**Year 8 Assessment without Levels – Maths Progress Descriptor**

**Assessment 1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Acquiring | Developing | Securing | Extending |
| Rounding | Place value  Rounding to 1 decimal place  Rounding to 2 decimal places | Recap on rounding to decimal places emphasise when e.g. rounding 36.79992 to 2 dp that the answer is 36.80  Approximation  Ensure you use some contextualised questions to recap on other topics | Recap on rounding to decimal places emphasise when e.g. rounding 36.79992 to 2 dp that the answer is 36.80  Approximation  Ensure you use some contextualised questions to recap on other topics | Recap on rounding to decimal places emphasise when e.g. rounding 36.79992 to 2 dp that the answer is 36.80  Rounding to a certain number of sig figs. Students can get confused with eg round 34,567 to 2 sf which is 35,000 but when you round 0.00034567 to 2sf the answer is 0.00035 (ie the zeros aren’t needed on the end in this case)  Ensure you use some contextualised questions to recap on other topics |
| Area (and Volume for some) | Area of rectangles and squares  Area of triangles  Area of parallelograms  Problem solving, working backwards and functional problems. | Revision of areas of rectangles, squares, triangles and parallelograms  Area of compound shapes focusing on questions which work backwards and are multi-stage. Including two shapes e.g. the area of the parallelogram is twice the area of the triangle what is the height of the triangle? Functional questions from GCSE how many packs of floorboards  Circumferences of Circles  Area of circles  Problem solving including finding fractions of circles and perimeters of shapes including working backwards | Revision of areas of rectangles, squares, triangles, parallelograms and compound shapes focusing on questions which work backwards and are multi-stage. Including two shapes e.g. the area of the parallelogram is twice the area of the triangle what is the height of the triangle? Functional questions from GCSE how many packs of floorboards  Circumferences of Circles and perimeters of sectors and compound shapes including circles and working backwards Areas of circles, sectors and compound shapes including circles and sectors  Surface area of cuboids, triangular prisms and cylinders Changing metric area measurements 4cm2 to mm2 and 7m2 to cm2 | Revision of areas of rectangles, squares, triangles, parallelograms and compound shapes focusing on questions which work backwards and are multi-stage. Including two shapes e.g. the area of the parallelogram is twice the area of the triangle what is the height of the triangle? Functional questions from GCSE how many packs of floorboards  Circumferences of Circles and perimeters of sectors and compound shapes including circles and working backwards  Areas of circles, sectors and compound shapes including circles and sectors  Volumes of cuboids, triangular prisms and cylinders and working backwards to find lengths given volume  Surface area of cuboids, triangular prisms and cylinders  Changing metric area and volume measurements 5cm3 to mm3 and 6m3 to cm3 4cm2 to mm2 and 7m2 to cm2 |

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| Rearranging Formulae |  |  |  | Link work to previous work done on area – presumably most working backwards work will have been done by substituting and then solving an equation so focus on how these could have been done without substituting in numbers. Start with lots of area, volume equations so students can see the link  Move onto unfamiliar formulae and make links to the same method as solving equations – doing to one side of the equation what you do to the other |
| Fractions | Simplifying fractions  Changing top heavy to mixed numbers  Teach how to add and subtract proper fractions.  Fractions of amounts | Recap simplifying fractions and changing top heavy fractions into mixed numbers.  Teach how to add and subtract proper fractions.  If confident look at mixed numbers with adding and subtracting.  Multiplying proper fractions.  Dividing proper fractions. | Quick recap on changing between mixed numbers and making equivalent fractions. Include questions such as is or closer to 1  Teach adding and subtraction fractions together moving though proper fractions and then to mixed numbers. Include problem solving.  Teach multiplying proper fractions and then to mixed numbers. Include problem solving.  Teach dividing proper fractions and then to mixed numbers. Include problem solving. | Quick recap on changing between mixed numbers and making equivalent fractions. Include questions such as is or closer to 1  Teach adding and subtraction fractions together moving though proper fractions and then to mixed numbers. Include problem solving.  Teach multiplying proper fractions and then to mixed numbers. Include problem solving.  Teach multiplying proper fractions and then to mixed numbers. Include problem solving. |

