

Topic	KS3 Maths Age Related Expectation: Year 7		
	Working Towards	Age related	Working beyond
Number skills	☐ Round whole numbers to the nearest 10, 100, 1000. ☐ Multiply whole numbers using a written method.	☐ Carry out calculations involving brackets. ☐ Solve problems involving time and money using a calculator. ☐ Order positive and negative numbers. ☐ Add and subtract positive and negative numbers. ☐ Add, subtract, multiply and divide negative numbers. ☐ Recognise and use square numbers, square roots and triangle numbers.	☐ Find the HCF and LCM of two numbers. ☐ Add, subtract, multiply and divide positive and negative numbers. ☐ Carry out calculations involving squares, cubes, square roots and cube roots. ☐ Estimate answers to complex calculations.
Decimals and measures	☐ Measure and draw lines to the nearest millimetre. ☐ Interpret the display of a calculator in different contexts.	☐ Round to decimal places. ☐ Add and subtract decimals. ☐ Multiply a decimal by an integer. ☐ Divide a decimal by a whole number. ☐ Write decimals in order of size. ☐ Round decimals to the nearest whole number and to one decimal place. ☐ Solve perimeter problems. ☐ Convert between metric units of length, mass and capacity.	☐ Compare different proportions using percentages. ☐ Calculate percentage increases and decreases. ☐ Work backwards to solve a percentage problem. ☐ Multiply decimals mentally. Solve problems involving area.
Fractions	☐ Add and subtract simple fractions. Understand percentage as ‘the number of parts per 100’.	☐ Compare and simplify fractions. Add and subtract fractions. Work with equivalent fractions, decimals and percentages. ☐ Compare simple fractions. ☐ Simplify fractions by cancelling common factors. ☐ Calculate simple fractions of quantities. ☐ Work with equivalent fractions and decimals. ☐ Use different strategies to calculate with percentages.	☐ Add and subtract mixed numbers. ☐ Multiply and divide a mixed number.
Equations, functions and formulae	☐ Find outputs of simple functions written in words and using symbols. ☐ Substitute positive integers into simple formulae written in words.	☐ Simplify expressions by collecting like terms. ☐ Substitute into formulae. ☐ Simplify simple algebraic expressions by collecting like terms. ☐ Write simple formulae using letter symbols.	☐ Derive formulae from a description. ☐ Expand expressions involving brackets. ☐ Factorise an algebraic expression. ☐ Simplify more complicated expressions by collecting like terms.
Equations	☐ Find the input and output for simple function machines	☐ Write and solve simple equations. ☐ Use function machines to solve one step and two steps equations.	☐ Solve problems using equations. ☐ Write and solve equations that have brackets. ☐ Write and solve equations with letters on both sides. ☐ Solve equations that include x^2 and x^3
Sequences and Graphs	☐ Revisit sequences including term- to-term rules. ☐ Read, generate and plot coordinates.	☐ Recognise straight-line graphs parallel to the axes. ☐ Generate sequences from practical sequences, describing how patterns grow. ☐ Begin to identify and use position-to- term rules. ☐ Generate coordinates that satisfy a simple linear rule and plot the graph in the first quadrant.	☐ Write the nth term of a sequence using algebra. ☐ Work out a given term in a simple arithmetic sequence. ☐ Work out the midpoint of a line segment. ☐ Recognise geometric sequences and work out the term-to-term rule. ☐ Draw straight-line graphs.

Angles and Shapes	☐ Use the rule for the sum of angles in a triangle.	☐ Describe the line and rotational symmetry of triangles. ☐ Use the properties of isosceles and equilateral triangles to solve problems. ☐ Use a protractor to measure and draw angles. ☐ Use the rule for angles on a straight line, angles around a point and vertically opposite angles. ☐ Solve angle problems involving quadrilaterals. ☐ Solve complex angles problems.	☐ Work out unknown angles involving parallel lines. ☐ Understand how to prove that a result is true. ☐ Work out the interior and exterior angles of a polygon. ☐ Use a ruler and protractor to draw triangles accurately. ☐ Use known facts to obtain simple proofs.
