Key Stage 3 Subject Assessment Grid			
Subject: **Maths** Year: **8** **AUTUMN 1 – Place value; Addition and Subtraction; Angle sums**			
KS4 target direction	**4**	**6**	**8 (9)**
Advanced	Enrichment/extension – reaching, or part of, next pathway	Enrichment/extension – reaching, or part of, next pathway	Enrichment/extension
Secure *Students must achieve competence in **all highlighted** statements before being judged 'Secure'*	**Secure** The student can: Order positive and negative decimals (including numbers with a differing number of decimal places) Round decimals to 2 decimal places Add and subtract integers and decimals of any size (including negatives and numbers with a differing number of decimal places) Calculate and use the perimeter of any shape Know and use angles in a quadrilateral Identify alternate and corresponding angles Solve geometrical problems using alternate and corresponding angles justifying answers	**Secure** The student can: Order any set of numbers (including those written in standard form) **Round decimals to an appropriate degree of accuracy (including significant figures)** Use positive and negative numbers of any size, the laws of arithmetic and inverse operations **Add and subtract numbers written in standard form** Solve problems involving perimeter (considering upper and lower bounds) Know and use properties of angles, parallel and intersecting lines, triangles and other polygons **Know and use interior and exterior angle sums** Solve geometric problems using step-by-step reasoning	**Secure** The student can: Convert between ordinary and standard index form representations. Recognise that measurements given to the nearest whole unit may be inaccurate by up to one half of the unit in either direction Make and justify estimates and approximations of calculations by rounding numbers to one significant figure Explore the language of proof using algebraic expressions for odd and even numbers; Express an algebraic number of the form 'abc' as '100a+10b+c' Work on proofs involving addition and subtraction (e.g. 'show that abc-bca = 99k') Communicate the solution to a problem involving measurement, explaining the limitations of accuracy using upper and lower bounds Solve problems involving perimeter of compound shapes (including circles) Use inequality notation to specify simple error intervals due to truncation or rounding (in context) Explore degrees of accuracy with multiplication and division problems Prove rules for interior and exterior angle sums

			Solve multi-step problems using properties of angles, of parallel lines, and of triangles and other polygons, justifying inferences and explaining reasoning with diagrams and text.
Developing	Mostly secure – one or more gaps	Mostly secure – one or more gaps	Mostly secure – one or more gaps
Foundation	Significant gaps	Significant gaps	Significant gaps

Subject: **Maths** Year: **8** **AUT 2 – Multiplication and Division; Multiples and factors; Applications**			
KS4 target direction	**4**	**6**	**8 (9)**
Advanced	Enrichment/extension – reaching, or part of, next pathway	Enrichment/extension – reaching, or part of, next pathway	Enrichment/extension
Secure *Students must achieve competence in **all highlighted** statements before being judged 'Secure'*	**Secure** The student can: Understand the effect of multiplying and dividing numbers by values between 0 and 1 Know and apply BIDMAS (including indices) Use squares, positive and negative square roots, cubes and cube roots, and index notation for small positive integer powers Find the prime factorisation of a number Derive and use formula for the area of a triangle, parallelogram and trapezium Calculate areas of compound shapes **Find the volume and surface area of cuboids** Know rough metric equivalents of imperial measures	**Secure** The student can: Use positive and negative numbers of any size, the laws of arithmetic and inverse operations (including multiplying and dividing decimals by decimals) **Use index notation for integer powers; know and use the index laws for multiplication and division of positive integer powers** Estimate square roots Use the prime factorisation of a number Convert between length and area measures Solve problems involving area of compound shapes **Find the circumference and area of circles (simple)** Find the volume and surface area of prisms Explore conversions between units of length, area and volume	**Secure** The student can: Explore proofs involving multiplication and division Use positive and negative numbers of any size, the laws of arithmetic and inverse operations for all numbers (including algebraic expressions) Examine and extend the index laws to establish the meaning of negative, fractional and zero powers, including use of surd notation; Simplify surds; Arithmetic with surds Estimate cube roots Find the (circumference and) area of a circle (to dp and in terms of pi) Find the lengths of arcs and areas of sectors Solve problems involving area of compound shapes (including circles) Find the volume and surface area of prisms Present a concise reasoned argument to derive formulae for lengths of arcs, and areas of sectors Present a concise reasoned argument to derive formulae for surface area and volume of a cylinder Convert between units of length, area and volume
Developing	Mostly secure – one or more gaps	Mostly secure – one or more gaps	Mostly secure – one or more gaps
Foundation	Significant gaps	Significant gaps	Significant gaps

