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Year 9: Assessment statements
Subject: Mathematics

	Number & Algebra	Geometry	Probability	Fluency & Problem Solving
Excellence (Indicative of student who will go on to achieve a grade 7-9 at GCSE, if they continue to progress as they are).	• Students solve problems that involve calculating with powers, roots and numbers expressed in standard form. • They evaluate algebraic formulae or calculate one variable, given the others, substituting fractions, decimals, and negative numbers. • They manipulate algebraic formulae, equations, and expressions, finding common factors and multiplying two linear expressions. • In simplifying algebraic expressions, they use rules of indices for negative and fractional values. • They solve inequalities in two variables. • They sketch and interpret graphs of linear, quadratic, cubic and reciprocal functions, and graphs that model real situations.	• Students understand and use congruence and mathematical similarity. • Students can use sine, cosine, and tangent of angles of any size, and Pythagoras' theorem when solving problems in two and three dimensions. • They construct formal geometric proofs. • They can calculate lengths of circular arcs and areas of sectors; and calculate the surface area of cylinders and volumes of cones and spheres. • They appreciate the continuous nature of scales that are used to make measurements (limits of accuracy).	• Students recognise when and how to work with probabilities associated with independent, mutually exclusive events. • They understand how to calculate the probability of a compound event and use this in solving problems. • They understand how the different number of repetitions completed in experimental probability may affect the reliability of conclusions drawn.	• Students are fluent in their times tables up to 15 without using a written process. • They can mentally use the inverse relationship between multiplication and division up to 15 and the written processes for all other numbers including decimals, negatives & fractions. • They show speed and accuracy in completing mental arithmetic and have well developed calculator skills allowing them to complete complex functions in line with the topics covered in the Year 9 curriculum. • They can extract all relevant numerical values from text-based information. • They can independently devise an approach and strategy with which to calculate solutions to problems presented to them. • They demonstrate confidence in being able to prove why an answer is correct. • They set calculations out clearly to show the process derived in their working out. • They always communicate mathematical meaning to different audiences through precise and consistent use of symbols.
Secure (Indicative of student who will go on to achieve a grade 5-6 at GCSE, if they continue to progress as they are).	• Students order and approximate decimals when solving numerical problems and equations. • They understand and use proportional changes, calculating the result of any proportional change using only multiplicative methods. • When making estimates, students round to one significant figure and multiply and divide mentally. • They can evaluate one number as a fraction or percentage of another. • They understand and use the equivalences between fractions, decimals, and percentages. • They formulate and solve linear equations with whole-number coefficients. • They can determine the bounds of intervals (limits of accuracy). • Students can substitute in positive and negative real values into equations to calculate a given total. • They can plot linear, quadratic, cubic and reciprocal functions using Cartesian coordinates and identify the properties of each in turn.	• Students understand & apply Pythagoras' theorem when solving problems in two dimensions. • They can use sine, cosine, and tangent of angles of any size, and Pythagoras' theorem when solving problems in two dimensions. • They recognise and use common 2-D representations of 3-D objects. • They know and use the properties of quadrilaterals. • They solve problems using angle and symmetry, properties of polygons and angle properties of intersecting and parallel lines and can explain these properties. • They understand and use appropriate formulae for finding circumferences and areas of circles, areas of rectilinear figures and volumes of cuboids and prisms. • They enlarge shapes by a fractional scale factor and appreciate the similarity of resulting shapes. • They understand and use compound measures, such as speed and density.	• Students, when solving problems, use their knowledge that the total probability of all the mutually exclusive outcomes of an experiment is 1. • They understand relative frequency as an estimate of probability and use this to compare outcomes of experiments.	• Students are fluent in their times tables up to 12 without using a written process. Students can mentally use the inverse relationship between multiplication and division up to 12 and the written processes for all other numbers including decimals, negatives, and fractions. • They apply the order of operations rules for all calculations. • They are proficient in the use of a scientific calculator when completing calculations in line with the Year 9 curriculum. • They can extract relevant numerical values from text-based information. • They can carry out substantial tasks and solve quite complex problems by independently and systematically breaking them down into smaller, more manageable tasks. • Their written and spoken language explains and informs their use of diagrams. • They begin to give mathematical justifications, making connections between the current situation and situations they have encountered before.

