Mathletics

England Key Stage 3

Activities (Courses) and Skill Quests

May, 2026

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Number

Understand and use place value for decimals, measures and integers of any size	
Activities	
Number - Decimals	Decimal Place Value
Number - Estimation & Accuracy	Place Value to Billions
Skill Quests	
Use place value	Understanding and using place value
	Partitioning using place value

Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥	
Activities	
Number - Fractions	Arranging Fractions
Number - Decimals	Comparing Decimals
	Decimal Order
Skill Quests	
Order and compare numbers	Ordering integers
	Ordering decimals
	Comparing and ordering proper fractions
	Comparing and ordering mixed fractions
	Comparing and ordering fractions and decimals

Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property	
Activities	
Number - Properties	Multiples
	Find the Factor
	Factors
	Lowest Common Multiple
	Highest Common Factor
	Prime or Composite?
	Product of Prime Factors
Skill Quests	
Products, factors & prime factorisation	Products, factors and prime factorisation

Use the 4 operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative	
Activities	
Number - Addition & Subtraction	Add Integers
	Subtract Integers
	More with Integers
Number - Multiplication & Division	Integers: Multiplication and Division
Number - Fractions	One Take Fraction

	No Common Denominator
	Model Fractions to Multiply
	Multiplying Fractions
	Dividing Fractions
Number - Decimals	Adding and Subtracting Decimals
	Divide Decimal by Whole Number
	Multiply Decimals 1
	Decimal by Decimal
	Decimal by Whole Number
	Divide Decimal by Decimal
Skill Quests	
Use the four operations	Adding and subtracting integers
	Adding and subtracting rational numbers
	Multiplying integers, decimals and fractions
	Dividing with decimals
	Dividing fractions and decimals
	Multiple operations: integers, decimals, fractions

Use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals	
Activities	
Number - Multiplication & Division	Identifying Errors in Applying the Order of Operations
	Order of Operations 1 (BIDMAS)/Order of Operations 1 (BEDMAS)
Skill Quests	
Order of operations	Simple order of operations
	Further order of operations

Recognise and use relationships between operations including inverse operations	
Activities	
Teacher directed	
Skill Quests	
Inverse operations	Inverse operations

Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations	
Activities	
Number - Estimation & Accuracy	Estimate Square Roots
Number - Powers & Roots	Square Roots
	Square and Cube Roots
	Index Notation/Exponent Notation
	Index Form to Numbers/Exponent Form to Numbers
	Simplifying with Index Laws 1/Simplifying with Exponent Laws 1
	Index Notation and Algebra/Exponent Notation and Algebra
	Index Laws and Algebra/Exponent Laws and Algebra
	Index Laws with Brackets/Exponent Laws with Brackets
	Multiplication and Division with Indices/Multiplication and Division with Exponents
Skill Quests	
Use powers and real roots	Using powers and real roots

Interpret and compare numbers in standard form A x 10^n, 1≤A<10, where n is a positive or negative integer or 0	
Activities	
Number - Powers & Roots	Scientific Notation 1
	Scientific Notation 2
	Scientific Notation to Decimal
	Ordering Scientific Notation
Skill Quests	
Use standard form	Using standard form with integers
	Further standard form: Decimals and calculations

Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and 7/2 or 0.375 and 3/8)	
Activities	
Number - Decimals	Decimals to Fractions 1
Skill Quests	
Terminate decimals & their fractions	Terminating decimals & corresponding fractions

Define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express 1 quantity as a percentage of another, compare 2 quantities using percentages, and work with percentages greater than 100%	
Activities	
Number - Decimals	Decimal to Percentage
Number - Percentages	Modelling Percentages
	Percents and Decimals
	Percentage to Fraction
	Percentage Composition/What percentage?
Skill Quests	
Work with percentages	Defining, comparing and using percentages
	Further percentages

Interpret fractions and percentages as operators	
Activities	
Number - Fractions	Fraction of an Amount
Number - Percentages	Percent of a Number (Mental)
	Calculating Percentages (Mental)
	Percentage Word Problems
Skill Quests	
Fractions & percentages as operators	Interpreting fractions & percentages as operators