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**Assessment 2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Acquiring | Developing | Securing | Extending |
| Fractions, Decimals and Percentages | Revisit relationships between F/D/P and be able to confidently change between the 3 with and without a calculator  Simple percentages of amounts  Percentage increase and decrease  Problem solving with percentages | Revisit relationships between F/D/P and be able to confidently change between the 3 with and without a calculator (may need 2 lessons)  Find fractions of amounts with and without a calculator  Find percentages of amounts with and without a calculator  Percentage change – including loss and profit  Problem solving questions involving FDP | Revisit relationships between F/D/P and be able to confidently change between the 3 with and without a calculator  Find fractions of amounts with and without a calculator  Find percentages of amounts with and without a calculator  Percentage change – including loss and profit  Problem solving questions involving FDP | Revisit relationships between F/D/P and be able to confidently change between the 3 with and without a calculator  Find fractions and % of amounts with and without a calculator Percentage change – including loss and profit  Simple interest  Compound interest and understanding the difference between simple and compound interest  Original Quantity/Reverse percentages -may be useful to use bar modelling for this. |
| Representing Data | Testing a hypothesis  Collecting and grouping data and types of data  Interpret bar charts  Constructing and Interpreting  Stem and Leaf diagrams  Constructing Pie charts  Interpreting Scatter Diagrams | Testing a hypothesis  Collecting and grouping data and types of data  Interpret bar charts  Constructing and Interpreting Stem and Leaf diagrams  Pie charts  Scatter Diagrams | Testing hypothesis  Collecting and grouping data and types of data  interpret bar charts  Constructing and Interpreting Stem and Leaf diagrams  Pie charts  Scatter Diagrams | Testing hypothesis  Collecting and grouping data and types of data  Constructing and Interpreting back to back Stem and Leaf diagrams  Pie charts focus on interpeting  Scatter Diagrams  Constructing and Interpreting Box plots |
| Volume | Volume of cuboids/cubes/triangular prisms including working backwards and problem solving  Volume of cylinders  Volume of prisms e.g. L/T shapes including working backwards and problem solving  Functional GCSE volume problems  If time Plans and elevations | Volume of cuboids/cubes/triangular prisms including working backwards and problem solving  Volume of cylinders if possible working backwards and problem solving  Volume of prisms e.g. L/T shapes including working backwards and problem solving  Functional GCSE volume problems  If time Plans and elevations | Volume of cuboids/cubes/triangular prisms including working backwards and problem solving  Volume of prisms e.g. L/T shapes including working backwards and problem solving  Functional GCSE volume problems  Nets  Plans and elevations  Changing metric volume units |  |

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| Indices (& BIDMAS) |  | Brief recap on square and cube numbers and roots.  Knowing and using that =  Knowing and using the rules of indices ,    and =  BIDMAS | Brief recap on square and cube numbers and roots.  Knowing and using that =  Knowing and using the rules of indices ,    and =  BIDMAS | Brief recap on square and cube numbers and roots. Know and use the fact if x2 = 9 then x = 3  Knowing and using that = =  = and the reciprocal of a number  Knowing and using the rules of indices , and = |
| Standard form |  |  |  | Learn what standard form is and why it is used – usually best to start with v large numbers.  Change between standard form and ordinary numbers  Order numbers given in standard form  Add and multiply in standard form without a calculator  Multiply and divide in standard form without a calculator – build on rules of indices  Learn how to use a calculator to input numbers in standard form  Learn how to calculate in standard form with a calculator – paying particular attention to how the answer needs to be given |

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**Assessment 3**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Acquiring | Developing | Securing | Extending |
| Factors, Multiples, Squares and Cubes  BIDMAS | Investigate number patterns ie odds, evens, multiples and factors  Find square and cubes of numbers including calculator work  Work backwards to find square and cube roots  BIDMAS – basic calculations | Recap on square and cube numbers and roots – involve calculator work  Revision of factors and multiples  LCM and HCF  BIDMAS |  |  |
| Averages | Recap of averages  Finding missing values from a set of data given eg average  Calculations from frequency tables  Comparing data | Recap of averages  Finding missing values from a set of data given eg average  Calculations with means – given the mean for 10 students and then an extra students data is added what is the new mean  Calculations from frequency tables | Recap of averages  Finding missing values from a set of data given eg average  Calculations with means – given the mean for 10 students and then a extra students data is added what is the new mean  Calculations from frequency tables | Recap of averages  Finding missing values from a set of data given eg average  Calculations with means – given the mean for 10 students and then a extra students data is added what is the new mean Calculations from frequency tables  Calculations from grouped frequency tables |
| (Bearings and Loci ) and Constructions | Measuring angles  Constructing triangles | Bearings – define bearings, draw, measure, find from non-accurate diagrams  Find bearings from A to B and B to A  Constructing triangles  Constructions – see all in left column  Scale drawings – including angles of elevation and depression  functional questions on scale drawings | Bearings – define bearings, draw, measure, find from non-accurate diagrams  Find bearings from A to B and B to A  Constructions – see all in left column  Scale drawings – including angles of elevation and depression  Functional questions on scale drawings | Bearings – define bearings, draw, measure, find from non accurate diagrams  Find bearings from A to B and B to A  Constructions – see all in left column  Loci – see all in left column  Problem solving with loci  Scale drawings – could include angles of elevation and depression |

