

# National Added Value Unit Specification



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**Unit title:** Lifeskills Mathematics Test (National 4)

**SCQF:** level 4 (6 SCQF credit points)

**Unit code:** to be advised

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## Unit outline

This is the Added Value Unit of the Lifeskills Mathematics (National 4) Course. The general aim of this Unit is to assess the skills developed within the Lifeskills Mathematics (National 4) Course. It will also assess the ability to perform numerical calculations without the aid of a calculator. Evidence for this Unit will be generated through successful achievement in a test which will allow the learner to demonstrate breadth and application.

Breadth and application will be demonstrated through the use of mathematical ideas and strategies that can be applied to organising and planning straightforward aspects in personal life, the workplace and the wider world. This will include the application of financial, measurement, geometric and statistical skills in real-life contexts involving reasoning. Numerical skills underpin all aspects of the Course.

Learners who complete this Unit will be able to:

- 1 Apply mathematical reasoning skills in straightforward real-life contexts

This Unit is a mandatory Unit of the Lifeskills Mathematics (National 4) Course. The Unit Specification should be read in conjunction with the *Course Support Notes* which provide advice and guidance on delivery and assessment approaches. Exemplification of the assessment in this Unit is given in the *National Assessment Resource*.

## Recommended entry

Entry to this Unit is at the discretion of the centre. It is recommended that the learner should be in the process of completing, or have completed, the following Units in the Lifeskills Mathematics (National 4) Course:

- ◆ Lifeskills Mathematics: Personal Mathematics (National 4)
- ◆ Lifeskills Mathematics: Mathematics at Work (National 4)
- ◆ Numeracy (National 4)

## **Equality and inclusion**

This Unit Specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence. For further information please refer to the *Course Support Notes*.

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# Standards

## Outcomes and assessment standards

### Outcome 1

The learner will:

#### 1 Apply mathematical reasoning skills in straightforward real-life contexts by:

- 1.1 Interpreting and solving problems without the use of a calculator
- 1.2 Making decisions involving finance, geometry and measurement
- 1.3 Using number skills and statistics to process and compare data

## Evidence Requirements for the Unit

This Added Value Unit is assessed internally by the teacher/lecturer.

All learners should be provided with a clear outline of the assessment, including when and how they will be assessed.

Evidence for this Unit will be generated through a test in which the learner will draw on and apply skills developed in:

- ◆ Lifeskills Mathematics: Personal Mathematics (National 4)
- ◆ Lifeskills Mathematics: Mathematics at Work (National 4)
- ◆ Numeracy (National 4)

The test, which will assess a selection of knowledge and skills acquired in the Course, will offer opportunities to use skills in a wider scope of situations and sometimes in new contexts. The knowledge and skills to be tested are selected from within the Course. The test will consist of two parts, in one of which a calculator may be used. Both parts of the test will be conducted under closed book conditions.

The first part will consist of short response questions, based on a selection of knowledge and skills developed in the Course, each of which require the use of number processes in contextualised situations.

The questions should cover the following:

- ◆ use of whole number percentages to compare the effect of interest rates on a given amount
- ◆ calculating the mean to two decimal places from a given set of data
- ◆ using a scale factor which is a non-unitary fraction to determine a related measurement
- ◆ calculating the limits of a measurement to one decimal place, using tolerance
- ◆ working with addition and subtraction in a financial problem

In this part a calculator must not be used. The questions should be able to be completed in 20 minutes.

The second part will consist of short and extended response questions based on a selection of knowledge and skills developed in the Course.

The questions should be in a real-life context and cover the following:

- ◆ using area or volume combined with cost options to work out the best deal
- ◆ analysing the income and expenditure of an event to determine its financial position
- ◆ converting between currencies
- ◆ determining net pay given at least four components, one of which requires calculation
- ◆ providing a solution to a basic problem in time management
- ◆ plotting a scattergraph, drawing and using a line of best fit
- ◆ interpreting graphs or charts to compare information and calculate differences
- ◆ calculating a quantity based on a related measurement and a table of information

In this part a calculator can be used. The questions should be able to be completed in 40 minutes.

