

## Airedale Academy's KS3 Assessment Overview

At Airedale Academy, assessment is embedded into lessons in a coherent manner. Key Assessment Pieces will follow a sequence of 6-8 lessons, using a mastery-approach to teaching and learning, by which Key Assessment Pieces are used to assess the extent to which students know more and can remember more of the curriculum that has been taught specific to their age and stage of education.

Written Key Assessment Pieces will be completed in 'Silent and Independent' conditions and should assess the extent to which curriculum knowledge and skills have been grasped by students and can be reapplied. However, in some subjects such as Dance, Drama, PE and Music, Key Assessment Pieces may be collaborative and of a more practical nature and may include photographic or video evidence, a record of verbal feedback, a written evaluation and/or a written reflection. The information gleaned by the teacher through diagnostic marking and feedback will be used to close specific gaps in learning and to address misconceptions, leading to improved progress over time.

The information gained from the marking and feedback of Key Assessment Pieces, will be used to assess students' progress (relative to starting point) more holistically in terms of their grasp of the curriculum at key points of the academic year, using the identified 'Expected' and 'Enhanced' knowledge and skills listed below.

Progress will be holistically reported to students and their parents/carers, relative to starting point for that particular point of their KS3 journey, as follows: 'On Track'- making expected progress; 'Working Towards'- making less than expected progress and 'Exceeding'- making enhanced progress appropriate to their age and stage of education.

| <b>Subject: Mathematics</b>   |                  |                 |
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| <b>Objective:</b>   | <b>Essential</b> | <b>Enhanced</b> |
| <b><u>Year 7</u></b>  |                  |                 |
| To identify appropriate standard units of measurement                                 |                  |                 |
| To use 12- and 24-hour clocks for time and solve simple problems involving time       |                  |                 |
| To recognise place value in positive and negative integers and order and compare them |                  |                 |
| To recognise place value in positive and negative decimals and order and compare them |                  |                 |
| To convert between mixed numbers and improper fractions                               |                  |                 |
| To write one quantity as a fraction of another in the simplest form                   |                  |                 |
| To use place value to convert decimals into fractions and write them in simplest form |                  |                 |
| To convert percentages into decimals and fractions written in simplest form           |                  |                 |
| To recall simple fraction/decimal/percentage equivalences                             |                  |                 |

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| To order and compare fractions, decimals and percentages by writing as fractions with a common denominator            |  |  |
| To round numbers to a given number of decimal places  |  |  |
| To round numbers to a given number of significant figures   |  |  |
| To use standard letter conventions for labelling line segments, angles and shapes                                     |  |  |
| To classify angles by type and recognise lines which are parallel & perpendicular                                     |  |  |
| To identify 2D shapes   |  |  |
| To use formal column addition and subtraction with positive integers and decimals                                     |  |  |
| To recognise addition and subtraction as inverse operations and use this to check results                             |  |  |
| To use estimation to check whether a result is sensible   |  |  |
| To add and subtract fractions and mixed numbers   |  |  |
| To use x- and y- coordinates to specify points  |  |  |
| To construct a perfect set of axes  |  |  |
| To use formal written methods to multiply positive integers together and to multiply a decimal by a positive integer  |  |  |
| To use formal written methods to multiply positive integers together and to multiply a decimal by a positive integer  |  |  |
| To multiply positive decimals together  |  |  |
| To use formal written methods to divide positive integers and to divide a decimal by a positive integer               |  |  |
| To divide a positive decimal by another positive decimal  |  |  |
| To recognise multiplication and division as inverse operations and use this to check results                          |  |  |
| To use estimation to check whether a result is sensible   |  |  |
| To use division to convert fractions into decimals  |  |  |
| To convert between decimals and percentages by multiplying/dividing by 100  |  |  |
| To order and compare fractions, decimals and percentages by writing as decimals or percentages                        |  |  |
| To multiply a fraction or mixed number by an integer and find a fraction of a quantity                                |  |  |
| To multiply fractions and mixed numbers   |  |  |
| To divide fractions and mixed numbers by integers and by other fractions and mixed numbers                            |  |  |
| To square and cube numbers and recognise roots as inverse operations  |  |  |
| To recall positive integer squares and corresponding roots up to $15^2$ and cubes and corresponding roots up to $6^3$ |  |  |
| To use positive integer indices and recall simple powers of 2 and 10  |  |  |
| To apply BIDMAS when performing calculations  |  |  |
| To add and subtract with negative numbers (including decimals, fractions and mixed numbers)                           |  |  |
| To multiply with negative numbers (including decimals, fractions and mixed numbers)                                   |  |  |

