### Half Term 2: Further Equations with graphs

## Declarative Knowledge:

Know the difference between a linear and a quadratic graph. **Procedural Knowledge:** 

- Solve linear equations in one unknown algebraically <u>including those with the unknown on</u> <u>both sides of the equation</u>
- Find approximate solutions using a graph
- Solve quadratic equations (including those that require rearrangement) algebraically by factorising, by completing the square and by using the quadratic formula
- Find approximate solutions using a graph
- Identify and interpret roots, intercepts and turning points of quadratic functions graphically; deduce roots algebraically and turning points by completing the square

### Conditional Knowledge:

- Recognise, sketch and interpret graphs of linear and quadratic functions
- <u>Translate simple situations or procedures into</u>
   <u>algebraic expressions or formulae</u>
- <u>derive an equation, solve the equation and interpret</u> <u>the solution</u>

Half Te	erm 2:	Proba	bility

## **Declarative Knowledge:**

## Procedural Knowledge:

- <u>Calculate the probability of independent and</u> <u>dependent combined events, including using tree</u> <u>diagrams and other representations, and know the</u> <u>underlying assumptions</u>
- Calculate conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams
- Enumerate sets and combinations of sets systematically, using tables, grids, Venn diagrams <u>and tree diagrams</u>

#### **Conditional Knowledge:**

 Apply ideas of randomness, fairness and equally likely events to calculate expected outcomes or multiple future experiments

	Wider links to the world and diversity
	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
	Quadratic) equation Factorise Rearrange Complete the square Unknown Manipulate Maximum, minimum Parabola Recurrence relation Interval bisection
     	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 11 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).
	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
	Outcome, equally likely outcomes Event, independent event, dependent event Tree diagrams Theoretical probability Experimental probability Random Bias, unbiased, fair Relative frequency Enumerate Se
	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.





- Understand that empirical unbiased samples tend towards theoretical probability distributions with increasing sample size
- Interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams



## **Declarative Knowledge:**

**Know that vectors have a direction and a magnitude.** Know standard units of measure and related concepts (length, area, volume / capacity, mass, time, money etc)

### **Procedural Knowledge:**

Apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representation of vectors

Use standard units of mass, length, time, money and other measures (including standard compound measures) using decimal quantities where appropriate

Change freely between related standard units (e.g. time, length, area, volume / capacity, mass) and compound units (e.g. speed, rates of pay, prices, <u>density</u>, <u>pressure</u>) in numerical <u>and algebraic contexts</u>

Use compound units such as speed, rates of pay, unit pricing, <u>density and pressure</u>

#### **Conditional Knowledge:**

Use vectors to construct geometric arguments and proofs



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)

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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 Vector, Scalar, Constant, Magnitude, Direct proportion, Inverse proportion, Multiplier, Linear, Congruent, Congruence, Similar, Similarity, Compound unit, Density, Population density, Pressure, Surd, Limit



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)

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