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

**Assessment 1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Acquiring | Developing | Securing | Extending |
| Rounding | Place valueRounding to 1 decimal placeRounding 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 squaresArea of trianglesArea of parallelogramsProblem solving, working backwards and functional problems. | Revision of areas of rectangles, squares, triangles and parallelogramsArea 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 floorboardsCircumferences of Circles Area of circlesProblem 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 floorboardsCircumferences 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 floorboardsCircumferences of Circles and perimeters of sectors and compound shapes including circles and working backwards Areas of circles, sectors and compound shapes including circles and sectorsVolumes of cuboids, triangular prisms and cylinders and working backwards to find lengths given volumeSurface 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 linkMove 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 fractionsChanging top heavy to mixed numbersTeach 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 $\frac{5}{7}$ or $\frac{7}{5} $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 $\frac{5}{7}$ or $\frac{7}{5} $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 amountsPercentage increase and decreaseProblem 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 calculatorFind percentages of amounts with and without a calculatorPercentage change – including loss and profitProblem solving questions involving FDP | Revisit relationships between F/D/P and be able to confidently change between the 3 with and without a calculatorFind fractions of amounts with and without a calculatorFind percentages of amounts with and without a calculatorPercentage change – including loss and profitProblem 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 profitSimple interestCompound interest and understanding the difference between simple and compound interestOriginal Quantity/Reverse percentages -may be useful to use bar modelling for this. |
| Representing Data | Testing a hypothesisCollecting and grouping data and types of data  Interpret bar chartsConstructing and InterpretingStem and Leaf diagramsConstructing Pie chartsInterpreting Scatter Diagrams | Testing a hypothesisCollecting and grouping data and types of data Interpret bar chartsConstructing and Interpreting Stem and Leaf diagramsPie chartsScatter Diagrams | Testing hypothesisCollecting and grouping data and types of data interpret bar chartsConstructing and Interpreting Stem and Leaf diagramsPie chartsScatter Diagrams | Testing hypothesisCollecting and grouping data and types of data Constructing and Interpreting back to back Stem and Leaf diagramsPie charts focus on interpetingScatter DiagramsConstructing and Interpreting Box plots |
| Volume | Volume of cuboids/cubes/triangular prisms including working backwards and problem solvingVolume of cylinders Volume of prisms e.g. L/T shapes including working backwards and problem solvingFunctional GCSE volume problemsIf time Plans and elevations | Volume of cuboids/cubes/triangular prisms including working backwards and problem solvingVolume of cylinders if possible working backwards and problem solvingVolume of prisms e.g. L/T shapes including working backwards and problem solvingFunctional GCSE volume problemsIf time Plans and elevations | Volume of cuboids/cubes/triangular prisms including working backwards and problem solvingVolume of prisms e.g. L/T shapes including working backwards and problem solvingFunctional GCSE volume problemsNets Plans and elevationsChanging metric volume units |  |

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| Indices (& BIDMAS) |  | Brief recap on square and cube numbers and roots.  Knowing and using that $x^{-a}$ = $\frac{1}{x^{a}} $ Knowing and using the rules of indices $x^{a}×x^{b}=x^{a+b}$,   $x^{a}÷x^{b}=x^{a-b}$ and $(x^{a})^{b}$ = $x^{ab}$ BIDMAS | Brief recap on square and cube numbers and roots.  Knowing and using that $x^{-a}$ = $\frac{1}{x^{a}} $Knowing and using the rules of indices $x^{a}×x^{b}=x^{a+b}$,   $x^{a}÷x^{b}=x^{a-b}$ and $(x^{a})^{b}$ = $x^{ab}$BIDMAS | Brief recap on square and cube numbers and roots. Know and use the fact if x2 = 9 then x = $\pm $ 3 Knowing and using that $x^{-a}$ = $\frac{1}{x^{a}} , x^{\frac{1}{2}}$ = $\sqrt{x}$$x^{\frac{1}{3}}$ =$\sqrt[3]{x}$ and the reciprocal of a numberKnowing and using the rules of indices $x^{a}×x^{b}=x^{a+b}$, $x^{a}÷x^{b}=x^{a-b}$ and $(x^{a})^{b}$ = $x^{ab}$ |
| 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 numbersOrder numbers given in standard formAdd and multiply in standard form without a calculatorMultiply and divide in standard form without a calculator – build on rules of indicesLearn how to use a calculator to input numbers in standard formLearn 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 CubesBIDMAS | Investigate number patterns ie odds, evens, multiples and factorsFind square and cubes of numbers including calculator workWork backwards to find square and cube rootsBIDMAS – basic calculations | Recap on square and cube numbers and roots – involve calculator workRevision of factors and multiplesLCM and HCFBIDMAS |  |  |
| Averages | Recap of averagesFinding missing values from a set of data given eg averageCalculations from frequency tablesComparing data  | Recap of averagesFinding missing values from a set of data given eg averageCalculations with means – given the mean for 10 students and then an extra students data is added what is the new meanCalculations from frequency tables | Recap of averagesFinding missing values from a set of data given eg averageCalculations with means – given the mean for 10 students and then a extra students data is added what is the new meanCalculations from frequency tables | Recap of averagesFinding missing values from a set of data given eg averageCalculations 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 anglesConstructing triangles  | Bearings – define bearings, draw, measure, find from non-accurate diagramsFind bearings from A to B and B to AConstructing trianglesConstructions – see all in left column Scale drawings – including angles of elevation and depressionfunctional questions on scale drawings | Bearings – define bearings, draw, measure, find from non-accurate diagrams Find bearings from A to B and B to AConstructions – see all in left columnScale drawings – including angles of elevation and depressionFunctional questions on scale drawings |  Bearings – define bearings, draw, measure, find from non accurate diagrams Find bearings from A to B and B to AConstructions – see all in left columnLoci – see all in left columnProblem solving with lociScale drawings – could include angles of elevation and depression |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Pythagoras |  |  | Introduce Pythagoras’ theorem Demonstration/Proof of Pythagoras – just to give students an understanding of what proof isApplications of PythagorasConverse of theorem – checking whether a triangle is right angled from the measurements givenUsing Pythagoras’ theorem with isosceles triangles | Revision of basic application of theorem including Pythagorean triplesApplications of Pythagoras – including using isosceles trianglesConverse 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 isRepeated applications of Pythagoras – two triangles togetherPythagoras in 3D |
| Money Calculations and Best Buy | Recap work with decimalsAddition and subtraction questions using money/getting change etcMultiplying an integer by a decimal to find cost of multiple itemsDivide values to find out of prices of single itemsCalculator work on money calculationsBest buy problems |  |  |  |
| Directed Number |  | Adding and Subtracting negative numbers Multiplying and dividing negative numbers Using negative numbers in contextual questions with BIDMASSubstitution |  |  |

