



# Edexcel Specification Alignment GCSE 2015 / 2016 Exams

## Foundation

This alignment document lists all Mathletics curriculum activities associated with the 'GCSE Foundation 2015 & 2016 Exam' course, and demonstrates how these fit with the Edexcel specification for the foundation tier GCSE being taken in 2015 and 2016.

As new activities are developed, this document will be updated. You can download the latest version from the training and support portal:

[www.3plearning.com/uk/mathleticsalignment/england](http://www.3plearning.com/uk/mathleticsalignment/england)

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## Foundation

Expectation	Topic	Activity
<b>Number</b>		
N a Add, subtract, multiply and divide any number	Number - Addition & Subtraction	Add Integers
		Subtract Integers
		More with Integers
		Problems: Add and Subtract 2
		Column Addition 1
		Adding Colossal Columns
		Subtracting Colossal Columns
		Bar Model Problems 1
		Bar Model Problems 2
	Number - Multiplication & Division	Multiplying by 10, 100, 1000
		Dividing by 10, 100, 1000
		Mental Methods Multiplication
		Problems: Multiply and Divide 1
		Long Multiplication
		Short Multiplication
		Mental Methods Division
		Long Division
		Short Division
N b Order rational numbers	Number - Fractions	Ordering Fractions
	Number - Decimals	Decimal Order
N c Use the concepts and vocabulary of factor (divisor), multiple, common factor, Highest Common Factor (HCF), Least Common Multiple (LCM), prime number and prime factor decomposition	Number - Properties	Multiples
		Lowest Common Multiple
		Factors
		Highest Common Factor
		Prime or Composite?
		Product of Prime Factors
N d Use the terms square, positive and negative square root, cube and cube root	Number - Indices	Square and Cube Roots
	Number - Indices	Square and Cube Roots
N e Use index notation for squares, cubes and powers of 10	Number - Indices	Square and Cube Roots
	Number - Indices	Square and Cube Roots
N f Use index laws for multiplication and division of integer powers	Number - Indices	Multiplication with Indices
		Index Laws and Algebra
N h Understand equivalent fractions, simplifying a fraction by cancelling all common factors	Number - Fractions	Simplifying Fractions
		Equivalent Fractions

## Foundation

Expectation	Topic	Activity
N i Add and subtract fractions	Number - Fractions	Common Denominator
		No Common Denominator
		Add Like Mixed Numbers
		Subtract Like Mixed Numbers
		Add Unlike Mixed Numbers
		Subtract Unlike Mixed Numbers
N j Use decimal notation and recognise that each terminating decimal is a fraction	Number - Fractions	Fraction to Terminating Decimal
	Number - Decimals	Decimals from Words to Digits 1
		Decimal Place Value
N k Recognise that recurring decimals are exact fractions, and that some exact fractions are recurring decimals	Number - Decimals	Recurring Decimals
N l Understand that 'percentage' means 'number of parts per 100' and use this to compare proportions	Number - Percentages	Modelling Percentages
		Percentage Composition
N m Use percentage	Number - Percentages	Percentage Word Problems
		Solve Percent Equations
		Profit and Loss
		Simple Interest
		Percentage Increase and Decrease
N o Interpret fractions, decimals and percentages as operators	Number - Percentages	Percentage of a Quantity
	Number - Fractions	Calculating Percentages
		Fraction of an Amount
N p Use ratio notation, including reduction to its simplest form and its various links to fraction notation	Number - Ratio & Proportion	Ratio
		Equivalent Ratios
		Ratio and Proportion
N q Understand and use number operations and the relationships between them, including inverse operations and hierarchy of operations	Number - Multiplication & Division	Order of Operations 1
		Order of Operations 2
N t Divide a quantity in a given ratio	Number - Ratio & Proportion	Dividing a Quantity in a Ratio
		Ratio and Proportion
		Ratio Word Problems
N u Approximate to specified or appropriate degrees of accuracy including a given power of ten, number of decimal places and significant figures	Number - Estimation and Accuracy	Rounding Significant Figures
		Rounding Decimals
N v Use calculators effectively and efficiently, including statistical functions		

