

Mathematics Year 10 Higher

Term	1	2	3	4	5	6	
Topic	Number and Geometry 1	Algebra 1	Statistics 1	Ratio	Geometry 2	Statistics 2	Algebra 2
Detail	Exploring the area of a variety of shapes including trapezia, circles, sectors and compound shapes. Understand and apply upper and lower bounds in context. Know, use and apply the formulae for finding the volume and surface area of cylinders, cones, spheres and pyramids.	Apply knowledge of algebra through to solving and creating simultaneous equations involving quadratic equations, including solving quadratic equations by a variety of methods.	Extend current knowledge of probability tree diagrams, Venn diagrams and set notation.	Understand the concepts of direct and inverse proportion and how it is applied to a graph. Understand and apply compound measures into scientific contexts. Investigate multipliers when considering compound interest, growth and decay.	Recall and extend use of Pythagoras' Theorem in both 2D and 3D situations. Develop skills in trigonometry including SIN/CAT/OS, Sine and Cosine rules. Understand and use trigonometric graphs and know some exact values of trigonometric functions. Apply trigonometry into 3D. Identify and prove congruency in triangles.	Draw and interpret cumulative frequency diagrams, box plots and histograms to compare data sets. Understand and perform random sampling, stratified sampling and data collecting using the capture-recapture method.	Revision and extension of expanding brackets to three binomials. Extend inequalities to identifying and describing regions on a graph. Investigate roots and turning points on a quadratic graph and their links with solving and completing the square of quadratic equations.
Grade 8-9	Applying upper and lower bounds.	Solve quadratic equations by completing the square. Create and solve simultaneous equations with one quadratic equation.	Apply upper and lower bounds with right-angled trigonometry. Apply Pythagoras' Theorem and Trigonometry to 3D situations.				Find the coordinates of turning points using completing the square. Reason whether a quadratic equation has no roots, two roots or a repeated root.
Grade 6-7	Perform and describe an enlargement by a negative scale factor.	Solve quadratic equations using the quadratic formula.	Understand and use Venn diagrams and set notation. Use the Venn diagram to find probability.	Use multipliers for compound interest, growth and decay. Calculate rates of change. Create and use formulae for direct and inverse proportion. Use a similarity with areas and volumes of shapes.	Know and use the sine, cosine and tangent graphs. Know and use the Sine and Cosine rules to find an angle or a side.	Describe and interpret cumulative frequency tables and diagrams. Draw and compare plots for data sets. Draw, interpret and compare data represented in a histogram with unequal bar widths.	Represent inequalities on a graph. Identify and describe regions represented by inequalities. Solve a quadratic equation using an iterative process. Expand the product of three binomials.
Grade 5	Write error intervals using inequalities. Find and use the perimeter and area of sectors. Recall and use the formulae for finding the volume and surface area of spheres and pyramids. Solve problems involving volume and surface area. Draw and use 'net' to solve problems.	Factorise expressions up to quadratic expressions. Find the roots or solutions of quadratic functions. Solve simultaneous equations (algebraically). Create and solve linear simultaneous equations.	Create and use probability tree diagrams for dependent events.	Calculate using compound measures such as distance, speed and time, density, mass and volume and pressure, force and area. Convert between units of compound measures. Know the meanings of congruent and similar relating to shapes. Identify and find missing angles in a circle.	Investigate, explore and calculate with right-angled trigonometry. Recall the exact values of sine, cosine, tangent at 0, 30, 45, 60, 90 degrees. Identify and prove congruent triangles (SSS, SAS, AAS, RHS). Use known facts such as angle facts, similarity, congruency and properties of quadrilaterals. To create simple geometric proofs. Explain why the base angles in an isosceles triangle must be equal.	Understand and perform a stratified sample. Find estimates using the capture-recapture model of data collection.	Factorise a quadratic expression in the form $x^2 + bx + c$. Factorise a quadratic expression in the form $x^2 + bx + c$. Explain, reason and prove using expanding and factoring. Create an expression or formula to describe a situation using algebra or factorisation. Sketch and interpret graphs of cubic functions.
Grade 4	Identify upper and lower bounds. Construct triangles using a pair of compasses and a ruler. Construct perpendicular and angle bisectors. Construct a variety of 2D shapes using a ruler and compasses.	Solve linear equations up to two variables on both sides and including expanding brackets. Solve, identify integer solutions and represent inequalities on a number line.	Create and use probability tree diagrams for independent events.	Calculate using compound measures such as distance, speed and time, density, mass and volume and pressure, force and area. Convert between units of compound measures. Know the meanings of congruent and similar relating to shapes. Identify and find missing angles in a circle.	Use and apply Pythagoras' Theorem in a 2D context.	Understand and use random sampling.	Expand and simplify the addition or subtraction of two of more brackets. Multiply two linear expressions of the form $(ax+b)(cx+d)$. Identify two linear expressions of the form $(a + bx)(c + dx)$. Simplify an expression involving x^2 by collecting like terms. Use area of 2D shapes and algebra or proof of identities.
Grade 2-3	Find the area and perimeter of compound shapes including trapezia. Convert between metric units of length, area and volume. Calculate surface area and volume of prisms and cylinders. Recall and use the circumference and area of a circle (including in terms of π). Draw and use plans and elevations. Perform and describe reflections, rotations and translations of 2D shapes. Perform and describe enlargements of a 2D shape using positive and fractional scale factors. Draw and use tables on maps and scale drawings. Draw and solve problems using bearings. Construct triangles using a protractor.	Use outcomes of events and define their probability. Draw and use a simple case diagram. Recall and use the four of mutually exclusive events adding and 2 include use of algebra. Identify events in an experimental probability. Create Venn diagrams.	Recognise direct and inverse proportion through points on a graph.	Draw and understand key vocabulary for sampling.	Draw and understand key vocabulary for sampling.	Draw and understand key vocabulary for sampling.	Draw and understand key vocabulary for sampling.