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**Assessment 4**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Acquiring  | Developing | Securing | Extending |
| Directed Number | Adding and Subtracting negative numbersMultiplying and dividing negative numbersUsing negative numbers in contextual questions with BIDMASSubstitution |  |  |  |
| Algebra | Revision of simplifying expressionsExpanding brackets -see all types in left column. Then expand and simplifySolving equations with brackets up to 3 steps, include fraction solutionsGenerate sequences from nth termsFinding nth terms | Revision of simplifying expressionsExpanding brackets -see all types in left column. Then expand and simplifySolving equations with brackets up to 3 steps, include fraction solutionsCreating and solving equations.InequalitiesSolving inequalitiesFinding nth terms | Revision of simplifying expressionsExpanding brackets -see all types in left column. Then expand and simplifySolving equations with brackets up to 3 steps, include fraction solutionsCreating and solving equations.InequalitiesSolving inequalitiesFinding nth termsUsing nth terms to solve problems | Revision of simplifying expressionsExpanding brackets -see all types in left column. Then expand and simplifySolving equations with brackets up to 3 steps, include negative and non-integer solutionsCreating and solving equations.Solving equations with non-integer coefficients of x.Recap of Inequalities, then solving inequalitiesFinding and using nth termsUsing simple iterative formulae |
| Probability |  | Recap finding probabilities using equally likely outcomes from Year 7Finding the expected number of successes from an experimentFind 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 7Finding the expected number of successes from an experimentFind 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 72Know 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 MERecap 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 7Finding the expected number of successes from an experimentFind 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 equationPlotting lines (possibly 2 lessons)Finding equation of lines using gradient and y intercepts (possibly 2 lessons)Checking if points are on linesGradients of parallel lines | Establishing relationships between x and y coordinates of points on a line to create equation Plotting linesFinding equation of lines using gradient and y interceptsChecking 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 equationPlotting linesFinding equation of lines using gradient and y interceptsChecking if points are on linesSolving linear simultaneous equations graphicallyInvestigating parallel and perpendicular lines |
| Angles | Revision of angles on straight lines, in triangles, at a point etc  Angles on parallel linesLots 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 ProofsAngles on parallel linesAngles in polygonsLots 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 ProofsAngles on parallel linesAngles in polygonsLots 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 linesAngles 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 factorEnlarge 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 SFLink 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 factorEnlarge shapes using a centre of enlargement and describe enlargements using C of E and SF for positive integer SF. Link SF to ratioEnlarge 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 SFLink 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 factorEnlarge shapes using a centre of enlargement and describe enlargements using Cof E and SF for positive integer SF. Link SF to ratioEnlarge 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 conditionsMove onto finding sides of missing shapes by first finding the scale factor of enlargement. Discuss what congruency meansEstablish 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 trianglesTime permitting some easy proofs of congruent triangles from GCSE |
| Ratio and Proportion | Writing ratios from word or diagramsSimplifying ratioEquivalent RatioDiving amounts in given ratioProportion Questions | Revise simplifying ratios include questions with different units eg 2kg: 300gUse equivalent ratios to find missing valuesDividing 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 formUse equivalent ratios to find missing valuesDividing 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 formUse equivalent ratios to find missing valuesCombining two ratios into one ratioDividing 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 axisDrawing in lines of symmetry and describing reflections when shape has been reflected in the x or y axisRotating shapesDescribing rotations Translating shapes and describing translationsIf time, enlargements without centre of enlargement and integer scale factors |  |  |  |