Perimeter, area and volume	☐ Identify and name 2D shapes.	☐ Recognise types of triangles and quadrilaterals. ☐ Identify polygons up to a decagon. ☐ Calculate the area of 2D shapes. Calculate the perimeter of shapes made from rectangles and triangles. Know the properties of 3D shapes.	☐ Calculate the area of shapes made from rectangles and triangles. ☐ Calculate the surface area of a cuboid. ☐ Convert between different units of volume: cm^3 , ml and litres ☐ Make conclusions based on the results of an experiment.
Calculating with fractions, decimals and percentages	☐ Add and subtract fractions with the same denominator	☐ Add and subtract fractions with any size denominator. ☐ Understand and use of equivalent fractions ☐ Add and subtract improper fractions and mixed numbers ☐ Use fractions in algebraic contexts ☐ Use equivalence to add and subtract decimals and fractions.	☐ Recognise fractional equivalents to important recurring decimals. ☐ Change a recurring decimal into a fraction. ☐ Add and subtract simple algebraic fractions ☐ Calculate percentage change ☐ Work out an original quantity before a percentage increase or decrease. ☐ Calculate the effect of repeated percentage changes.
Statistics, graphs and charts	☐ Interpret simple bar charts. ☐ Find the mode, median and range from a list of data.	☐ Solve problems using the mean. ☐ Solve problems with frequency trees ☐ Solve problems with bar charts and line charts. ☐ Interpret simple pie charts.	☐ Plot straight-line graphs. ☐ Find the gradient of a straight-line graph. ☐ Plot graphs using the gradient and y-intercept. ☐ Find the equation of a straight-line graph. ☐ Identify parallel and perpendicular lines. ☐ Plot and use non-linear graphs. ☐ Calculate angles and draw pie charts.

Topic	KS3 Maths Age Related Expectation: Year 8		
	Working Towards	Working at	Working beyond
Number - factors and powers and working with powers	☐ Add subtract multiply and divide positive numbers. ☐ Calculate using squares and cubes.	☐ Use the laws of indices for multiplying and dividing. ☐ Understand the effect of multiplying and dividing by any integer power of 10. ☐ Covert between numbers in standard form and ordinary numbers. ☐ Calculate with numbers in standard form ☐ Calculate with powers. ☐ Round to a number of significant figures. ☐ Simplify expressions involving powers and brackets. ☐ Substitute integers into expressions. ☐ Estimate answers to calculations. ☐ Calculate square and cube roots. ☐ Use mental methods to calculate combinations of powers roots and brackets.	☐ Use prime factor decomposition to find the HCF and LCM. ☐ Use the index laws in algebraic calculations and expressions. ☐ Write and simplify expressions involving brackets and powers. ☐ Factorise an algebraic expression. ☐ Understand and use negative indices. ☐ Understand and use fractional indices. ☐ Use prime factor decomposition to find the HCF or LCM or two numbers.
	☐ Reduce a ratio to its simplest form.	☐ Share a quantity in 2 or more parts in a given ratio. ☐ Use the unitary method to solve simple word problems involving direct proportion. ☐ Solve simple word problems involving ratio and direct proportion. ☐ Use percentages to compare simple proportions. ☐ Explore conversion graphs. ☐ Convert between currencies.	☐ Convert between metric and imperial units. ☐ Solve simple word problems involving ratio and direct proportion. ☐ Solve simple word problems involving ratio and inverse proportion. ☐ Solve problems involving ratio and proportion using the unitary method. ☐ Solve best buy problems. ☐ Explore direct proportion graphs.
Percentages, decimals and fractions	☐ Recognise equivalent fractions.	☐ Recognise recurring and terminating decimals. ☐ Use the equivalence of fractions, decimals and percentages to compare proportions. ☐ Find simple fraction of amounts with and without calculator ☐ Calculate percentage change. ☐ Find simple percentages of amounts with and without calculator ☐ Use strategies for dividing fractions. ☐ Find the reciprocal of a number.	☐ Work out percentage increase and decrease. ☐ Solve problems with fractions greater than 1 and percentages greater than 100%.