Use standard units of mass, length, time, money and other measures, including with decimal quantities	
Activities	
Teacher directed	
Skill Quests	
Use standard units	Using the standard unit of mass
	Using the standard unit of length
	Using the standard unit of time
	Using the standard unit of money

Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]	
Activities	
Number - Estimation & Accuracy	Rounding Numbers
	Rounding Decimals
	Significant Figures
	Rounding Significant Figures
Skill Quests	
Round numbers	Rounding to a specified number of decimal places
	Rounding to a number of significant figures

Use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation $a<x\leq b$	
Activities	
Number - Estimation & Accuracy	Estimation: Add and Subtract
	Estimation: Multiply and Divide
Skill Quests	
Approximation & errors	Using rounding to estimate answers and find errors

Use a calculator and other technologies to calculate results accurately and then interpret them appropriately
Activities
Teacher directed
Skill Quests
Teacher directed

Appreciate the infinite nature of the sets of integers, real and rational numbers	
Activities	
Teacher directed	
Skill Quests	
Sets: integers, real & rational numbers	Sets of integers, real & rational numbers

Algebra

Use and interpret algebraic notation, including: ab in place of $a \times b$, 3y in place of $y + y + y$ and $3 \times y$, a^2 in place of $a \times a$, a^3 in place of $a \times a \times a$; a^2b in place of $a \times a \times b$, a/b in place of $a \div b$, coefficients written as fractions rather than as decimals, brackets	
Activities	
Algebra - Simplifying	Writing Algebraic Expressions
Skill Quests	
Algebraic notation and conventions	Algebraic notation and conventions

Substitute numerical values into formulae and expressions, including scientific formulae	
Activities	
Algebra - Expressions & Formulae	Simple Substitution 1
	Simple Substitution 2
	Simple Substitution 3

	Substitution in Formulae
	Complex Substitution
	More Substitution in Formulae
	Real Formulae
Algebra - Graphing Equations	Function Rules and Tables
Skill Quests	
Substitute values into formulae	Substituting values into expressions and formulae

Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors	
Activities	
Algebra - Simplifying	Recognising Like Terms
Skill Quests	
Understand algebraic vocabulary	Understanding algebraic vocabulary

Simplify and manipulate algebraic expressions to maintain equivalence by: collecting like terms, multiplying a single term over a bracket, taking out common factors, expanding products of 2 or more binomials	
Activities	
Algebra - Simplifying	Like Terms: Add and Subtract
	Simplifying Expressions
	Algebraic Multiplication
	Dividing Expressions
	Factorising
	Factorising Expressions
	Factorising with Indices
	Expand then Simplify
	Algebraic Fractions 1
Skill Quests	
Work with algebraic expressions	Adding and subtracting algebraic expressions
	Multiplying a single term over a bracket
	Taking out common factors
	Expanding products of binomials

Understand and use standard mathematical formulae; rearrange formulae to change the subject	
Activities	
Algebra - Expressions & Formulae	Changing the Subject
Skill Quests	
Understand & manipulate formulae	Understanding & manipulating mathematical formulae

Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs	
Activities	
Teacher directed	
Skill Quests	
Situations as expressions or graphs	Creating algebraic expressions
	Modelling situations using graphs

Use algebraic methods to solve linear equations in 1 variable (including all forms that require rearrangement)	
Activities	
Algebra - Linear Equations	Missing Numbers
	Find the Missing Number 2
	Solve Equations: Add, Subtract 1
	Solve Equations: Multiply, Divide 1
	Solving Simple Equations
	Solve One-Step Equations
	Equations: Variables, Both Sides
	Solve Multi-Step Equations
	Solving More Equations
	Checking Solutions
	Equations to Solve Problems
	Writing Equations
Skill Quests	
Solve linear equations	Solving equations basics
	Solving equations:1-step with addition/subtraction
	Solving equations:1-step with mult/div
	Solving equations:1-step with mixed operations
	Solving equations:2-step with mixed operations
	Solving equations: 3-step with mixed operations
	Solving equations: variables on both sides
	Solving equations: involving brackets

Work with coordinates in all 4 quadrants	
Activities	
Algebra - Graphing Equations	Number Plane
	Ordered Pairs
	Graphing from a Table of Values
	Reading Values from a Line
Skill Quests	
Work with coordinates	Working with coordinates

