

APPLICATION OF NUMBER/NUMERACY/MATHEMATICS: DfES

National Curriculum Level 6	Adult Numeracy Level 2	Key Skill - Level 2- N2.1 Part A Part B		GCSE
Mathematics has 4 Attainment Targets (but these do not correspond exactly to the Key Skills components)	Understanding and using mathematical information	For Part B: Carry out at least one activity that includes tasks for all three of N2.1, N2.2 (a or b or c or d) and N2.3. Overall, through one or more activities you must: use two different sources which include material containing a chart or graph (N2.1); do calculations for a, b, c and d (N2.2); present findings in two different ways using charts, graphs or diagrams (N2.3).		AO1 Using and applying mathematics (assessed in contexts provided by the following objectives) AO2 Number and algebra AO3 Shape, space and measures AO4 Handling data
1 Using and applying mathematics Pupils carry through substantial tasks and solve quite complex problems by independently breaking them down into smaller, more manageable tasks. They interpret discuss and synthesise information presented in a variety of mathematical forms. Pupil's writing explains and informs their use of diagrams. Pupils are beginning to give mathematical justifications.	<p>Read and understand mathematical information used for different purposes and independently select and compare relevant information from a variety of graphical, numerical and written material.</p> <p>Specify and describe a practical activity, problem or task using mathematical information and language to increase understanding and select appropriate methods for carrying through a substantial activity.</p> <p><u>An adult is expected to:</u></p> <ul style="list-style-type: none"> • use numbers, fractions, decimals and percentages in the context of measures, estimating amounts and proportions, and make accurate observations • use shape and space to record relevant measurements and make accurate observations • use discrete and continuous data from tables, charts, diagrams and line graphs • collect and record discrete and continuous data in tests and observations • design appropriate methods • select and use appropriate mathematical tests, skills or concepts • recognise that substantial activities should be broken down into smaller, more manageable tasks. 	<p>Interpret information</p> <ul style="list-style-type: none"> • get relevant information from different sources (e.g. from written and graphical material, first-hand by measuring or observing) • read and understand tables, charts, graphs and diagrams • read and understand numbers used in different ways, including negative numbers (e.g. <i>for losses in trading, low temperatures</i>) • estimate amounts and proportions • read scales on a range of equipment to given levels of accuracy (e.g. <i>to the nearest 10mm or nearest inch</i>) • make accurate observations (e.g. <i>count the number of customers per hour</i>) • select appropriate methods to get the results you need, including grouping data when this is appropriate (e.g. <i>heights, salary bands</i>). 	<p>N2.1 Interpret information from a suitable source</p> <p>2.1.1 choose how to get the information you need to meet the purpose of your activity</p> <p>2.1.2 obtain relevant information</p> <p>2.1.3 choose appropriate methods to get the results you need.</p>	<hr/> <p>Grade C (extract): AO1 Using and applying mathematics: Starting from problems or contexts that have been presented to them, candidates refine or extend the mathematics used to generate fuller solutions. They give a reason for their choice of mathematical presentation, explaining features they have selected. Candidates justify their generalisations, arguments or solutions, showing some insight into the mathematical structure of the problem. They appreciate the difference between mathematical explanation and experimental evidence.</p>
		<p>Part C: Guidance: Use information from different sources – written and graphical material, read and understand numbers used in different ways, such as losses in trading, low temperatures. Estimate, read scales, make observations, group data such as heights, salary bands.</p>		

Nat. Curriculum Level 6	Adult Numeracy Level 2 Calculating & manipulating mathematical information	Key Skill - Level 2 -N2.2		GCSE
		Part A	Part B	
<p>2 Number & Algebra Order & approximate decimals when solving numerical problems and equations [e.g. $x+3+x=20$], using trial and improvement methods. Aware of which number to consider as 100%, or a whole, in problems involving comparisons, and use this to evaluate one number as a fraction or % of another. Understand and use the equivalences between fractions, decimals and %, and calculate using ratios in appropriate situations. + and - fractions by writing them with a common denominator. When exploring number sequences, find and describe in words the rule for the next term or nth term of a sequence where the rule is linear. Formulate and solve linear equations with whole number coefficients. Represent mappings expressed algebraically, and use Cartesian coordinates for graphical representation. interpreting general features.