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Year 9: Assessment statements
Subject: Mathematics

Developing (Indicative of student who will go on to achieve a grade 3-4 at GCSE, if they continue to progress as they are).	• Students calculate fractional or percentage parts of quantities and measurements, using a calculator where appropriate. • They construct, express in symbolic form, and use simple formulae involving one or two operations. • They use brackets appropriately. • They can substitute in positive and negative integers into equations to calculate a given total. • They use and interpret coordinates in all four quadrants and plot linear, quadratic, cubic and reciprocal functions.	• Students can identify when to use which sine, cosine, and tangent ratios to find missing angles and sides for right angle triangles and apply this correctly. • They can use Pythagoras' theorem when solving problems for a given right angle triangle. • They make 3-D mathematical models by linking given faces or edges and draw common 2-D shapes in different orientations on grids. • When constructing models and drawing or using shapes, students measure and draw angles to the nearest degree and correctly use language associated with angles. • They can reflect simple shapes in a mirror line. They understand and use the formula for the area of a rectangle. • They know the angle sum of a triangle and that of angles at a point. • They identify all the symmetries of 2D shapes. • They convert one metric unit to another.	• Students can interpret graphs and diagrams, including distance-time graphs, and can draw appropriate conclusions. • They understand and use the probability scale from 0 to 1. • They find and justify probabilities and approximations by selecting and using methods based on equally likely outcomes and experimental evidence, as appropriate. • They understand that different outcomes may result from repeating an experiment.	• Students demonstrate fluency in their times tables up to 12, although this may not be at speed and will require the written process at times and can use this knowledge to support problems involving division. • They use a written process for division calculations and multiplications above 12. • They adhere to the order of operations rules for the vast quantity of calculations. • They can use a scientific calculator when completing calculations in line with the Year 9 curriculum. • They can use a detailed modelled answer to supplement in their own variables to calculate their answer. • They can use a given approach to tackle a problem and draw upon their Mathematical knowledge to apply a given process to solve a problem. • When solving problems, with or without a calculator, they check their results are reasonable by considering the context or the size of the numbers. • They look for patterns and relationships, presenting information and results in a clear and organised way.
Foundation (Indicative of student who will go on to achieve a grade 1-2 at GCSE, if they continue to progress as they are).	• Students choose the appropriate operation when solving addition and subtraction problems. • They use the knowledge that subtraction is the inverse of addition in the context of balancing equations and solving one step problems. • Students can collect like terms to simplify an expression. • Students can plot coordinates in all four quadrants. • They use mental recall of the 2, 3, 4, 5 and 10 multiplication tables and derive the associated division facts. • They solve whole-number problems involving multiplication or division, including those that give rise to remainders. • They use simple fractions that are several parts of a whole and recognise when two simple fractions are equivalent.	• Students use mathematical names for common 3-D and 2-D shapes and describe their properties, including numbers of sides and corners. • They identify mathematical properties of 2D shapes such as reflective and rotational symmetry. • They use non-standard units, standard metric units of length, capacity and mass, and standard units of time, in a range of contexts. • They understand angle as a measurement of turn and recognise right angles in turns. • They can label all sides of a right-angle triangle required to tackle Pythagoras theorem problems and trigonometry problems.	• Students can describe the findings from distance-time graphs and can draw appropriate conclusions for individual sections. • They extract and interpret information presented in simple tables and lists. • They understand the probability scale operates from 0 to 1. • They can find probabilities for given independent events.	• Students can multiply a single digit by a double-digit number up to 12 without using a written process but will resort to column multiplication when unsure. • They use a written process for division calculations. • They understand the rules of order of operations but do not always adhere to them. • Student mental arithmetic is limited to basic one step calculations involving addition or subtraction. • They can use a scientific calculator with guidance when completing calculations in line with the Year 9 curriculum. • They require considerable support in extracting information from questions and in formulating a strategy with which to conduct calculations. • They make extensive use of modelled answers as templates on which to construct their own answers but are unable to adapt these to calculations which do not follow exactly the same information.