

**MATHEMATICS**  
**Access 3**

**Second edition – published November 1999**

**NOTE OF CHANGES TO ARRANGEMENTS  
SECOND EDITION PUBLISHED NOVEMBER 1999**

**CLUSTER TITLE:** Mathematics (Access 3)

**CLUSTER NUMBER:** C056 09

**National Cluster Specification**

Cluster Details: Core skills statements expanded

**National Unit Specification**

All units Core skills statements expanded

## National Cluster

### MATHEMATICS (ACCESS 3)

**CLUSTER NUMBER**            C056 09

#### STRUCTURE

This programme of study has three mandatory units, as follows:

<i>D559 09</i>	<i>Using Mathematics 1 (Acc 3)</i>	<i>1 credit (40 hours)</i>
<i>D560 09</i>	<i>Using Mathematics 2 (Acc 3)</i>	<i>1 credit (40 hours)</i>
<i>D561 09</i>	<i>Using Mathematics 3 (Acc 3)</i>	<i>1 credit (40 hours)</i>

In common with all clusters, this programme of study includes 40 hours over and above the 120 hours for the component units. This may be used for induction, extending the range of learning and teaching approaches, support, consolidation and integration of learning. This time is an important element of the programme of study and advice on its use is included in the cluster details.

#### RECOMMENDED ENTRY

Entry is at the discretion of the centre.

#### CORE SKILLS

This cluster gives automatic certification of the following:

<b>Complete core skills for the cluster</b>	Numeracy	Acc 3
<b>Additional core skills components for the cluster</b>	Critical Thinking	Acc 3

For information about the automatic certification of core skills for any individual unit in this cluster, please refer to the general information section at the beginning of the unit.

Additional information about core skills is published in *Automatic Certification of Core Skills in National Qualifications* (SQA, 1999).

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#### Administrative Information

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<b>Source:</b>	Scottish Qualifications Authority
<b>Version:</b>	02

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## National Cluster: details

### CLUSTER Mathematics (Access 3)

#### RATIONALE

‘Positive attitudes and awareness not only aid mathematical learning, but are developed through achieving success and satisfaction in that learning. They will, therefore, be inextricably linked with the various attainment outcomes described.’

(5-14 Guidelines in Mathematics, 1991)

The emphasis of the Access units in mathematics is based on the above. Each unit builds upon and extends the candidates’ mathematics, demonstrating that these mathematical skills are connected and relevant to everyday situations. The teaching progression should be paced to ensure success.

At this level, it is crucial that the mathematics be considered in context to reinforce its usefulness. The use of mathematical techniques should be applied in social and vocational contexts related to likely future life, work or study. The use of the mathematics in the units *Using Mathematics 1 (Acc 3)*, *2 (Acc 3)* and *3 (Acc 3)* can be illustrated in contexts such as shopping, holidays and budgets which candidates will readily find relevant. Using such contexts, the mathematics should progress to solving problems which require the integration of these skills.

As candidates progress through the cluster there is an increased emphasis on the solution of problems, allowing the units to contribute to other areas of learning, to communication skills, to creative thinking and to personal and social development.

#### CONTENT

The overall aim of mathematics provision at Access 3 level is to build confidence in the use of mathematical processes by demonstrating their relevance to everyday situations. Placing mathematical knowledge and skills in contexts which candidates can relate to should stimulate interest and encourage candidates to extend their mathematical experience. The content of the cluster is designed to enable candidates to practise basic skills of computation, measurement and interpretation of information in everyday contexts.

Each of the three units at Access 3 has outcomes in basic number, information handling and measurement. Money outcomes span the first two units. Properties of shape in Unit 3, is the only outcome which does not span at least two units. The close connecting structure of the units at this level provides incremental progress in these basic themes for candidates taking the cluster.

Undertaking the units as a cluster offers a number of benefits:

- the balance and breadth of candidates’ experiences and learning will be promoted
- both specific skills and core skills may be explored and developed
- practical and applied activities can be integrated
- skills and abilities developed through integrated practical activities will support learning as a whole
- candidates’ abilities to sustain effort and concentration, come to conclusions, make decisions, complete a process and evaluate their work are developed

## **National Cluster: details (cont)**

### **CLUSTER            Mathematics (Access 3)**

Where appropriate, mathematical topics should be taught, and skills in applying mathematics developed through real-life contexts. Candidates should be encouraged throughout each unit to make use of their skills in mental calculation, to make efficient use of calculators and to apply the strategy of checking.

Numerical checking or checking a result against the context in which it is set is an integral part of every mathematical process. In many instances, the checking can be done mentally, but on occasions, to stress its importance, there should be evidence of a checking procedure within the calculation. There are various checking procedures which could be used:

- relating to a context – ‘How sensible is my answer?’
- estimate followed by a repeated calculation
- calculation in a different order

In the statement of particular performance criteria within the units there is a reference to appropriate checking, and candidates will be required to provide evidence of a checking procedure having been used.

## National Cluster: details (cont)

### CLUSTER Mathematics (Access 3)

The content listed below should be covered in teaching the units. Where comment is offered, this is intended to help in the effective teaching of the units.

Mental, pencil and paper and calculator computation should be employed as appropriate to the context and the computational ability of the candidate. Necessary checking procedures should be emphasised.