</p> <p>3Shape,space,measures Recognise & use common 2D representations of 3D objects. Know and use properties of quadrilaterals in classifying different types of quadrilateral. Solve problems using angle and symmetry properties of polygons and angle properties of intersecting & parallel lines & explain properties. Devise instructions for a computer to generate and transform and use appropriate formulae for finding circumferences & areas of circles, areas of plane rectilinear figures & volumes of cuboids when solving problems. Enlarge shapes by positive whole number scale factor.</p>	<p>Adults can: generate results to an appropriate level of accuracy using methods, measures and checking procedures appropriate to the specified purpose.</p> <hr/> <p>An adult is expected to:</p> <p>Use whole numbers: to read, write, order and compare positive and negative numbers of any size in a practical context, e.g. <i>loss in trading, low temperatures</i>; to carry out calculations with numbers of any size using efficient methods; to calculate ratio and direct proportion, e.g. 3:2; to evaluate expressions and make substitutions in given formulae in words & symbols to produce results, e.g. <i>area of room from $l \times w$</i></p> <p>Use fractions: to order and compare amounts or quantities; to identify equivalencies with decimals and percentages; to evaluate one number as a fraction of another; to add and subtract amounts or quantities.</p> <p>Use decimals: to order, approximate and compare decimals when solving practical problems to add, subtract, multiply and divide decimals up to three places.</p> <p>Use percentages: to order and compare percentages and understand percentage increase and decrease, e.g. <i>VAT or 20 per cent reduction in a sale</i>; to find percentage parts of quantities and measurements to evaluate one number as a percentage of another.</p> <p>Use measures: to calculate with sums of money and to convert between currencies; to calculate, measure and record time in different formats; to estimate, measure and compare length, weight, capacity and temperature using metric and, where appropriate, imperial units, e.g. scales to given levels of accuracy, including reading <i>between divisions</i>; to calculate with units: within the same system, between systems using conversion tables and scales, and approximate conversion factors, e.g. <i>1kg = 2.2lbs, 1in = 2.54cm</i>; to understand and use given formulae for finding: perimeters and areas of regular shapes, e.g. <i>rectangular and circular surfaces</i>, areas of composite shapes, e.g. <i>non-rectangular rooms or plots of land</i>, volumes of regular shapes, e.g. <i>cuboid or cylinder</i>; to work out dimensions from scale drawings, e.g. 1:20.</p> <p>Use shape and space: to recognise and use common 2-D representations of 3-D objects, e.g. <i>in maps and plans</i>; to solve problems involving 2-D shapes and parallel lines, e.g. <i>in laying down carpet tiles</i>.</p> <p>Use electronic or mechanical aids: to calculate efficiently using whole numbers, fractions, decimals, percentages; to check calculations.</p>	<p>Carry out calculations</p> <ul style="list-style-type: none"> carry out calculations involving two or more steps, with numbers of any size with and without a calculator show clearly your methods of carrying out calculations and give the level of accuracy of your results work with and convert between fractions, decimals and percentages convert measurements between systems (e.g. <i>from pounds to kilograms, between currencies</i>) work out areas and volumes (e.g. <i>area of an L-shaped room, number of containers to fill a given space</i>) work out dimensions from scale drawings (e.g. <i>using a 1:20 scale</i>) use proportion and calculate using ratios where appropriate compare sets of data of an appropriate size such as 20 items each (e.g. <i>using percentages, using mean, median, mode</i>) use range to describe the spread within sets of data understand and use given formulae (e.g. <i>for calculating volumes, areas such as circles, insurance premiums, $V=IR$ for electricity</i>) check your methods in ways that pick up faults and make sure your results make sense. 	<p>N2.2 Use your information to carry out calculations to do with:</p> <p>a amounts or sizes</p> <p>b scales or proportion</p> <p>c handling statistics</p> <p>d using formulae.</p> <p>2.2.1 carry out calculations, clearly showing your methods and levels of accuracy</p> <p>2.2.2 check your methods to identify and correct any errors, and make sure your results make sense.</p>	<p>Grade C (extract):</p> <p>AO2 Number and algebra In making estimates, round to one significant figure and multiply and divide mentally. Solve numerical problems involving multiplication and division with numbers of any size using a calculator efficiently and appropriately. Understand the effects of multiplying and dividing by numbers between 0 and 1. Understand and use the equivalences between fractions, decimals and percentages and calculate using ratios in appropriate situations. Understand and use proportional changes. Find and describe in symbols the next term or the nth term of a sequence, where the rule is quadratic; they multiply two expressions of the form $(x + n)$; they simplify corresponding quadratic expressions. Solve simple polynomial equations by trial and improvement and represent inequalities using a number line. Formulate and solve linear equations with whole number coefficients. Manipulate simple algebraic formulae, equations and expressions. Use algebraic and graphical methods to solve simultaneous linear equations in two variables.</p> <p>AO3 Shape, space & measures Solve problems using angle and symmetry properties of polygons and properties of intersecting and parallel lines. Understand and apply Pythagoras' Theorem when solving problems in two-dimensions. Find areas and circumferences of circles. Calculate lengths, areas and volumes in plane shapes and right prisms. Enlarge shapes by a positive whole number or fractional scale factor. Appreciate 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. Understand and use compound measures such as speed.</p> <p><i>Handling data on table below....</i></p>