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| To divide with negative numbers (including decimals, fractions and mixed numbers)  |  |  |
| To apply BIDMAS when performing more complex calculations involving negative numbers (including decimals, fractions and mixed numbers) |  |  |
| To use letters to represent unknowns and simplify algebraic expressions  |  |  |
| To substitute numbers into expressions   |  |  |
| To multiply a term over a single bracket   |  |  |
| To solve linear equations with unknowns on one side  |  |  |
| To solve linear equations with unknowns on both sides  |  |  |
| To set up and solve linear equations   |  |  |
| To understand the term factor and identify the common factors of 2 numbers and by listing these, the HCF                               |  |  |
| To write a number as a product of its prime factors  |  |  |
| To represent prime factorisations of 2 numbers in a Venn diagram and use this to find the HCF  |  |  |
| To calculate the perimeter of rectilinear shapes   |  |  |
| To recall and use the formulae for circumference of a circle   |  |  |
| To calculate the perimeter of a sector of a circle   |  |  |
| To calculate the perimeter of composite 2D shapes which include sectors  |  |  |
| To understand the term multiple and identify common multiples of 2 numbers and by listing these, the LCM                               |  |  |
| To represent prime factorisations of 2 numbers in a Venn diagram and use this to find the LCM  |  |  |
| To recall and use the formula for area of rectangles and parallelograms  |  |  |
| To recall and use the formula for area of triangles  |  |  |
| To recall and use the formula for area of a trapezium  |  |  |
| To calculate the area of composite rectilinear 2D shapes by splitting into appropriate parts   |  |  |
| To recall and use the formulae for area of a circle  |  |  |
| To calculate the area of a sector of a circle  |  |  |
| To calculate the area of composite 2D shapes which include sectors   |  |  |
| To identify bias in sampling & conduct simple random sampling  |  |  |
| To identify the mode for ungrouped data presented in lists and tables and the modal class for grouped data                             |  |  |
| To identify the median for ungrouped data presented in lists and tables and the class which contains the median for grouped data       |  |  |
| To calculate the mean for ungrouped data presented in lists and tables   |  |  |
| To calculate an estimate of the mean for grouped data  |  |  |

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| To describe data sets using summary values and make comparisons   |  |  |
| To plot graphs of linear functions using tables of values   |  |  |
| To use graphs to find approximate solutions to linear equations   |  |  |
| To calculate the gradient of a straight line  |  |  |
| To understand the form $y = mx + c$   |  |  |
| To use $y = mx + c$ to identify and sketch simple linear functions  |  |  |
| To find equations of parallel lines including those which go through particular points  |  |  |
| To calculate the range for ungrouped data presented in lists and tables and calculate an estimate of the range for grouped data                           |  |  |
| To use the range to make comparisons on the consistency of data sets  |  |  |
| To describe data sets using statistics and make comparisons   |  |  |
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| <b>Year 8</b>   |  |  |
| To write 1 quantity as a percentage of another by writing as a fraction with a denominator of 100   |  |  |
| To write 1 quantity as a percentage of another by using division  |  |  |
| To calculate a percentage of a quantity using a non-calculator build-up method  |  |  |
| To calculate a percentage of a quantity using decimal multipliers   |  |  |
| To increase/decrease a quantity by a given percentage   |  |  |
| To find the original value given the outcome of a percentage increase/decrease  |  |  |
| To calculate the percentage increase/decrease given original and new values   |  |  |
| To solve problems involving simple interest   |  |  |
| To calculate missing angles in increasingly complicated diagrams using vertically opposite angles and the sum of angles on a straight line and at a point |  |  |
| To identify alternate, corresponding and co-interior angles in parallel lines   |  |  |
| To calculate missing angles in increasingly complicated diagrams using the angle properties of parallel and intersecting lines                            |  |  |
| To interpret, where appropriate, simple expressions as functions with inputs and outputs  |  |  |
| To identify a term-to-term rule for an arithmetic sequence and use this to continue the sequence (sequences may be numerical or diagrams)                 |  |  |
| To generate an arithmetic sequence or particular terms in a sequence from a position-to-term ( $n^{\text{th}}$ term) rule                                 |  |  |
| To find a formula for the $n^{\text{th}}$ term of an arithmetic sequence (sequences may be numerical or diagrams)   |  |  |