Recognise, sketch and produce graphs of linear and quadratic functions of 1 variable with appropriate scaling, using equations in x and y and the Cartesian plane	
Activities	
Algebra - Graphing Equations	Horizontal and Vertical Lines
	Direct Linear Variation/y=ax
	Graphing Parabolas
Skill Quests	
Graphs of linear and quadratic functions	Graphs of linear functions with a table of values
	Quadratic functions with a table of values

Interpret mathematical relationships both algebraically and graphically	
Activities	
Teacher directed	
Skill Quests	
Algebraic and graphical relationships	Algebraic and graphical relationships

Reduce a given linear equation in 2 variables to the standard form y = mx + c; calculate and interpret gradients and intercepts of graphs of such linear equations numerically, graphically and algebraically	
Activities	
Algebra - Sequences	Find the Function Rule
Algebra - Graphing Equations	Gradient
	Intercepts
	Which Straight Line?
	Equation of a Line 1
	Modelling Linear Relationships
Skill Quests	
Use the standard form of a line	Understanding the gradient and intercept
	Using the gradient intercept form of a line

Use linear and quadratic graphs to estimate values of y for given values of x and vice versa and to find approximate solutions of simultaneous linear equations	
Activities	
Algebra - Graphing Equations	Simultaneous Linear Equations
Skill Quests	
Use graphs to find solutions	Using graphs to find approximate solutions

Find approximate solutions to contextual problems from given graphs of a variety of functions, including piece-wise linear, exponential and reciprocal graphs	
Activities	
Teacher directed	
Skill Quests	
Solve contextual problems from graphs	Solving contextual problems from graphs

Generate terms of a sequence from either a term-to-term or a position-to-term rule	
Activities	
Algebra - Sequences	Increasing Patterns
	Decreasing Patterns
	Describing Patterns
Skill Quests	
Generate terms of a sequence	Generating terms of a sequence

Recognise arithmetic sequences and find the nth term	
Activities	
Algebra - Sequences	Terms: Arithmetic Progressions
	Linear Expressions for the Nth Term
Skill Quests	
Find the nth term in sequences	Finding the nth term in arithmetic sequences

Recognise geometric sequences and appreciate other sequences that arise
Activities
Teacher directed

Skill Quests	
Work with geometric sequences	Working with geometric sequences

Ratio, Proportion and Rates of Change

Change freely between related standard units [for example time, length, area, volume/capacity, mass]	
Activities	
Ratio, Proportion & Rates of Change	Converting Units of Length
	Kilometre Conversions
	Converting Units of Area
	Converting Volume
	Converting Units of Mass
Skill Quests	
Convert between standard units	Converting between standard units

Use scale factors, scale diagrams and maps	
Activities	
Geometry - Transformations	Scale Factor
Skill Quests	
Use scale factors	Using numerical scale factors
	Using scale factors in ratio form

Express 1 quantity as a fraction of another, where the fraction is less than 1 and greater than 1	
Activities	
Number - Fractions	Fraction Word Problems
Skill Quests	
One quantity as a fraction of another	Expressing one quantity as a fraction of another

Use ratio notation, including reduction to simplest form	
Activities	
Ratio, Proportion & Rates of Change	Ratio
	Equivalent Ratios
Skill Quests	
Understand and simplify ratios	Understanding and simplifying ratios
	Ratios involving fractions and decimals

Divide a given quantity into 2 parts in a given part:part or part:whole ratio; express the division of a quantity into 2 parts as a ratio	
Activities	
Ratio, Proportion & Rates of Change	Dividing a Quantity in a Ratio
Skill Quests	
Solve problems with ratios	Solving problems with ratios

Understand that a multiplicative relationship between 2 quantities can be expressed as a ratio or a fraction
Activities

Teacher directed	
Skill Quests	
Multiplicative relationships as ratios	Multiplicative relationships expressed as a ratio

Relate the language of ratios and the associated calculations to the arithmetic of fractions and to linear functions	
Activities	
Teacher directed	
Skill Quests	
Teacher directed	

Solve problems involving percentage change, including: percentage increase, decrease and original value problems and simple interest in financial mathematics	
Activities	
Number - Percentages	Profit and Loss
	Simple Interest
Skill Quests	
Percentage change and simple interest	Solving problems involving percentage change
	Solving problems involving simple interest