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| Pythagoras |  |  | Introduce Pythagoras’ theorem  Demonstration/Proof of Pythagoras – just to give students an understanding of what proof is  Applications of Pythagoras  Converse of theorem – checking whether a triangle is right angled from the measurements given  Using Pythagoras’ theorem with isosceles triangles | Revision of basic application of theorem including Pythagorean triples  Applications of Pythagoras – including using isosceles triangles  Converse of Theorem – checking whether a triangle is right angled from the measurements given  Proof of Pythagoras – just to give students an understanding of what proof is  Repeated applications of Pythagoras – two triangles together  Pythagoras in 3D |
| Money Calculations and Best Buy | Recap work with decimals  Addition and subtraction questions using money/getting change etc  Multiplying an integer by a decimal to find cost of multiple items  Divide values to find out of prices of single items  Calculator work on money calculations  Best buy problems |  |  |  |
| Directed Number |  | Adding and Subtracting negative numbers Multiplying and dividing negative numbers  Using negative numbers in contextual questions with BIDMAS  Substitution |  |  |

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**Assessment 4**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Acquiring | Developing | Securing | Extending |
| Directed Number | Adding and Subtracting negative numbers  Multiplying and dividing negative numbers  Using negative numbers in contextual questions with BIDMAS  Substitution |  |  |  |
| Algebra | Revision of simplifying expressions  Expanding brackets -see all types in left column. Then expand and simplify  Solving equations with brackets up to 3 steps, include fraction solutions  Generate sequences from nth terms  Finding nth terms | Revision of simplifying expressions  Expanding brackets -see all types in left column. Then expand and simplify  Solving equations with brackets up to 3 steps, include fraction solutions  Creating and solving equations.  Inequalities  Solving inequalities  Finding nth terms | Revision of simplifying expressions  Expanding brackets -see all types in left column. Then expand and simplify  Solving equations with brackets up to 3 steps, include fraction solutions  Creating and solving equations.  Inequalities  Solving inequalities  Finding nth terms  Using nth terms to solve problems | Revision of simplifying expressions  Expanding brackets -see all types in left column. Then expand and simplify  Solving equations with brackets up to 3 steps, include negative and non-integer solutions  Creating and solving equations.  Solving equations with non-integer coefficients of x.  Recap of Inequalities, then solving inequalities  Finding and using nth terms  Using simple iterative formulae |
| Probability |  | Recap finding probabilities using equally likely outcomes from Year 7  Finding the expected number of successes from an experiment  Find the missing probability from a table  Relative frequency so that students know the best estimate comes from the experiment with the most trials. Do an experiment.  Create and complete sample space diagrams and use them to calculate probabilities. | Recap finding probabilities using equally likely outcomes from Year 7  Finding the expected number of successes from an experiment  Find the missing probability from a table  Relative frequency so that students know the best estimate comes from the experiment with the most trials. Do an experiment.  Create and complete sample space diagrams and use them to calculate probabilities.  Create and complete tree diagrams for independent events and use them to calculate probabilities. Understand that it is helpful to use sample space diagrams when all the outcomes are equal but if not, tree diagrams are used. | Recap finding probabilities using equally likely outcomes from Year 7  2Know that you can add probabilities of 2 events if they are independent to work out new probability eg the probability of getting green or yellow when choosing counters from a bag. An understanding that you can’t do this to find the probability of prime number or odd number on a dice because they are not ME  Recap relative frequency so that students know the best estimate comes from the experiment with the most trials. Do an experiment.  Create and complete sample space diagrams and use them to calculate probabilities.  Create and complete tree diagrams for independent events and use them to calculate probabilities. Understand that it is helpful to use sample space diagrams when all the outcomes are equal but if not, tree diagrams are used. |