Calculating with fractions, decimals and percentages	☐ Use appropriate methods for multiplying fractions. ☐ Add and subtract fractions with the same denominator	☐ Find a fraction and percentage of a given amount. ☐ Calculate percentage change. ☐ Add and subtract fractions with any size denominator. ☐ Use strategies for dividing fractions. ☐ Find the reciprocal of a number.	☐ Recognise fractional equivalents to important recurring decimals. ☐ Change a recurring decimal into a fraction. ☐ Work out an original quantity before a percentage increase or decrease. ☐ Calculate the effect of repeated percentage changes.
Decimals and ratio	☐ Use ratios involving decimals.	☐ Use the symbols > and < between two negative decimals.	☐ Multiply decimals with up to two decimal places. ☐ Multiply and divide by decimals. ☐ Solve proportion problems involving decimals.
Scale Drawings and Measures	☐ Understand scale factors as multiplicative representation.	☐ Use and interpret maps. ☐ Use similarity to solve problems in 2D shapes.	☐ Draw diagrams to scale using bearings. ☐ Use and interpret scale drawings. ☐ Use congruence to solve problems in triangles and quadrilaterals.

Statistics, graphs and charts	☐ Interpret simple bar charts. ☐ Find the mode median and range from a list of data.	☐ Calculate the mean from a simple frequency table. ☐ Draw and interpret scatter graphs ☐ Describe types of correlation. ☐ Draw and interpret the line of best fit. ☐ Read and interpret ungrouped and grouped frequency tables. ☐ Identify different types of data ☐ Construct and interpret two-way tables	☐ Plot straight-line graphs. ☐ Find the gradient of a straight-line graph. ☐ Plot graphs using the gradient and y-intercept. ☐ Find the equation of a straight-line graph. ☐ Identify parallel and perpendicular lines. ☐ Plot and use non-linear graphs. ☐ Calculate angles and draw pie charts.
Straight line graphs	☐ Be able to plot coordinates in all 4 quadrants	☐ Plot straight line graphs. Find the gradient of a straight line Link graphs to linear sequences. Recognising when values are in direct proportion.	☐ Plot a straight-line graph and work out its gradient. ☐ ☐ Find midpoints of line segments. ☐ Explore non-linear graphs
Real life graphs	☐ Interpret line graphs. ☐ Draw and interpret line graphs.	☐ Recognise when values are in direct proportion. ☐ Plot graphs and read values to solve problems. ☐ Interpret distance-time graphs. ☐ Describe trends and make predictions based on information presented graphically.	☐ Draw and interpret distance–time graphs. ☐ Interpret real-life graphs.
Lines and angles	☐ Use angle facts to work out missing angles.	☐ Using alternate angles to find unknown angles. ☐ Identifying corresponding angles.	☐ Solving geometrical problems using side and angle properties of triangles and quadrilaterals. ☐ Calculate the sum of the interior and exterior angles of a polygon.
Area of 2D shapes	☐ Calculate the areas of rectangles, parallelograms and triangles. ☐	☐ Calculate the area of trapezium ☐ Calculate the circumference. ☐ Calculate the area of a circle. ☐ Find areas of compound shapes.	☐ Calculate the surface area of prisms. ☐ Calculate the volume and surface area of a cylinder. ☐ Use Pythagoras' theorem in right-angled triangles.
Constructions and loci		☐ Draw triangles accurately using a ruler and protractor. ☐ Construct triangles using a ruler and compasses.	☐ Bisect a line using a ruler and compasses. ☐ Bisect angles using a ruler and compasses. ☐ Use loci to solve problems.
Transformations	☐ Recognise line of symmetry	☐ Reflect a shape in the horizontal and vertical line Reflect a shape in a diagonal line	☐ Describe and carry out translations. ☐ Describe and carry out reflections. ☐ Describe and carry out rotations. ☐ Enlarge a shape. ☐ Transform 2D shapes using a combination of reflection, rotation, enlargement and translation.