## Foundation

Expectation	Topic	Activity
<b>Algebra</b>		
A a Distinguish the different roles played by letter symbols in algebra, using the correct notation		
A b Distinguish in meaning between the words 'equation', 'formula' and 'expression'	Algebra - Expanding & Factorising	Writing Algebraic Expressions
	Algebra - Formulae & Substitution	Real Formulae
	Algebra - Linear Equations	Writing Equations
A c Manipulate algebraic expressions by collecting like terms, by multiplying a single term over a bracket, and by taking out common factors	Algebra - Expressions	Like Terms: Add and Subtract
		Simplifying Expressions
		Algebraic Multiplication
	Algebra - Expanding & Factorising	Expanding with Negatives
		Expand then Simplify
		Factorising
		Factorising Expressions
Algebra - Expanding & Factorising	Factorising with Negatives	
	Factorising with Indices	
A d Set up and solve simple equations	Algebra - Linear Equations	Equations to Solve Problems
		Writing Equations
		Write an Equation: Word Problems
A f Derive a formula, substitute numbers into a formula and change the subject of a formula	Algebra - Formulae & Substitution	Changing the Subject
		Substitution in Formulae
		More Substitution in Formulae
		Real Formulae
A g Solve linear inequalities in one variables, and represent the solution set on a number line	Algebra - Inequalities	Solving Inequalities 1
		Solving Inequalities 2
		Solving Inequalities 3
		Graphing Inequalities 1
		Graphing Inequalities 2
		Graphing Inequalities 3
A h Use systematic trial and improvement to find approximate solutions of equations where there is no simple analytical method of solving them	Algebra - Linear Equations	Checking Solutions
A i Generate terms of a sequence using term-to-term and position-to-term definitions of the sequence	Algebra - Sequences	Increasing Patterns
		Decreasing Patterns
		Describing Patterns

## Foundation

Expectation	Topic	Activity
A j Use linear expressions to describe the nth term of an arithmetic sequence	Algebra - Sequences	Find the Function Rule
		Linear Expressions for the Nth Term
		Terms: Arithmetic Progressions
A k Use the conventions for coordinates in the plane and plot points in all four quadrants, including using geometric information	Algebra - Graphing Equations	Graphing from a Table of Values
		Reading Values from a Line
A l Recognise and plot equations that correspond to straight-line graphs in the coordinate plane, including finding gradients	Algebra - Graphing Equations	Determining a Rule for a Line
		Which Straight Line?
		Equation of a Line 1
		Gradient
A r Construct linear functions from real-life problems and plot their corresponding graphs	Algebra - Graphing Equations	Modelling Linear Relationships
A s Discuss, plot and interpret graphs (which may be non-linear) modelling real situations		
A t Generate points and plot graphs of simple quadratic functions, and use these to find approximate solutions	Algebra - Graphing Equations	Graphing Parabolas
<b>Geometry</b>		
GM a Recall and use properties of angles at a point, angles on a straight line (including right angles), perpendicular lines, and opposite angles at a vertex	Geometry - Shape & Angle Properties	Angles in a Revolution
		Parallel Lines
		Angles and Parallel Lines
GM b Understand and use the angle properties of parallel and intersecting lines, triangles and quadrilaterals	Geometry - Shape & Angle Properties	Angle Sum of a Triangle
		Exterior Angles of a Triangle
		Angle Sum of a Quadrilateral
GM c Calculate and use the sums of the interior and exterior angles of polygons	Geometry - Shape & Angle Properties	Interior and Exterior Angles
GM d Recall the properties and definitions of special types of quadrilateral, including square, rectangle, parallelogram, trapezium, kite and rhombus	Geometry - Shape & Angle Properties	Plane Figure Terms
		Plane Figure Theorems
GM e Recognise reflection and rotation symmetry of 2-D shapes	Geometry - Transformations	Rotational Symmetry
		Symmetry or Not?
GM f Understand congruence and similarity	Geometry - Transformations	Similar Figures
		Using Similar Triangles
		Scale Factor
		Congruent Triangles
		Congruent Figures (Grid)
		Congruent Figures: Find Values
GM g Use Pythagoras' theorem in 2-D	Geometry - Shape & Angle Properties	Pythagoras' Theorem
		Pythagorean Triads