Solve problems involving direct and inverse proportion, including graphical and algebraic representations	
Activities	
Ratio, Proportion & Rates of Change	Solve Proportions
	Rates Calculations
	Rates Word Problems
	Proportional Relationships
Skill Quests	
Solve problems involving proportion	Solving problems involving direct proportion
	Graphing directly proportional relationships
	Solving problems involving indirect proportion
	Problems involving direct & indirect proportion

Use compound units such as speed, unit pricing and density to solve problems	
Activities	
Ratio, Proportion & Rates of Change	Time Taken
Skill Quests	
Solve problems with compound units	Working with compound units
	Solving problems involving speed

Geometry and Measures

Derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders)	
Activities	
Algebra - Expressions & Formulae	Surface Area: Rearrange Formula
	Volume: Rearrange Formula
Geometry - Area & Perimeter	Perimeter: Triangles

	Area: Right Angled Triangles
	Area: Triangles
	Area: Parallelograms
	Area: Quadrilaterals
Geometry - Volume & Surface Area	Volume: Rectangular Prisms 1
	Volume: Triangular Prisms
	Volume: Cylinders
	Volume: Prisms
	Surface Area: Rectangular Prisms
	Surface Area: Triangular Prisms
	Surface Area: Square Pyramids
Skill Quests	
Perimeter of 2-D shapes	Perimeter of 2-D shapes
Area of 2-D shapes	Area of triangles
	Area of rectangles
	Area of parallelograms
	Area of a trapezium
	Area of a rhombus
	Area of a kite
	Area of composite shapes
Volume of 3-D shapes	Volume of prisms
	Volume of cuboids
	Volume of triangular prisms
	Solving problems with prisms
	Volume of cylinders

Calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes	
Activities	
Geometry - Area & Perimeter	Perimeter: Composite Shapes
	Calculate Circumference of Circles
	Area: Composite Shapes
	Area: Circles 1
Skill Quests	
Perimeter of composite 2-D shapes	Perimeters of composite shapes
Circumference of circles	Understanding circles and finding circumference
	Finding perimeters of quadrants and semicircles
	Finding arc lengths and perimeters of sectors
Area of a circle	Finding the area of a circle
	Finding the area of parts of circles

Draw and measure line segments and angles in geometric figures, including interpreting scale drawings	
Activities	
Geometry - Shapes & Angles	Measuring Angles
Geometry - Pythagoras & Trigonometry	Bearings
Skill Quests	
Geometric figures and scale drawings	Line segments, angles, interpreting scale drawings

Derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line

Activities	
Teacher directed	
Skill Quests	
Teacher directed	

Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric	
Activities	
Geometry - Transformations	Rotational Symmetry
	Symmetry or Not?
Skill Quests	
Geometrical conventions and language	Using geometry conventions
	Identifying parallel and perpendicular lines

Use the standard conventions for labelling the sides and angles of triangle ABC, and know and use the criteria for congruence of triangles	
Activities	
Geometry - Transformations	Congruent Triangles
Skill Quests	
Triangle conventions	Using the conventions for angles and triangles
	Understanding criteria for triangle congruence
	Applying properties of congruent triangles

Derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies	
Activities	
Geometry - Shapes & Angles	Plane Figure Theorems
Skill Quests	
Properties of 2-D shapes	Properties of 2-D shapes

Identify properties of, and describe the results of, translations, rotations and reflections applied to given figures	
Activities	
Geometry - Transformations	Rotations: Coordinate Plane
	Transformations
	Transformations: Coordinate Plane
Skill Quests	
Understand transformations	Understanding translations
	Understanding reflections
	Understanding rotations
	Understanding all transformations

Identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids	
Activities	
Geometry - Transformations	Similar Figures
	Similar Triangles
	Congruent Figures (Grid)

	Congruent Figures: Find Values
Skill Quests	
Congruent and similar triangles	Identify and construct congruent triangles
	Construct similar shapes by enlargement

Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles	
Activities	
Geometry - Shapes & Angles	Angles in a Revolution
Skill Quests	
Properties of angle relationships	Properties of angle relationships