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| To identify reflection and rotation symmetry in 2D shapes and diagrams  |  |  |
| To complete partly drawn diagrams to give specific reflection and rotation symmetry   |  |  |
| To derive and use the sum of interior angles of a triangle is $180^\circ$   |  |  |
| To know and use the basic properties of scalene, right-angled, isosceles and equilateral triangles and use these to solve problems      |  |  |
| To derive and use the sum of interior angles of a quadrilateral is $360^\circ$  |  |  |
| To know and use the basic properties of squares, rectangles, parallelograms, trapezia, kites and rhombi and use these to solve problems |  |  |
| To derive and use the sum of exterior angles of any polygon is $360^\circ$  |  |  |
| To find and use the sum of interior angles of regular and irregular polygons  |  |  |
| To construct and interpret frequency tables   |  |  |
| To construct and interpret single, multiple and composite bar charts and vertical line charts   |  |  |
| To construct and interpret pictograms   |  |  |
| To construct and interpret frequency polygons   |  |  |
| To construct pie charts where the total frequency is a multiple or factor of 360  |  |  |
| To interpret pie charts   |  |  |
| To construct and interpret line graphs for time series data including identification of trends  |  |  |
| To recognise graphical misrepresentation  |  |  |
| To identify terms, expressions, equations and formulae  |  |  |
| To write expressions and formulae from real-world contexts  |  |  |
| To substitute numbers into increasingly complicated expressions and formulae (recalling BIDMAS)   |  |  |
| To rearrange formulae to change the subject, where that subject appears once only   |  |  |
| To factorise algebraic expressions by taking out a common factor  |  |  |
| To rearrange formulae to change the subject, where that subject appears twice   |  |  |
| To identify and describe cubes, cuboids, prisms, cylinders, pyramids, cones and spheres   |  |  |
| To construct and identify possible nets for 3D shapes   |  |  |
| To interpret plans and elevations of 3D shapes  |  |  |
| To construct plans and elevations of 3D shapes  |  |  |
| To draw 2D representations of 3D shapes on isometric paper including from plans and elevations  |  |  |
| To solve problems involving volume of cubes and cuboids   |  |  |
| To use the formula for volume of prisms including to find missing sides when given the volume   |  |  |

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| To use the formula for volume of cylinders including to find missing sides when given the volume          |  |  |
| To use the formula for volume of pyramids and cones including to find missing sides when given the volume |  |  |
| To use the formula for volume of a sphere including to find the radius when given the volume              |  |  |
| To calculate the volume of composite 3D shapes  |  |  |
| To understand ratio notation and interpret a ratio of 2 parts as a fraction of a whole                    |  |  |
| To write ratios in their simplest form  |  |  |
| To write ratios in the form 1 : n and n : 1   |  |  |
| To divide a quantity into 2 or 3 parts given the ratio of the parts                                       |  |  |
| To calculate one quantity from another given the ratio of the 2 quantities                                |  |  |
| To solve problems involving ratio   |  |  |
| To calculate the surface area of cubes, cuboids, other prisms and pyramids                                |  |  |
| To calculate the surface area of cylinders  |  |  |
| To calculate the surface area of cones  |  |  |
| To calculate the surface area of spheres and hemispheres  |  |  |
| To calculate the surface area of composite shapes   |  |  |
| To use appropriate words to describe the likelihood of events   |  |  |
| To use the 0-1 probability scale  |  |  |
| To calculate theoretical probabilities for events with equally likely outcomes                            |  |  |
| To use systematic listing strategies to calculate the probability of a combination of events              |  |  |
| To use sample spaces to calculate the probability of more complex combinations of events                  |  |  |
| To use Venn diagrams to represent sets and use these to calculate simple probabilities                    |  |  |
| To know and use the fact that $p(A) + p(\text{not } A) = 1$   |  |  |
| To reflect a shape in a given mirror line   |  |  |
| To identify the mirror line for a given reflection  |  |  |
| To rotate a shape about a given centre of rotation  |  |  |
| To specify the angle, direction and centre for a given rotation   |  |  |
| To use column vectors to translate shapes and describe translations                                       |  |  |
| To enlarge shapes from a given centre using a positive integer scale factor                               |  |  |
| To enlarge shapes from a given centre using a positive fractional scale factor                            |  |  |
| To identify the scale factor and centre for a given enlargement   |  |  |
| To use relative frequency as an estimate of probability   |  |  |