Expressions and equations	☐ Collect like terms to simplify equations ☐ Identify formulae, expressions, identities and equations.	☐ Expand brackets. ☐ Solve real life problems using equations. ☐ Solve equations including with brackets. ☐ Form and solve inequalities. ☐ Identify and use formulae, expressions, identities and equations.	☐ Understand and simplify algebraic powers. ☐ Simplify expressions involving brackets, use rules for indices and factorise expressions.
Probability	☐ Know and use the vocabulary of probability. ☐ Generate sample spaces for single events. ☐ Calculate probability of a single event.	☐ Calculate and compare probabilities. ☐ Construct sample space diagrams for one or more events. ☐ Find probabilities from a sample space, two-way tables and Venn diagrams. ☐ Use product rule for counting for finding the total number of possible outcomes.	☐ Find the probabilities of mutually exclusive outcomes and events. ☐ Use relative frequency to estimate the probability of an event. ☐ Estimate probability using data from an experiment. ☐ Work out the expected results when an experiment is repeated.

Topic	KS3 Maths Age Related Expectation: Year 9		
	Working Towards	Working at	Working beyond
Number	☐ Rounding to different degrees of accuracy. ☐ Manipulating decimal numbers - adding, subtracting, multiplying and dividing. ☐ Finding square and cube roots and recognising powers.	☐ Work out the total number of ways of performing a series of tasks. ☐ Estimate answers to calculation as well as using one calculation to find the answer to another. ☐ Solve problems with integers, decimals and fractions ☐ Write a number as the product of its prime factors. ☐ Use prime factor decomposition and Venn diagrams to find the HCF and LCM. ☐ Understand and use index laws. ☐ Write numbers and perform calculations using standard form. ☐ Understand the difference between irrational and rational numbers.	☐ Use negative and fractional indices. ☐ Simplify a surd. ☐ Rationalise the denominator.
Fractions, ratio, decimals and percentages		☐ Work with fractions to include, adding, subtracting, multiplying, dividing and comparing. ☐ Find a fraction and percentage of an amount or quantity. ☐ Use decimals to find quantities. ☐ Convert between fractions, decimals and percentages. ☐ Calculate simple interest, VAT as well as percentage increases and decreases. ☐ Compare ratios and finding quantities using ratios. ☐ Recognise and use direct proportion. ☐ Work out percentage increases and decreases. ☐ Solve reverse percentages problems. ☐ Calculate simple and compound interests. ☐ Solve problems with VAT, wages and taxes. ☐ Solve unit pricing problems.	☐ Write ratios in the form 1:n or n:1 ☐ Solve problems involving ratio and proportion ☐ Solve real life problems involving percentages.
Ratio and proportion	☐ Recognising direct and inverse proportion	☐ Solve problems with direct and inverse proportion ☐ Solve best buys problems.	☐ Graphs of inverse proportion ☐ Solve problems with ratio and algebra.
Algebra	☐ Know the difference between an expression, equation, a formula and an identity. ☐ Write and simplify expressions. ☐ Substitute numbers into expressions and formulae. ☐ Expand brackets. ☐ Represent inequalities on a number line. ☐ Recognise and extend sequences.	☐ Use rules of indices to simplify algebraic expressions. ☐ Expand single brackets and the product of two brackets. ☐ Factorise algebraic expressions including quadratic expressions. ☐ Use the difference of two squares. ☐ Substitute and rearrange formulae. ☐ Find a general formula for the nth term of an arithmetic sequence. ☐ Determine whether a particular number is a term of a given arithmetic sequence. ☐ Work out the terms in a Fibonacci-like sequence.	☐ Solve problems using geometric sequences. ☐ Find the nth term of a quadratic sequence.