Evidence is required that the candidate has passed both parts of the test.

Further information is provided in the exemplification of assessment in the *National Assessment Resource*. Advice and guidance on possible approaches to assessment is provided in the *Course Support Notes*.

## **Development of skills for learning, skills for life and skills for work**

Please refer to the Course Specification for information about skills for learning, skills for life and skills for work.

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## Further mandatory information on Course coverage for the Lifeskills Mathematics (National 4) Course

The following gives details of mandatory skills, knowledge and understanding for the Lifeskills Mathematics (National 4) Course. Assessment of this Added Value Unit will involve selecting appropriate skills, knowledge and understanding from those listed below, in line with the Evidence Requirements above. This list of skills, knowledge and understanding also provides the basis for the assessment of all the Units in the Course.

### Section A: Mandatory content for Added Value Unit

Assessment Standard	Explanation of Standard
1.1 Interpreting and solving problems in context without the use of a calculator	<ul style="list-style-type: none"> <li>◆ use of whole number percentages (single digit percentages, multiples of 10%, multiples of 20%, multiples of 25%, 50%)</li> <li>◆ calculating the mean to a given number of decimal places from a given set of data</li> <li>◆ using a scale factor which is a straightforward common fraction to determine a related measurement</li> <li>◆ calculating the limits of a measurement to a given number of decimal places, using tolerance</li> <li>◆ using addition and subtraction of decimal numbers in a financial problem</li> </ul>
1.2 Making decisions involving finance, geometry and measurement	<ul style="list-style-type: none"> <li>◆ using area or volume combined with cost options to work out the best deal — area (circle, parallelogram, kite, trapezium), surface area (prism) or volume (prism)</li> <li>◆ analysing the income and expenditure of an event to determine its financial position as in whether it made a profit or loss; some elements of the income and expenditure should require calculation</li> <li>◆ converting between currencies in either direction</li> <li>◆ determining net pay given at least four components, one of which requires calculation. These should be selected from:               <ul style="list-style-type: none"> <li>— basic pay</li> <li>— overtime</li> <li>— bonus</li> <li>— commission</li> <li>— gross/net pay</li> <li>— benefits and allowances</li> <li>— National Insurance</li> <li>— income tax</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>◆ providing solutions to problems in time management, using time intervals to make plans including across midnight</li> </ul>
1.3 Using number skills and statistics to process and compare data	<ul style="list-style-type: none"> <li>◆ plotting scatter graphs, drawing a line of best fit; using the line of best fit to calculate one variable given the other</li> <li>◆ interpreting graphs or charts to compare information and calculate differences; graphs and charts should include line graphs, pie charts, bar graphs</li> <li>◆ calculating a quantity based on a related measurement and a table of information</li> </ul>

### Section B: Mandatory content for Units

<b>Lifeskills Mathematics: Personal Mathematics (National 4)</b>	
<b>Financial Outcome</b> <i>The learner will use reasoning skills and financial skills linked to straightforward contexts in personal life.</i>	
<b>Assessment Standard</b>	<b>Explanation of Standard</b>
1.1 Determining a financial position, given budget information	Budgeting and planning for personal use or planning a straightforward event  Balancing straightforward incomings and outgoings from a range of sources
1.2 Investigating factors affecting income	Investigate and interpret income and deductions for different personal circumstances and career choices. These should include: <ul style="list-style-type: none"> <li>◆ basic pay</li> <li>◆ overtime</li> <li>◆ bonus</li> <li>◆ commission</li> <li>◆ gross/net pay</li> <li>◆ benefits and allowances</li> <li>◆ National Insurance</li> <li>◆ income tax</li> </ul>
1.3 Determining the best deal, given two pieces of information	Compare at least three products, given two pieces of information on each
1.4 Converting between currencies	Comparing costs between two different currencies in either direction
1.5 Investigating the impact of interest rates for savings and borrowing in a basic situation	These should include: <ul style="list-style-type: none"> <li>◆ loans</li> <li>◆ savings rate</li> <li>◆ bank accounts</li> <li>◆ hire purchase</li> </ul>