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| To record and analyse the relative frequency of outcomes of repeated experiments   |  |  |
| To understand that relative frequencies approach theoretical probabilities as the number of trials is increased  |  |  |
| To use relative frequency to calculate expectation in future experiments   |  |  |
| To use a ruler, protractor and compasses to accurately draw diagrams   |  |  |
| To interpret scale drawings  |  |  |
| To construct scale drawings  |  |  |
| To use 3-figure bearings   |  |  |
| To solve problems using scale drawings and bearings  |  |  |
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| <b>Year 9</b>  |  |  |
| To use negative integer indices  |  |  |
| To use fractional indices  |  |  |
| To calculate with powers and roots   |  |  |
| To estimate the value of the square or cube root of a number   |  |  |
| To know and apply the laws of indices  |  |  |
| To simplify algebraic expressions using index laws   |  |  |
| To convert numbers to and from standard form   |  |  |
| To order numbers when some are given in standard form  |  |  |
| To calculate with numbers in standard form with and without a calculator   |  |  |
| To expand the product of 2 binomial expressions  |  |  |
| To factorise quadratic expressions with unitary coefficient of $x^2$   |  |  |
| To solve quadratic equations with unitary coefficient of $x^2$ by factorising  |  |  |
| To rearrange and solve quadratic equations by factorising  |  |  |
| To complete the square on a quadratic expression and use this to solve quadratic equations   |  |  |
| To solve quadratic equations using the quadratic formula   |  |  |
| To use a table of values to plot the graph of a quadratic function   |  |  |
| To use a graph to find the approximate roots of a quadratic equation   |  |  |
| To sketch graphs of simple quadratic functions, identifying the intercepts and using both symmetry and completing the square to identify the turning point |  |  |
| To know and convert between different metric units of measure for length, mass and capacity  |  |  |

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| To know and use approximate equivalences between metric and imperial units of measure for length, mass and capacity                                      |  |  |
| To use Pythagoras' theorem to find the length of the hypotenuse of a right-angled triangle   |  |  |
| To use Pythagoras' theorem to find the length of a shorter side of a right-angled triangle   |  |  |
| To apply Pythagoras' theorem to 3D problems including those involving surface area and volume of pyramids  |  |  |
| To identify when quantities are in direct proportion and use this to solve simple problems   |  |  |
| To form and use equations for quantities in direct proportion including when a quantity is in direct proportion to a power or root of another quantity   |  |  |
| To identify when quantities are in inverse proportion and use this to solve simple problems  |  |  |
| To form and use equations for quantities in inverse proportion including when a quantity is in inverse proportion to a power or root of another quantity |  |  |
| To recognise and interpret graphs that show direct and inverse proportion  |  |  |
| To understand the term congruence and identify congruent shapes  |  |  |
| To prove that two triangles are congruent using SSS, ASA, SAS or RHS   |  |  |
| To represent inequalities on a number line   |  |  |
| To solve linear inequalities in one variable, representing the solutions on a number line  |  |  |
| To solve quadratic inequalities in one variable, representing the solutions on a number line   |  |  |
| To solve linear equalities in 2 variables, representing the solution set on a graph  |  |  |
| To identify the solution sets of several linear inequalities on a graph  |  |  |
| To understand mathematical similarity and identify similar triangles   |  |  |
| To prove that 2 triangles are similar  |  |  |
| To use similarity to calculate unknown lengths in similar figures  |  |  |
| To recognise the impact of enlargement on area and volume and use this to calculate missing lengths, areas and volumes in similar shapes                 |  |  |
| To round numbers to an appropriate degree of accuracy using significant figures  |  |  |
| To estimate the solution to a complex calculation by rounding appropriately  |  |  |
| To identify the error interval for a number which has been rounded or truncated to a given degree of accuracy  |  |  |
| To calculate the upper and lower bounds of calculations and problems which use numbers rounded to a known degree of accuracy                             |  |  |
| To know and use the relationship between speed, distance and time  |  |  |
| To know and use the relationship between density, mass and volume  |  |  |

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| To know and use the relationship between pressure, force and area   |  |  |
| To construct and interpret 2-way tables and use them to calculate probabilities   |  |  |
| To construct and interpret frequency trees and use them to calculate probabilities  |  |  |
| To use set notation to describe a set of numbers or objects   |  |  |
| To use Venn diagrams to represent sets and use these to calculate probabilities   |  |  |
| To use tree diagrams to record the probabilities of successive independent and dependent events   |  |  |
| To use tree diagrams to calculate the probabilities of combined events  |  |  |
| To use the product rule for counting numbers of outcomes of combined events   |  |  |
| To recognise whether a sample space, Venn diagram or tree diagram will be most appropriate to use for solving a complex probability problem |  |  |
| To understand and use conditional probability   |  |  |
| To construct and interpret real-life graphs   |  |  |
| To interpret straight line gradients as rates of change   |  |  |
| To use gradient of chords and tangents to estimate average and instantaneous rates of change  |  |  |
| To interpret calculated or estimated gradients in context   |  |  |
| To calculate or estimate areas under graphs and interpret these in context  |  |  |