Angles and trigonometry	☐ Identify congruent shapes. ☐ Understand and use the angle properties of parallel lines.	☐ Solve angle problems in triangles and quadrilaterals. ☐ Calculate interior and exterior angles of regular polygons. ☐ Solve angle problems using chains of reasoning. ☐ Understand and use Pythagoras' Theorem. ☐ Use trigonometric ratios to calculate lengths and angles of a right angled triangle.	☐ Find angles of elevations and depression. ☐ Use Pythagoras theorem in 3D shapes ☐ Know the exact angles of the sine, cosine and tangent of some angles ☐ Use trigonometric ratios to solve problems. ☐ Solve problems with similar triangles
Perimeter and area	☐ Calculate the perimeter and area of rectangles, triangles, parallelograms and trapeziums. ☐ Calculate surface area and volume of cuboids and prisms.	☐ Find perimeter and area of compound shapes. ☐ Calculate the area and circumference of a circle, semi-circle and quarter circles. ☐ Convert between metric units of area and volume.	☐ Solve problems involving volumes and surface areas of prisms, cylinders, spheres, pyramids and cones. ☐ Calculate arc lengths, angles and areas of sectors.
Transformations, bearings and constructions	☐ Recognise and describe 3D shapes using the correct mathematical properties. ☐ Identify and sketch planes of symmetry of 3D shapes. ☐ Draw angles and 2D shapes accurately using a ruler, protractor and compass. ☐ Recognise nets and make accurate drawings of nets of common 3D objects. ☐ Find and use three-figure bearings. ☐ Use angles at parallel lines to work out bearings.	☐ Draw plans and elevations of 3D solids. ☐ Calculate volume of prisms and cylinders ☐ Calculate surface area of prisms and cylinders. ☐ Reflect, rotate, translate and enlarge 2D shapes. ☐ Enlarge shapes by a fractional scale factor about a centre of enlargement. ☐ Draw and use scales on maps and scale drawings. ☐ Use bearings. ☐ Construct triangles, perpendicular bisector of a line and an angle bisector. ☐ Draw a locus and use loci to solve problems.	☐ Enlarge shapes by a negative scale factor about a centre of enlargement. ☐ Find the result of the series of transformations. ☐ Link constructions and geometrical reasoning. ☐ Explore volumes of cones, pyramids and spheres.
Interpreting and representing data	☐ Draw and interpret comparative and composite bar charts. ☐ Draw and interpret pie charts.	☐ Construct and use two-way tables. ☐ Plot and interpret time series graphs. ☐ Construct and interpret stem and leaf diagrams. ☐ Plot and interpret scatter graphs determining whether or not there is a relationship between sets of data. ☐ Decide which average is best for a set of data. ☐ Estimate the mean and range from a grouped frequency table and find the modal class and the group containing the median.	☐ Use trends of time-series graphs to predict what might happen in the future. ☐ Recognise misleading graphs.
Graphs	☐ Recognising equations of vertical and horizontal graphs.	☐ Linear graphs – plot, compare, find the gradient and y-intercept and use the equations of a straight line. ☐ Draw and interpret distance-time graphs. ☐ Understand velocity-time graphs. ☐ Draw and interpret quadratic graphs. ☐ Use graphs to solve quadratic equations.	☐ Find the coordinates, gradient and length of a line segment through two points. ☐ Find the acceleration and distance from velocity-time graphs. ☐ Find the equations of lines parallel or perpendicular to a given line. ☐ Draw and use cubic graphs to solve cubic equations. ☐ Draw the graph of a circle. ☐ Draw graphs of reciprocal functions. ☐ Graphs of simultaneous equations.
Rates	☐ Reading simple distance-time graphs.	☐ Solve speed, distance and time problems ☐ Use distance – time graphs ☐ Solve problems with density, mass and volume. ☐ Rates of change ☐ Convert compound units	☐ Interpreting velocity – time graphs.

Probability	Calculate single event probability	☐ Relative frequency ☐ Expected outcomes ☐ Independent events ☐ Use diagrams to work out probabilities	☐ Use tree diagrams ☐ Use tree diagrams without replacement problems
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