Understand and use the relationship between parallel lines and alternate and corresponding angles	
Activities	
Geometry - Shapes & Angles	Parallel Lines
	Angles and Parallel Lines
Skill Quests	
Angle relationships on parallel lines	Angle relationships on parallel lines

Derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons	
Activities	
Geometry - Shapes & Angles	Angle Sum of a Triangle
	Quadrilaterals: Angle Sum with Equations
	Exterior Angles of a Triangle
	Interior Angles
Skill Quests	
Explore the angle sum of a triangle	Exploring the angle sum of a triangle

Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results about angles and sides, including Pythagoras' Theorem, and use known results to obtain simple proofs	
Activities	
Geometry - Pythagoras & Trigonometry	Pythagoras and Perimeter
	Distance Between Two Points
	Hypotenuse, Adjacent, Opposite
Skill Quests	
Teacher directed	

Use Pythagoras' Theorem and trigonometric ratios in similar triangles to solve problems involving right-angled triangles	
Activities	
Geometry - Pythagoras & Trigonometry	Hypotenuse of a Right Triangle
	Pythagoras: Find a Short Side (integers only)
	Pythagoras' Theorem
	Pythagorean Triads
	Sin A
	Cos A
	Tan A
	Find Unknown Angles

	Find Unknown Sides
Skill Quests	
Pythagoras' Theorem	Introducing the Pythagoras' Theorem
	Finding the shorter side using Pythagoras' Theorem
	Finding the hypotenuse using Pythagoras' Theorem
	Solving problems using Pythagoras' Theorem
	Pythagoras' Theorem: Triads and the converse
Trigonometry	Trigonometry introduction
	Trigonometric relationships
	Trigonometry and the calculator
	Using trigonometric ratios to find missing sides
	Using trigonometric ratios to find missing angles
	Solving problems using trigonometry

Use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3-D	
Activities	
Geometry - Shapes & Angles	Properties of Solids
	Relate Shapes and Solids
Skill Quests	
Use properties of 3-D shapes	Using properties of 3-D shapes to solve problems

Interpret mathematical relationships both algebraically and geometrically	
Activities	
Teacher directed	
Skill Quests	
Interpret mathematical relationships	Relationships algebraically and geometrically

Probability

Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale	
Activities	
Probability	Probability Scale
	Simple Probability
	Find the Probability
Skill Quests	
Understand probability	Language and concepts of probability
	Expressing and interpreting probabilities
	Probability experiments

Understand that the probabilities of all possible outcomes sum to 1	
Activities	
Probability	Complementary Events
Skill Quests	
Complementary probabilities	Complementary probabilities

Enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams	
Activities	
Probability	How many Combinations?
	Counting Techniques 1
	Venn Diagram 1
Skill Quests	
Venn diagrams, set theory & 2-way tables	Introducing Venn diagrams
	Using Venn diagrams to solve problems
	Two-way tables
	Venn Diagrams and two-way tables
	Introducing set theory

Generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities	
Activities	
Probability	Dice and Coins
	Probability Tables
Skill Quests	
Sample spaces and probability	Sample spaces and probability

Statistics

Describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers)	
Activities	
Statistics	Data Types
	Mode
	Median
	Mean
	Which Measure of Central Tendency?
	Data Extremes and Range
	Mode from Frequency Table
	Median from Frequency Table
	Mean from Frequency Table
Skill Quests	
Understand data language	Understanding data language
Central tendency & data analysis	Mean, median, mode and range
	Data analysis

Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data	
Activities	
Statistics	Tally Charts
	Pie Charts
	Pie Chart Calculations
	Line Graphs: Interpretation
Skill Quests	

Represent & interpret data displays	Construct and interpret tables and pictograms
	Construct and interpret vertical line charts
	Construct and interpret dot plots
	Construct & interpret ordered stem and leaf plots
	Construct and interpret divided bar graphs
	Construct and interpret pie charts
	Construct and interpret line graphs
	Interpreting data in a variety of forms

Describe simple mathematical relationships between 2 variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs	
Activities	
Statistics	Scatter Plots
Skill Quests	
Bivariate data	Understanding bivariate data
	Understanding scatter graphs

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