Keywords	perpendicular bisector, scale factor, congruence, insurance, transformation, rotation, reflection, translation, enlargement, solid, sphere, pyramid, cone, perpendicular, slant, surface area, volume	unknown, solve, solution set, internal, iteration, independent, dependent, substitution, elimination, equivalent, expansion, expand, linear, quadratic, difference of two squares, binomial, factorise, factorising, define, net	outcome, equally likely outcomes, event, independent, dependent, diagrams, random, bias, probability, expectation, set, conditional probability, Venn diagrams	perpendicular bisector, scale factor, similar, congruence, insurance, percentage change, percentage increase, percentage decrease, compound interest, simple interest, growth, decay, exponential	Opposite, adjacent, hypotenuse, trigonometry, function, ratio, sine, cosine, tangent, angle of elevation, angle of depression	algebraical data, discrete data, continuous data, grouped data, area, area, population, sample, cumulative frequency, box plots, central tendency, mean, mode, median, spread, dispersion, consistency range, interquartile range, skewness	linear, inequality, variable, manipulate, solve, solution set, integer, set notation, region
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Resource Links	<p>EM: Enlargement 2</p> <p>EM: Stick on the Maths SSM3: Enlargement (fractional scale factors)</p> <p>NRICH: Growing Rectangles</p>	<p>All-in-one revision: Revision to find your classmate's number (between 1 and 10000) when the only clue is a shape or another algebraic expression. Complete the task.</p> <p>EM: Babylonian square roots – an introduction to iterative processes</p> <p>EM: Stick on the Maths ALG2: Simultaneous linear equations</p> <p>EM: Convicted? ALG2: Simultaneous linear equations</p> <p>NRICH: Matchless</p> <p>AQ4: Bridging Limits: Resource Pocket 4</p> <p>AQ4: Bridging Limits: Resource Pocket 4</p> <p>AQ4: Bridging Limits: Resource Pocket 4</p> <p>EM: Stick on the Maths: Quadratic sequences</p> <p>NRICH: What's possible?</p> <p>NRICH: Finding Factors</p> <p>Algebra Tiles (external link)</p> <p>Learning curve</p> <p>NRICH: How old am I?</p> <p>NRICH: Golden Thoughts</p> <p>Twh: Algebra Faith</p>	<p>GMT: Venn Diagrams</p> <p>EM: Stick on the Maths SSM1: Congruence and similarity</p> <p>EM: Convicted? Congruence and Similarity</p> <p>EM: Convicted? ALG2: Simultaneous linear equations</p> <p>EM: Stick on the Maths S: Repeated Proportional Change</p> <p>EM: Convicted? Repeated Proportional Change</p> <p>EM: Stick on the Maths S: Repeated Proportional Change</p> <p>EM: Stick on the Maths S: Repeated Proportional Change</p> <p>EM: Stick on the Maths S: Repeated Proportional Change</p> <p>EM: Stick on the Maths S: Repeated Proportional Change</p>	<p>EM: Stick on the Maths SSM3: Enlargement (fractional scale factors)</p> <p>EM: Convicted? Congruence and Similarity</p> <p>EM: Convicted? ALG2: Simultaneous linear equations</p> <p>EM: Stick on the Maths S: Repeated Proportional Change</p> <p>EM: Convicted? Congruence and Similarity</p> <p>EM: Convicted? ALG2: Simultaneous linear equations</p> <p>EM: Stick on the Maths S: Repeated Proportional Change</p> <p>EM: Convicted? Congruence and Similarity</p> <p>EM: Convicted? ALG2: Simultaneous linear equations</p> <p>EM: Stick on the Maths S: Repeated Proportional Change</p> <p>EM: Convicted? Congruence and Similarity</p> <p>EM: Convicted? ALG2: Simultaneous linear equations</p> <p>EM: Stick on the Maths S: Repeated Proportional Change</p> <p>EM: Convicted? Congruence and Similarity</p> <p>EM: Convicted? ALG2: Simultaneous linear equations</p>	<p>EM: Stick on the Maths HDL Statistics_102: Comparing Distributions</p> <p>EM: Cumulative Frequency and Box Plots</p> <p>NRICH: The Live of Presidents</p> <p>NRICH: Olympic Triathlon</p> <p>NRICH: Box Plot Match</p> <p>EM: Sampling/Analyzing Data</p>	<p>EM: Linear programming with Lego</p> <p>EM: Linear programming (Autoglyph)</p> <p>EM: Stick on the Maths 8: Inequalities</p> <p>EM: Convicted? Inequalities in two variables</p> <p>NRICH: Which is bigger?</p> <p>EM: How do we know?</p> <p>MAP: Defining regions using inequalities</p> <p>EM: Inequalities</p>
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