<b>Measurement Outcome</b> <i>The learner will use reasoning skills and measurement skills linked to straightforward contexts in personal life.</i>	
2.1 Investigating basic measurements in everyday life	Investigating and understanding basic everyday measurements
2.2 Solving a basic problem in time management	Use time intervals to make plans including across midnight
<b>Statistical Outcome</b> <i>The learner will use reasoning skills and statistical skills linked to straightforward contexts in personal life.</i>	
3.1 Using statistics to investigate risk	Investigate the meaning of lifestyle statistics
3.2 Using and presenting statistical information in diagrams	Using and presenting straightforward statistical diagrams (technology may be used). These should include: <ul style="list-style-type: none"> <li>◆ bar graphs</li> <li>◆ line graphs</li> <li>◆ pie charts</li> <li>◆ frequency tables without class intervals</li> </ul>

<b>Lifeskills Mathematics: Mathematics at Work (National 4)</b>	
<b>Measurement Outcome</b> <i>The learner will use reasoning skills and measurement skills linked to straightforward contexts in the workplace and in the wider world.</i>	
<b>Assessment Standard</b>	<b>Explanation of Standard</b>
1.1 Calculating a quantity based on a related measurement	Any required formula or relationship will be given
1.2 Constructing a scale drawing with a given scale	
1.3 Planning a basic navigation course	Use measurement of angles and length to interpret and to plan a straightforward navigation course
1.4 Carrying out measurements in millimetres	Use millimetres to measure and then record the result, including objects over one metre
1.5 Carrying out container packing, using a first-fit algorithm	Filling containers in the order of arrival
1.6 Considering the effects of tolerance	Accuracy up to two decimal places
<b>Geometric Outcome</b> <i>The learner will use reasoning skills and geometric skills linked to straightforward contexts in the workplace and in the wider world.</i>	
2.1 Determining the gradient of a slope	Using 'vertical height' and 'horizontal distance'
2.2 Investigating a situation involving perimeter	<ul style="list-style-type: none"> <li>◆ rectilinear</li> <li>◆ circular</li> <li>◆ composite shape</li> </ul>

2.3 Investigating a situation involving area	<ul style="list-style-type: none"> <li>◆ triangles</li> <li>◆ kite, rhombus, parallelogram</li> <li>◆ circle</li> <li>◆ composite shape</li> </ul>
2.4 Investigating a situation involving volume	◆ prism (including cuboid, cylinder)
2.5 Solving a problem involving the use of Pythagoras' theorem	
2.6 Using a scale factor on the dimensions of a shape	Problems involving increase/decrease in an amount or measurement according to a scale factor
<b>Statistical Outcome</b> <i>The learner will use reasoning skills and statistical skills linked to straightforward contexts in the workplace and in the wider world.</i>	
3.1 Using diagrams to illustrate data	Bar graphs, line graphs, pie charts, stem and leaf diagrams
3.2 Comparing data sets, using mean and range	Using ungrouped data
3.3 Constructing a frequency table	Without class intervals
3.4 Constructing a scattergraph	From given or gathered data
3.5 Drawing a best fitting straight line on a scattergraph	Drawing a best fitting straight line by eye-estimating one variable, given the other

<b>Numeracy (National 4)</b>	
<b>Numerical Outcome</b> <i>The learner will use numerical skills to solve given, straightforward real-life problems involving money/time/measurement.</i>	
<b>Assessment Standard</b>	<b>Explanation of Standard</b>
1.1 Selecting and using appropriate numerical notation and units	<ul style="list-style-type: none"> <li>◆ Numerical notation should include: =, +, −, ×, /, ÷, &lt;, &gt;, ( ), %, colon and decimal point</li> <li>◆ Units should include: <ul style="list-style-type: none"> <li>— money (pounds and pence)</li> <li>— time (months, weeks, days, hours, minutes, seconds)</li> <li>— measurement of length (millimetre, centimetre, metre, kilometre, mile); weight (gram, kilogram); volume (millilitre, litre) and temperature (Celsius and Fahrenheit)</li> </ul> </li> </ul>