Subject: **Maths** Year: **8** **SPRING 1 – Fractions; Percentages; Applications (Probability)**			
KS4 target direction	**4**	**6**	**8 (9)**
Advanced	Enrichment/extension – reaching, or part of, next pathway	Enrichment/extension – reaching, or part of, next pathway	Enrichment/extension
Secure *Students must achieve competence in all highlighted statements before being judged 'Secure'*	**Secure** The student can: • Order fractions by writing as equivalents or converting into decimals • Multiply and divide fractions • Add and subtract fractions • Use division to convert a fraction to a decimal • Increase and decrease and amount by a given percentage • Interpret results of an experiment using the language of probability and appreciate that random processes are unpredictable • Know that, if the probability of an event occurring is *p*, then the probability of it not occurring is 1 – *p* • Use diagrams and tables to record all possible mutually exclusive outcomes for single events and for two successive events • Compare estimated experimental probabilities with theoretical probabilities	**Secure** The student can: • Simplify or transform algebraic fractions by taking out common factors • Multiply and divide simple algebraic fractions • Add and subtract simple algebraic fractions • Convert recurring decimals into fractions • Increase and decrease an amount by a given percentage or fraction • Use multipliers for percentage change • Know that the sum of probabilities of all mutually exclusive outcomes is 1 and use this when solving problems • Know that, if the probability of an event occurring is p, then the probability of it not occurring is 1 – p • Use lists and tables to record all possible mutually exclusive outcomes for single events and for two successive events • Use a numerical scale from 0 to 1 to express and compare experimental and theoretical probabilities in a range of contexts.	**Secure** The student can: • Distinguish between fractions with denominators that have only prime factors 2 or 5 (terminating decimals), and other fractions (recurring decimals) • Simplify algebraic fractions • Know when to add or multiply two probabilities: if A and B are mutually exclusive, then the probability of A or B occurring is P(A) + P(B), whereas if A and B are independent events, the probability of A and B occurring is P(A) × P(B) • Understand relative frequency as an estimate of probability and use this to compare outcomes of experiments. • Use tree diagrams to represent outcomes of two or more events and to calculate probabilities of combinations of independent events
Developing	Mostly secure – one or more gaps	Mostly secure – one or more gaps	Mostly secure – one or more gaps
Foundation	Significant gaps	Significant gaps	Significant gaps