		<p>Part C Guidance: Carry out calculations involving at least two steps, using numbers of any size, use decimals, fractions and percentages. Convert from one measuring system to another, such as from pounds to kilograms. Compare data, use range to describe the spread of sets of data. For instance using mean, median and mode. Use formulae for working out things such as areas, volumes.</p>		

Nat. Curriculum Level 6	Adult Numeracy Level 2 Calculating and manipulating mathematical information <i>cont...</i>	Key Skill - Level 2		GCSE
<p>4 Handling data Collect and record continuous data, choosing appropriate equal class intervals over a sensible range to create frequency tables. Construct and interpret frequency diagrams. Construct pie charts. Draw conclusions from scatter diagrams, and have a basic understanding of correlation. When dealing with a combination of two experiments, identify all the outcomes, using diagrammatic, tabular or other forms of communication. In solving problems, use their knowledge that the total probability of all the mutually exclusive outcomes of an experiment is 1.</p>	<p>Use data and statistical measures: to extract discrete and continuous data from tables, charts, diagrams and line graphs; to collect, organise and represent discrete and continuous data in tables, charts, diagrams and line graphs; to find the mean, median and mode and use them as appropriate to compare two sets of data; to find the range and use it to describe the spread within sets of data.</p> <p>Use probability: to identify the range of possible outcomes of combined events and record information using diagrams or tables.</p>	<p>For Part B: Carry out at least one activity that includes tasks for all three of N2.1, N2.2 (a or b or c or d) and N2.3. Overall, through one or more activities you must: use two different sources which include material containing a chart or graph (N2.1); do calculations for a, b, c and d (N2.2); present findings in two different ways using charts, graphs or diagrams (N2.3)</p>		<p>Grade C (extract): AO4 Handling data Candidates construct and interpret frequency diagrams. They specify hypotheses and test them. They determine the modal class and estimate the mean, median and range of a set of grouped data, selecting the statistic most appropriate to their line of enquiry. They use measures of average and range with associated frequency polygons, as appropriate, to compare distributions and make inferences. They draw a line of best fit on a scatter diagram by inspection. Candidates understand relative frequency as an estimate of probability and use this to compare outcomes of experiments.</p>
	<p>Interpreting results & communicating mathematical information</p>	<p>Key Skill - Level 2 - N2.3</p> <p>Part A Part B</p>		<p>GCSE: References to presentation drawn from the Grade C description – using and applying mathematics [no specific Assessment Objective for presenting]</p>
	<p>Adults can: present and explain results clearly and accurately using numerical, graphical and written formats appropriate to purpose, findings and audience.</p> <p><i>An adult is expected to:</i> Use whole numbers, common fractions, decimals and percentages to present results; Select and use measures and units of measure to define quantities; Use tables, charts, diagrams and line graphs to draw conclusions and present results, <i>e.g. for amounts, sizes, scales and statistics</i>; Use approximation to corroborate and confirm results; select and use appropriate methods and forms to present and explain outcomes.</p>	<p>Interpret results and present your findings</p> <ul style="list-style-type: none"> select effective ways to present your findings construct and use tables, charts and graphs and label with titles, scales, axes, and keys, as appropriate highlight the main points of your findings and describe your methods describe what your results tell you and how they meet your purpose. 	<p>N2.3 Interpret the results of your calculations and present your findings</p> <p>2.3.1 select effective ways to present your findings 2.3.2 present your findings clearly using a chart, graph or diagram and describe your methods 2.3.3 use more than one way of presenting your findings 2.3.4 describe what your results tell you and how they meet your purpose.</p>	<p>They give a reason for their choice of mathematical presentation, explaining features they have selected. Candidates justify their generalisations, arguments or solutions, showing some insight into the mathematical structure of the problem. They appreciate the difference between mathematical explanation and experimental evidence.</p>
<p>Part C Guidance: Use tables, charts and graphs to present information correctly, highlighting your findings and describing your results.</p>				