<p>1.2 Selecting and carrying out calculations involving whole numbers, fractions, decimals, percentages, ratio and proportion</p>	<ul style="list-style-type: none"> <li>◆ add and subtract whole numbers including negative numbers</li> <li>◆ multiply whole numbers of any size, with up to four-digit whole numbers</li> <li>◆ divide whole numbers of any size, by a whole number of up to two digits</li> <li>◆ find whole number remainders</li> <li>◆ round answers to the nearest significant figure or two decimal places</li> <li>◆ find simple percentages and fractions of shapes and quantities, eg 50%, 10%, 20% and 25%, 33%; <math>\frac{1}{2}</math>, <math>\frac{1}{3}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{10}</math>, <math>\frac{1}{5}</math></li> <li>◆ calculate percentage increase and decrease</li> <li>◆ convert equivalences between common fractions, decimals and percentages</li> <li>◆ calculate rate: eg miles per hour or number of texts per month</li> <li>◆ calculate distance given speed and time</li> <li>◆ calculate time intervals using the 12- and 24-hour clock</li> <li>◆ calculate volume (cube and cuboid), area (rectangle and square) and perimeter (shapes with straight lines)</li> <li>◆ calculate ratio and direct proportion</li> </ul>
<p>1.3 Reading measurements using a straightforward scale on an instrument</p>	<ul style="list-style-type: none"> <li>◆ use measuring instruments with straightforward scales to measure length, weight, volume and temperature</li> <li>◆ read scales to the nearest marked, unnumbered division with a functional degree of accuracy</li> </ul>
<p>1.4 Interpreting the measurements and the results of calculations to make decisions</p>	<ul style="list-style-type: none"> <li>◆ use appropriate checking methods, eg check sums and estimation</li> <li>◆ interpret results of measurements involving time, length, weight, volume and temperature</li> <li>◆ recognise the inter-relationship between units in the same family, eg mm/cm, cm/m, g/kg, and ml/l</li> <li>◆ use vocabulary associated with measurement to make comparisons for length, weight, volume and temperature</li> </ul>
<p>1.5 Explaining decisions based on the results of calculations</p>	<ul style="list-style-type: none"> <li>◆ give reasons for decisions based on the results of calculations</li> </ul>

**Graphical data Outcome**

*The learner will interpret graphical data and situations involving probability to solve given, straightforward real-life problems involving money/time/measurement.*

2.1 Extracting and interpretation data from at least two different straightforward graphical forms	Straightforward graphical forms should include: <ul style="list-style-type: none"><li>◆ a table with at least four categories of information</li><li>◆ a chart where the values are given or where the scale is obvious, eg pie</li><li>◆ a graph where the scale is obvious, eg bar, pie, scatter or line graph</li><li>◆ a diagram, eg stem and leaf, map or plan</li></ul>
2.2 Making and explaining decisions based on the interpretation of data from straightforward graphical forms	<ul style="list-style-type: none"><li>◆ make decisions based on observations of patterns and trends in data</li><li>◆ make decisions based on calculations involving data</li><li>◆ make decisions based on reading scales in straightforward graphical forms</li><li>◆ offer reasons for the decisions made based on the interpretation of data</li></ul>
2.3 Making and explaining decisions based on probability	<ul style="list-style-type: none"><li>◆ recognise patterns and trends and use these to state the probability of an event happening</li><li>◆ make predictions and use these predictions to make decisions</li></ul>

## Administrative information



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**Superclass:** to be advised

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### History of changes

Version	Description of change	Authorised by	Date

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