

Revision ‘Must Know’ Checklist: Y11 Maths Foundation Tier (Upper)

Below is a checklist of everything you must know to be successful by the end of this year.

Number	Algebra	Geometry and Measures	Ratio and Proportion	Statistics and Probability
<ul style="list-style-type: none"> Evaluate expressions involving squares, cubes and roots (including calculators). Find the LCM and HCF of two numbers by listing. Find the LCM and HCF of two numbers using Venn diagrams of prime factors. Convert between ordinary numbers and standard form. Estimate calculations by rounding numbers to 1 significant figure. Use laws of indices to multiply and divide numbers written in index notation. Find upper and lower bounds when rounding to whole numbers and decimal places. Use inequality notation to specify simple error intervals. 	<ul style="list-style-type: none"> Manipulate and simplify algebraic expressions by collecting ‘like’ terms. Use index notation and laws when multiplying or dividing algebraic terms. Simplify expressions involving brackets. Define a ‘quadratic’ expression. Multiply double brackets/Quadratics. Factorise algebraic expressions by taking out common factors of a single bracket. Substitute positive/negative numbers into an algebraic expressions, formula, and worded formula. Derive a simple formula, including those with squares, cubes, and roots. Rearrange formulae to change the subject using 	<ul style="list-style-type: none"> Solve multi-step angle problems with triangles/quadrilaterals and give reasons for angle calculations. Find missing angles in parallel and intersecting lines. Calculate and use the sums of the interior angles to find missing angles of regular and irregular polygons. Use the sum of the exterior angles of any polygon is 360°. Use the sum of the interior angle and the exterior angle is 180°. Use the perimeter and area of compound shapes made from rectangles and triangles to solve worded/money problems Find the surface area of a prism - Including triangle, trapezia, and 	<ul style="list-style-type: none"> Write a ratio as a fraction. Write ratios in form 1:m or m:1. Compare ratios by upscaling to a common multiple of parts, e.g. Cats:Dogs and Dogs:Fish. Understand and recognise direct/inverse proportion and use to solve problems. Scale up recipes and decide if there is enough of each ingredient. Work out which product is the better buy. Convert between currencies. Solve problems involving Speed, Distance, Time. (mph as well as km/h, include changes of units e.g. m/s). Solve problems involving Density, Mass, Volume, 	<ul style="list-style-type: none"> Calculate the mean, mode, median and range for discrete data. Use information provided to complete a two-way table from a worded problem. Produce and interpret a composite bar chart. Construct pie charts for categorical data and discrete/continuous numerical data. Draw a scatter graph. Comment on the correlation/relationship. Produce a back-to-back stem and leaf diagram. Produce and interpret a line graph for time-series data. Construct histograms with equal class widths.

<ul style="list-style-type: none"> Order simple fractions, decimals, and percentages. Calculate a percentage increase/decrease of a quantity using a multiplier. Calculate percentage change – (including profit/loss). Add and subtract mixed number fractions. Multiply and divide mixed number fractions. Multiply and divide a fraction by an integer, and an integer by a fraction. Calculate an amount using multipliers within compound interest/depreciation problems. Calculate an original amount using multipliers within reverse percentage problems. Divide mixed numbers by whole numbers and vice versa. 	<p>inverse function machines.</p> <ul style="list-style-type: none"> Solve linear equations which contain brackets and those with a negative solution. Write an equation to solve a worded problem. Solve angle or perimeter problems using algebra. Solve linear inequalities with unknowns on both sides. Solve double inequalities and show the solution set on a number line. Find the Nth term of an arithmetic sequence (include increasing and decreasing). Use the Nth term of an arithmetic sequence to generate terms. Find the Nth term for an arithmetic pattern sequence. Continue a quadratic sequence and use the Nth term to generate terms. 	<p>parallelogram cross-sections</p> <ul style="list-style-type: none"> Find the volume of prisms - Including triangle, circle, trapezium, parallelogram, compound shape made from rectangles cross – sections. Convert between metric area measures. Convert between metric volume measures. Convert between metric measures of volume and capacity e.g. $1\text{ml} = 1\text{cm}^3$ or $1\text{L} = 1000\text{cm}^3$. Draw and describe reflections on a coordinate grid using the equation of the line of symmetry. Draw and describe translations using column vectors. Draw and describe rotations about the origin or any other point on a coordinate grid. Draw and describe enlargements on a grid without a centre specified. 	<p>include changes of units.</p> <ul style="list-style-type: none"> Solve problems involving Pressure, Area, Force, include changes of units. 	<ul style="list-style-type: none"> Find the range, averages and recognise the advantages and disadvantages between measures of average Find mean from a discrete/ungrouped frequency table. Find the estimated mean from a continuous/grouped frequency table. Draw a cumulative frequency diagram. Find a missing probability from a list or table using mutually exclusive outcomes. Estimate the number of times an event will occur, given the probability and the number of trials. Work out probabilities from Venn diagrams to represent real-life situations, include 'abstract' sets of numbers/values with union and intersection notation. Use tree diagrams to calculate the probability
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<ul style="list-style-type: none"> Evaluate numbers raised to the power of; zero; simple fractions and powers of a power. Evaluate when written as a negative power. Add and subtract numbers in standard form, with and without a calculator. Multiply and divide numbers in standard form, with and without a calculator. 	<ul style="list-style-type: none"> Plot and draw graphs of straight lines of the form $y = mx + c$ using a table of values. Plot and draw graphs of straight lines in the form $ax + y = c$. Find the equation of a straight line from a graph. Find the equation of the line through one point with a given gradient. Sketch a graph of a linear function, using the gradient and y-intercept. Find and interpret gradient as the rate of change in distance–time and speed–time graphs, graphs of containers filling and emptying, and unit price graphs. Understand the physical significance of area under a speed–time graph. Draw tangents of curves to determine instantaneous gradient. Find the equation of the line through two points when the gradient is not given. 	<ul style="list-style-type: none"> Calculate the area of sectors of circles. Calculate the arc length of sectors of circles. Find the surface area of a cylinder. Calculate the length of a hypotenuse or a shorter side in a right-angled triangle. (Including leaving answers in surd form). Use the trigonometric ratios to find missing sides of right-angles triangles, including real-life 2D problem solving scenarios. Use the trigonometric ratios to find missing angles of right-angles triangles, including real-life 2D problem solving scenarios. Know the exact values of $\sin \theta$ and $\cos \theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ$ and 90°; know the exact value of $\tan \theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ$ and 60°. Use triangles with angles of $30^\circ, 45^\circ$ and 60° 	<ul style="list-style-type: none"> Use tree diagrams to calculate the probability of two dependent events.
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and representing them graphically.

- Find missing lengths, areas, and volumes of shapes using their corresponding figures.