# Year 8 Maths: Assessment and Progression Grid

| | Number & Algebra | Geometry | Statistics | Fluency and Problem Solving |
|---|---|---|---|---|
| Excelling | • Students choose to use fractions or percentages to solve problems involving repeated proportional changes or the calculation of the original quantity given the result of a proportional change.<br>• They evaluate algebraic formulae or calculate one variable, given the others, substituting fractions, decimals, and negative numbers.<br>• They manipulate algebraic formulae, equations, and expressions, finding common factors and multiplying two linear expressions.<br>• They sketch and interpret linear graphs and solve problems using intersections and gradients of graphs.<br>• In simplifying algebraic expressions, they use rules of indices in both positive and negative values. | • Students calculate circumferences, lengths of circular arcs and areas of sectors, and calculate the area of trapezia and compound shapes.<br>• They know and use the properties of quadrilaterals.<br>• They solve problems using angle and symmetry, properties of polygons and angle properties of intersecting and parallel lines and explain these properties.<br>• They can accurately construct shapes and lines using pairs of compasses.<br>• They can accurately construct triangles given SSS, SAS or ASA.<br>• Students always use the correct labelling notation for lines and angles. | • Students interpret and construct cumulative frequency tables.<br>• They can calculate the mean of grouped data, find the modal class, and calculate the range. They then use these to compare distributions and make inferences about the data.<br>• They understand how to interpret scatter graphs and how different sample sizes may affect the reliability of conclusions drawn. | • Students are fluent in their times tables up to 15 without using a written process.<br>• 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.<br>• 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 8 curriculum.<br>• They can extract all relevant numerical values from text-based information.<br>• They can independently devise an approach and strategy with which to calculate solutions to problems presented to them.<br>• They demonstrate confidence in being able to prove why an answer is correct.<br>• They set calculations out clearly to show the process derived in their working out.<br>• They always communicate mathematical meaning to different audiences through precise and consistent use of symbols |

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| Secure | • Students solve numerical problems involving multiplication and division with numbers of any size, using a calculator efficiently and appropriately.<br>• They evaluate one number as a fraction or percentage of another.<br>• They understand and use the equivalences between fractions, decimals, and percentages, and calculate using ratios in appropriate contexts.<br>• They find and describe, in words, the rule for the next term or nth term of a sequence where the rule is linear.<br>• They formulate and solve linear equations with whole-number coefficients.<br>• They understand and use proportional changes, calculating the result of any proportional change using only multiplicative methods.<br>• They find and describe, in symbols, the next term or nth term of a sequence where the rule is linear or quadratic. | • Students know and use the properties of quadrilaterals.<br>• They solve problems using angle and symmetry, properties of polygons and angle properties of intersecting and parallel lines and explain these properties. • They understand and use appropriate formulae for finding circumferences and areas of circles, areas of plane rectilinear figures and areas of trapezia when solving problems.<br>• They appreciate the imprecision of measurement and recognise that a measurement given to the nearest whole number may be inaccurate by up to one half in either direction.<br>• They can construct shapes and lines using pairs of compasses with and accuracy of within 1mm or 1 degree.<br>• They can construct triangles within 1mm or 1 degree of the given angle, given SSS, SAS or ASA.<br>• They understand and use labelling notation for lines and angles. | • Students collect and record continuous data, choosing appropriate equal class intervals over a sensible range to create frequency tables. They determine the modal class and estimate the mean, median and range of sets of grouped data, selecting the statistic most appropriate to their line of enquiry.<br>• They construct and interpret frequency diagrams.<br>• They construct pie charts. • They draw conclusions from scatter diagrams and have a basic understanding of correlation. | • Students are fluent in their times tables up to 12 without using a written process.<br>• They 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.<br>• They apply the order of operations rules for all calculations.<br>• They are proficient in the use of a scientific calculator when completing calculations in line with the Year 8 curriculum.<br>• They can extract relevant numerical values from text-based information<br>• They can carry out substantial tasks and solve quite complex problems by independently and systematically breaking them down into smaller, more manageable tasks.<br>• Their written and spoken language explains and informs their use of diagrams.<br>• They begin to give mathematical justifications, making connections between the current situation and situations they have encountered before. |

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|---|---|---|---|---|
| Developing | • Students recognise approximate proportions of a whole and use simple fractions and percentages to describe these.<br>• They begin to use simple formulae expressed in words.<br>• They solve simple problems involving ratio and direct proportion.<br>• They calculate fractional or percentage parts of quantities and measurements, using a calculator where appropriate.<br>• They construct, express in symbolic form, and use simple formulae involving one or two operations.<br>• They use brackets appropriately.<br>• They use and interpret coordinates in all four quadrants and use this to plot linear graphs. | • Students choose and use appropriate units and tools, interpreting, with appropriate accuracy, numbers on a range of measuring instruments.<br>• When constructing models and drawings, or using shapes, students measure angles to the nearest degree and draw angles between two intersecting lines to with 1 degree of accuracy.<br>• They use correct language associated with angles.<br>• They know the angle sum of a triangle and that of angles at a point.<br>• They convert one metric unit to another.<br>• They make sensible estimates of a range of measures in relation to everyday situations.<br>• They understand and use the formula for the area of a rectangle and triangle.<br>• They can construct shapes and lines with pairs of compasses and triangles given the lengths of sides and/or the angles, albeit with a low-level accuracy. | • Students collect discrete data and record them using a frequency table.<br>• They understand and use the mean of discrete data, mode, and range to describe sets of data.<br>• They group data in equal class intervals, where appropriate, representing collected data in frequency diagrams and interpreting such diagrams.<br>• They construct & interpret simple line graphs.<br>• They construct and interpret graphs and diagrams, including pie charts, and draw conclusions.<br>• They compare two simple distributions using the range and one of the modes, median or mean | • 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.<br>• They use a written process for division calculations and multiplications above 12.<br>• They adhere to the order of operations rules for the vast quantity of calculations.<br>• They are able to use a scientific calculator when completing calculations in line with the Year 8 curriculum.<br>• They are able to 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.<br>• When solving problems, with or without a calculator, they check their results are reasonable by considering the context or the size of the numbers.<br>• They look for patterns and relationships, presenting information and results in a clear and organised way. |

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| Emerging | • Students can express ratios in simplest form and understand that a ratio is the division of equal parts of a whole and can express ratios as fractions of the whole.<br>• They recognise sequences of numbers, including odd and even numbers.<br>• They construct, express in symbolic form, and use simple formulae involving one operation.<br>• They use and interpret coordinates in the positive quadrant and use this to plot linear graphs. | • Students use mathematical names for common 2-D shapes and describe their properties, including numbers of sides and corners.<br>• They distinguish between straight and turning movements, understand angle as a measurement of turn, and recognise right angles in turns. • They begin to use every day, non-standard and standard units to measure length in a range of contexts.<br>• They can construct circles using a pair of compasses, albeit with a low level of accuracy. | • Students classify objects using more than one criterion.<br>• When they have gathered information, students record results in simple lists and tables to communicate findings.<br>• Students extract and interpret information from simple tables and lists.<br>• They construct bar charts and pictograms, where the symbol represents a group of units, to communicate information, & interpret information presented in these forms. | • 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.<br>• They use a written process for division calculations.<br>• They understand the rules of order of operations but do not always adhere to them.<br>• Student mental arithmetic is limited to basic one step calculations involving addition or subtraction.<br>• They can use a scientific calculator with guidance when completing calculations in line with the Year 8 curriculum.<br>• They require considerable support in extracting information from questions and in formulating a strategy with which to conduct calculations.<br>• 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. |