Subject: **Maths** Year: **8** **SPR 2 – Ratio and Proportion; Data Analysis**			
KS4 target direction	**4**	**6**	**8 (9)**
Advanced	Enrichment/extension – reaching, or part of, next pathway	Enrichment/extension – reaching, or part of, next pathway	Enrichment/extension
Secure *Students must achieve competence in **all highlighted** statements before being judged 'Secure'*	**Secure** The student can: • Use the unitary method to solve problems involving ratio and direct proportion • Divide a quantity into two or more parts given a ratio • Apply understanding of link between ratio and proportion • Use appropriate graphical representation involving discrete, continuous and grouped data • Use appropriate measures of central tendency (median, mean, mode and modal class) and spread (range, including consideration of outliers) • Apply statistics to describe a population	**Secure** The student can: • Use proportional reasoning to solve problems, choosing the correct numbers to take as 100%, or as a whole • Compare two ratios • Simplify ratios, recognising links with fraction notation • Calculate ratios in a range of contexts • Recognise when fractions or percentages are needing to compare proportions • Extend mental methods of calculation with fractions, percentages and ratios • Interpret and construct tables, charts and diagrams, including frequency tables, bar charts, pie charts and pictograms for categorical data, line charts for ungrouped discrete numerical data, tables and line graphs time series data and know their appropriate use • Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through use of appropriate graphical representation involving discrete, continuous and grouped data • Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through use of appropriate measures of central tendency	Secure The student can: • Understand and apply Pythagoras' theorem when solving problems in 2D and simple problems in 3D • Know the exact values for sin x cos X and tan x for 0, 30, 45, 60 and 90 degrees • Understand and use trigonometric relationships in right-angled triangles, and use these to solve problems, including those involving bearings • Understand and use proportionality and calculate the result of any proportional change using multiplicative methods • Understand and use measures of compound measures speed, density and pressure and solve problems involving constant or average rates of change. • Use a range of statistical methods to explore and summarise data, including estimating and finding the mean and median for large data sets • Interpret and draw frequency polygons • Interpret and draw scatter diagrams and lines of best fit • Use appropriate measures of central tendency (median, mean, mode and modal class) and spread (range, including consideration of outliers)

		(median, mean, mode and modal class) and spread (range, including consideration of outliers)	
Developing	Mostly secure – one or more gaps	Mostly secure – one or more gaps	Mostly secure – one or more gaps
Foundation	Significant gaps	Significant gaps	Significant gaps

Subject: **Maths** Year: **8** **SUM 1 – Sequences; Algebraic Expressions and manipulation; Linear Graphs**			
KS4 target direction	**4**	**6**	**8 (9)**
Advanced	Enrichment/extension – reaching, or part of, next pathway	Enrichment/extension – reaching, or part of, next pathway	Enrichment/extension
Secure *Students must achieve competence in **all highlighted** statements before being judged 'Secure'*	Secure The student can: • Generate terms of a linear sequence using term-to-term and position-to-term rules • Explore iterative sequences • Use linear expressions to describe the *n*th term of a simple arithmetic sequence • Relate linear sequences to linear functions • Use index notation for small positive integer powers • Simplify or transform linear expressions by collecting like terms • Understand that algebraic operations, including the use of brackets, follow the rules of arithmetic • Multiply a single term over a bracket (positive and negative integers) • Derive simple formulae and in simple cases change subject. Construct and solve linear equations with integer coefficients (unknown on one side). • Substitute positive integers into expressions involving small powers • Use formulae from mathematics and other subjects	Secure The student can: • Generate terms of a linear sequence using term-to-term and position-to-term rules • Use linear expressions to describe the nth term of as simple arithmetic sequence • Explore quadratic sequences • Simplify or transform algebraic expressions by taking out single-term common factors • Add simple algebraic fractions • Expand two brackets to form a quadratic expression • Work with general iterative processes e.g. use systematic trial and improvement methods to find approximate solutions of equations such as $x^3 + x = 20$. • Construct and solve linear equations with integer coefficients (unknown on one or both sides, without and with brackets) • Substitute numbers into expressions and formulae • Change the subject of simple formulae • Generate points and plot graphs of linear functions given explicitly (y given in terms of x) and implicitly (*y* given	Secure The student can: • Develop, compare and evaluate algebraic and spatial representations of situations that generate sequences • Interpret, deduce and justify generalisations for the nth term of linear and quadratic sequences, including the properties of square and triangle numbers. • Find the inverse of a linear function • Construct linear equations and simple linear inequalities (one variable) to represent real-life situations or mathematical problems; • Solve linear equations and inequalities representing the solution in the context of the problem • Construct and solve linear equations with integer coefficients (with and without brackets, negative signs anywhere in the equation, positive or negative solution) • Simplify algebraic fractions • Use formulae from mathematics and other subjects ; substitute numbers into expressions and formulae; derive a formula and in simple cases, change its subject