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Expectation	Topic	Activity
GM i Distinguish between centre, radius, chord, diameter, circumference, tangent, arc, sector and segment	Geometry - Shape & Angle Properties	Circle Terms
GM k Use 2-D representations of 3-D shapes		
GM l Describe and transform 2-D shapes using single or combined rotations, reflections, translations, or enlargements by a positive scale factor and distinguish properties that are preserved under particular transformations	Geometry - Transformations	Rotations: Coordinate Plane Transformations: Coordinate Plane Scale Factor
GM v Use straight edge and a pair of compasses to carry out constructions		
GM w Construct loci		
GM x Calculate perimeters and areas of shapes made from triangles and rectangles	Geometry - Perimeter & Area	Perimeter: Composite Shapes Area: Composite Shapes
GM z Find circumferences and areas of circles	Geometry - Perimeter & Area	Circumference: Circles Area: Circles
GM aa Calculate volumes of right prisms and shapes made from cubes and cuboids	Geometry - Volume & Surface Area	Volume: Prisms Volume: Rectangular Prisms 1 Volume: Triangular Prisms Volume: Cylinders
<b>Measures</b>		
GM m Use and interpret maps and scale drawings	Measure - Scales & Conversions	Scale
GM n Understand the effect of enlargement for perimeter, area and volume of shapes and solids	Measure - Scales & Conversions	Perimeter, Area, Dimension Change
GM o Interpret scales on a range of measuring instruments and recognise the inaccuracy of measurements	Number - Estimation and Accuracy	Error in Measurement
GM p Convert measurements from one unit to another	Measure - Scales & Conversions	Grams and Milligrams Grams and Kilograms Converting Units of Mass Centimetres and Metres Converting Units of Length Converting Units of Area Converting Volume
GM q Make sensible estimates of a range of measures		
GM r Understand and use bearings		



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## Foundation

Expectation	Topic	Activity
GM s Understand and use compound measures	Number - Ratio & Proportion	Average Speed
		Time Taken
		Distance Travelled
GM t Measure and draw lines and angles	Geometry - Shape & Angle Properties	Measuring Angles
GM u Draw triangles and other 2-D shapes using ruler and protractor		
<b>Statistics</b>		
SP a Understand and use statistical problem solving process/handling data cycle		
SP b Identify possible sources of bias		
SP c Design an experiment or survey		
SP d Design data-collection sheets distinguishing between different types of data		
SP e Extract data from printed tables and lists	Statistics - Interpretation	Mean
		Median
		Mode
		Mean from Frequency Table
		Median from Frequency
		Mode from Frequency Table
	Statistics - Presentation	Tally Charts
SP f Design and use two-way tables for discrete and grouped data	Probability	Probability Tables
		Two-way Table Probability
		Dice and Coins
SP g Produce charts and diagrams for various data types	Statistics - Presentation	Scatter Plots
		Stem and Leaf Introduction
		Tally Charts
		Pie Charts
		Pie Chart Calculations
		Histograms
		Frequency Histograms

## Foundation

Expectation	Topic	Activity
SP h Calculate median, mean, range, mode and modal class	Statistics - Interpretation	Mean
		Median
		Mode
		Data Extremes and Range
		Mean from Frequency Table
		Median from Frequency
		Mode from Frequency Table
		Median from Stem and Leaf Plot
		Mode from Stem and Leaf Plot
		Data Extremes and Range
Grouping Data and Modal Class		
SP i Interpret a wide range of graphs and diagrams and draw conclusions		
SP j Look at data to find patterns and exceptions		
SP k Recognise correlation and draw and/or use lines of best fit by eye, understanding what these represent	Statistics - Interpretation	Correlation
	Statistics - Presentation	Scatter Plots
SP l Compare distributions and make inferences		
SP u Use calculators efficiently and effectively, including statistical functions		
SP m Understand and use the vocabulary of probability and probability scale	Probability	Probability Scale
SP n Understand and use estimates or measures of probability from theoretical models (including equally likely outcomes), or from relative frequency	Probability	Relative Frequency
		Simple Probability
		Find the Probability
		Probability Tables
SP o List all outcomes for single events, and for two successive events, in a systematic way and derive relative probabilities	Probability	How Many Combinations?
		Counting Techniques 1
SP p Identify different mutually exclusive outcomes and know that the sum of the probabilities of all these outcomes is 1	Probability	Complementary Events
SP s Compare experimental data and theoretical probabilities		
SP t Understand that if they repeat an experiment, they may – and usually will – get different outcomes, and that increasing sample size generally leads to better estimates of probability and population characteristics		