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**Final Topics**

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| --- | --- | --- | --- | --- |
|  | Acquiring | Developing | Securing | Extending |
| Probability | Recap finding probabilities using equally likely outcomes from Year 7  Finding the expected number of successes from an experiment  Find the missing probability from a table  Relative frequency so that students know the best estimate comes from the experiment with the most trials. Do an experiment.  Create and complete sample space diagrams and use them to calculate probabilities. |  |  |  |
| Equation of Straight Lines | Coordinates  Establishing relationships between x and y coordinates of points on a line to create equation Plotting lines (possibly 2 lessons)  Finding equation of lines using gradient and y intercepts (possibly 2 lessons)  Investigating straight lines | Establishing relationships between x and y coordinates of points on a line to create equation  Plotting lines (possibly 2 lessons)  Finding equation of lines using gradient and y intercepts (possibly 2 lessons)  Checking if points are on lines  Gradients of parallel lines | Establishing relationships between x and y coordinates of points on a line to create equation  Plotting lines  Finding equation of lines using gradient and y intercepts  Checking if points are on lines  Solving linear simultaneous equations graphically Investigating parallel and perpendicular lines | Establishing relationships between x and y coordinates of points on a line to create equation  Plotting lines  Finding equation of lines using gradient and y intercepts  Checking if points are on lines  Solving linear simultaneous equations graphically  Investigating parallel and perpendicular lines |
| Angles | Revision of angles on straight lines, in triangles, at a point etc  Angles on parallel lines  Lots of problem solving with all of these and students having to write reasons | Revision of angles on straight lines, in triangles, at a point etc  Proofs  Angles on parallel lines  Angles in polygons  Lots of problem solving with all of these and students having to write reasons. | Revision of angles on straight lines, in triangles, at a point etc  Proofs  Angles on parallel lines  Angles in polygons  Lots of problem solving with all of these and students having to write reasons. | Revision of angles on straight lines, in triangles, at a point etc Proofs  Angles on parallel lines  Angles in polygons  Lots of problem solving with all of these and students having to write reasons. |
| Enlargements |  | Establish what enlargement means in mathematics compared to the description in “normal life”. Useful to use a dictionary definition and a maths dictionary definition.  Enlarge shapes without a scale factor given centre of enlargement and identify scale factor  Enlarge shapes using a centre of enlargement and describe enlargements using C of E and SF for positive integer SF.  Enlarge shapes using a centre of enlargement and describe enlargements using C of E and SF for fractional positive SF  Link enlargements with similar triangles, basic questions on finding missing sides. | Establish what enlargement means in mathematics compared to the description in “normal life”. Useful to use a dictionary definition and a maths dictionary definition.  Enlarge shapes without a scale factor given centre of enlargement and identify scale factor  Enlarge shapes using a centre of enlargement and describe enlargements using C of E and SF for positive integer SF. Link SF to ratio  Enlarge shapes using a centre of enlargement and describe enlargements using Cof E and SF for fractional positive SF, then negative integer SF and time permitting negative fractional SF. Link to ratio for positive SF  Link enlargements with similar triangles, basic questions on finding missing sides. | Establish what enlargement means in mathematics compared to the description in “normal life”. Useful to use a dictionary definition and a maths dictionary definition.  Enlarge shapes without a scale factor given centre of enlargement and identify scale factor  Enlarge shapes using a centre of enlargement and describe enlargements using Cof E and SF for positive integer SF. Link SF to ratio  Enlarge shapes using a centre of enlargement and describe enlargements using Cof E and SF for fractional positive SF, then negative integer SF and time permitting negative fractional SF. Link to ratio for positive SF |
| Similar and Congruent Triangles |  |  |  | Building on last week’s work establish that you can decide shapes are similar if the scale factors of all pairs of corresponding sides are equal or all the angles are equal. Decide if shapes are similar by checking these 2 conditions  Move onto finding sides of missing shapes by first finding the scale factor of enlargement.  Discuss what congruency means  Establish the conditions of congruency by constructing triangles discover that SSS, SAS, RHS and ASA are conditions of congruency for triangles or by another method. Emphasise that AAA is a condition for similarity.  Identify whether pairs of triangles are congruent and if so decide which condition is true.  Finding missing angles or sides in congruent triangles  Time permitting some easy proofs of congruent triangles from GCSE |
| Ratio and Proportion | Writing ratios from word or diagrams  Simplifying ratio  Equivalent Ratio  Diving amounts in given ratio  Proportion Questions | Revise simplifying ratios include questions with different units eg 2kg: 300g  Use equivalent ratios to find missing values  Dividing an amount by a ratio, include eg A and B get some money in the ratio 2:5. B gets £150 more than A how much did they each get. (might need 2 lessons with the problem solving)  Converting ratio to fractions Proportion questions– including recipes using a multiplier as well as unitary method | Revise simplifying ratios include questions with different units eg 2kg: 300g  Write ratios in unitary form  Use equivalent ratios to find missing values  Dividing an amount by a ratio, include eg A and B get some money in the ratio 2:5. B gets £150 more than A how much did they each get.  Converting ratio to fractions  Proportion questions– including recipes using a multiplier as well as unitary method | Revise simplifying ratios include questions with different units eg 2kg: 300g  Write ratios in unitary form  Use equivalent ratios to find missing values  Combining two ratios into one ratio  Dividing an amount by a ratio, include eg A and B get some money in the ratio 2:5. B gets £150 more than A how much did they each get.  Converting ratio/fractions/%  Proportion questions– including recipes using a multiplier as well as unitary method |
| Transformations | Drawing reflections when given a line or in x or y axis  Drawing in lines of symmetry and describing reflections when shape has been reflected in the x or y axis  Rotating shapes  Describing rotations  Translating shapes and describing translations  If time, enlargements without centre of enlargement and integer scale factors |  |  |  |