	• Generate points in all four quadrants and plot graphs of linear functions (*y* given explicitly in terms of *x*), on paper and using ICT • Recognise that equations of the form $y = mx + c$ correspond to straight-line graphs • Discuss and interpret graphs arising from real situations. • Understand and use measures of compound measures speed, density and pressure and solve problems involving constant or average rates of change.	implicitly in terms of *x*, e.g. $ay + bx = 0$, $y + bx + c = 0$) • Find the gradient of lines given by equations of the form $y = mx + c$ • Represent and solve problems involving constant or average rates of change graphically • Find the midpoint of the line segment AB, given the coordinates of points A and B	• Solve quadratic equations of the form $x^2 + b\,x + c = 0$ by factorisation, graphically or by iterative, e.g. trial and improvement, methods • Generate points in all four quadrants and plot the graphs of the linear functions, where y is given explicity in terms of x, recognise that equations of the form y=mx+c correspond to straight-line graphs • Investigate the gradients of parallel lines and lines perpendicular to these lines
Developing	Mostly secure – one or more gaps	Mostly secure – one or more gaps	Mostly secure – one or more gaps
Foundation	Significant gaps	Significant gaps	Significant gaps

Key Stage 3 Subject Assessment Grid			
Subject: **Maths** Year: **8** **SUM 2 – Transformations; Constructions**			
KS4 target direction	**4**	**6**	**8 (9)**
Advanced	Enrichment/extension – reaching, or part of, next pathway	Enrichment/extension – reaching, or part of, next pathway	Enrichment/extension
Secure *Students must achieve competence in **all highlighted** statements before being judged 'Secure'*	Secure The student can: • Identify all the symmetries of 2D shapes • Transform 2D shapes by rotation, reflection and translation and try out mathematical representations of simple combinations of these transformations • Enlarge 2D shapes, given a centre of enlargement and a positive integer scale factor, and explore enlargement using ICT. • Construct the midpoint and perpendicular bisector of a line segment • Construct the bisector of an angle • Construct the perpendicular from a point to a line • Use ruler and compasses to construct a triangle, given the lengths of the three sides (SSS) • Find simple loci to produce shapes and paths. • Make scale drawings	Secure The student can: • Identify reflection symmetry in 3D shapes • Use a coordinate grid to solve problems involving translations, rotations, reflections and enlargements • Recognise that translations, rotations and reflections preserve length and angle, and map objects onto congruent images • Explore and compare combinations of translations, reflections and rotations of 2D shapes • Enlarge 2D shapes, given a centre of enlargement and a positive integer scale factor, identifying the scale factor as the ratio of the lengths of any two corresponding line segments • Recognise that enlargements preserve angle but not length • Construct the perpendicular from a point to a line • Construct the perpendicular to a line from a point on the line	Secure The student can: • Transform 2D shapes by combinations of translations, rotations and reflections • Use congruence to show that translations, rotations and reflections preserve length and angle • Measure the angle of rotation, using fractions of a turn or degrees • Use any point as the centre of rotation • Enlarge 2D shapes using positive, fractional and negative scale factors recognising the similarity of the resulting shapes • Calculate the length of AB, given coordinates of points A and B • Find the point that divides a line in a given ratio, using properties of similar triangles • Know that if two 2D shapes are similar, corresponding angles are equal and corresponding sides are in the same ratio

	• Use bearings to specify direction	• Construct triangles, given right angle, hypotenuse and side (RHS) • Construct triangles and other 2D shapes • Find a simple locus • Use and interpret maps and scale drawings.	• Understand and use the effects of enlargement on perimeter • Construct bisectors of angles and perpendicular bisectors of line segments. • Understand from experience of constructing them that triangles given SSS, SAS, ASA or RHS are unique, but that triangles given SSA or AAA are not • Find the locus of a point that moves according to a more complex rule • Problem solve using loci, maps and scale drawings.
Developing	Mostly secure – one or more gaps	Mostly secure – one or more gaps	Mostly secure – one or more gaps
Foundation	Significant gaps	Significant gaps	Significant gaps