CONTENT	COMMENT	APPROACHES
<p><b>Using Mathematics 1 (Acc 3)</b></p> <p><b>The four operations with whole numbers</b> add and subtract whole numbers in context, for whole numbers up to four digits.</p>	<p>eg Lisa wants three wooden shelves, 1320mm, 1440mm and 1550mm in length. What is the total length of wood required? The supplier only has 5000mm lengths of wood, what length of wood will be left after the three shelves have been cut from one 5000mm length?</p> <p>eg The two curtains covering the lounge window need replacing. Each curtain requires 214cm of material. How much material is needed to replace the pair of curtains? How much material will be left over from a 500cm piece of material?</p> <p>eg On holiday, the Fraser family drive 30 miles to Fort Augustus, then 34 miles on to Inverness, and finally 58 miles up to Ullapool. How far is their total journey? They stop for a break 16 miles before Ullapool, how far have they travelled up to that point?</p>	<p>The emphasis in this unit is on calculations within a context. The contexts should be varied.</p> <p>Candidates will have to be able to recognise which operation to apply. Within this topic, candidates should be given experience of calculations without a calculator.</p>



## National Cluster: details (cont)

### CLUSTER Mathematics (Access 3)

CONTENT	COMMENT	APPROACHES
<p><b>Money</b> add and subtract money in applications up to £100</p> <p>know the meaning of the term discount, ie, discount is subtracted</p> <p>know the meaning of VAT, ie, VAT is added on</p> <p>multiplication and division in money in applications up to £100</p> <p>interpret calculator display in the context of money</p>	<p>eg Ryan buys a video for £13.95 and some popcorn for £1.89. How much is he charged? How much change does he get from £20? eg Saving money, bills.</p> <p>eg Buying and selling, special offers.</p> <p>eg Jamie's meal costs £22.00, the VAT is £3.85. What is his final bill? eg Shopping, meals out, accommodation bills, telephone bills, car hire, car repair and quotes for work, such as decorating.</p> <p>eg The total cost of a meal for three friends was £30.60. If they share the cost equally what does each one pay? eg A butcher sells sausages at £1.35 per kg. What would 4kg of sausages cost?</p> <p>eg 2.4 as £2.40 and 2.05 as £2.05.</p>	<p>Able candidates should be extended towards the content of Mathematics 1 (Int 1), eg 'find a percentage of a quantity' and 'discounts and VAT' from Basic calculations and 'calculations involving money in appropriate social contexts' from Calculations in everyday contexts.</p> <p>It is assumed here that discount and VAT would be given as amounts of money, ie there would be no need for a percentage calculation. Again, extend able candidates towards Mathematics 1 (Int 1) as above.</p> <p>In assessments, answers should not require rounding. However, candidates should be made aware of the need to round in practical situations. This skill will be developed further within Using Mathematics 2 (Acc 3).</p>

## National Cluster: details (cont)

**CLUSTER** Mathematics (Access 3)

CONTENT	COMMENT	APPROACHES
<p><b>Interpretation of information</b> Interpret information presented in a table, where the table has up to two categories of data communicate information in a simple table</p> <p>interpret information presented in a pictograph</p> <p><b>Measure</b> select appropriate measuring units for length (millimetre, centimetre, metre, kilometre, mile)</p>	<p>Examples of tables could include simple holiday brochures, calendars. eg Fill out a day planner for two - three people given details, and organise or arrange for them to attend a meeting together.</p> <p>eg From a pictograph in a newspaper identify least and most frequent items.</p> <p>eg Know that long distances will be measured in miles or km and smaller ones in m, cm, and that for accurate measurements mm are commonly used. eg Donna is travelling from Perth to Aberdeen, what unit would she use to estimate the distance to be travelled?</p>	<p>Candidates could be provided with the opportunity to construct their own pictographs, if possible using a software data-handling package.</p> <p>Although candidates will not be assessed on the selection of the appropriate measuring instrument, this should form a natural part of the teaching. Useful knowledge should include: knowing that 10mm = 1cm, 100cm = 1m, 1000m = 1km.</p> <p>Candidates should estimate length and height in easily handled standard units, eg a card is between 40mm and 50mm wide, a table mat is around 30cm wide, a table is less than 1m high and between 1m and 1<sup>1</sup>/<sub>2</sub>m long.</p>

## National Cluster: details (cont)

### CLUSTER Mathematics (Access 3)

CONTENT	COMMENT	APPROACHES
<p><b>Measure (cont)</b> measure to a required degree of accuracy in millimetres, centimetres and metres</p> <p><b>Using Mathematics 2 (Acc 3)</b></p> <p><b>Numbers – Calculations in everyday contexts</b> add and subtract numbers in context, including money and measurement</p>	<p>Measure large objects in mm, eg a table is 800mm wide by 1200mm long. Centimetres to be measured to the nearest cm. For small objects, accuracy should be <math>\pm 2</math> millimetres.</p> <p>eg Deductions, wageslips, shopping bills, household bills, profit or loss, kitchen units in mm, etc.</p>	<p>The emphasis should be on developing practical skills. It is important that candidates become familiar with the use of millimetres as they are a commonly used unit of measurement in industry. Candidates need to be aware of the practical implications of rounding. In assessments, answers should not require rounding.</p> <p>Where possible, link into work in other areas of the curriculum such as, Design, Engineering and Technology, Home Economics, Food Technology, Geography, etc.</p> <p>The emphasis in this unit is on calculations within a context. The contexts should be varied. Wherever possible, candidates should use real-life examples, such as information leaflets from banks and newspaper advertisements.</p> <p>Candidates will have to be able to recognise which operation to apply. Candidates should be given experience of calculations without a calculator.</p>

## National Cluster: details (cont)

### CLUSTER Mathematics (Access 3)

CONTENT	COMMENT	APPROACHES
<p>multiply and divide numbers in context, including money and measurement</p> <p>round to the nearest unit, or in the case of money, to the nearest pence</p> <p><b>Fractions and percentages</b> use simple common equivalence in context,</p> $10\% = \frac{1}{10} = 0.1 \qquad 20\% = \frac{1}{5} = 0.2$ $25\% = \frac{1}{4} = 0.25 \qquad 50\% = \frac{1}{2} = 0.5$ $75\% = \frac{3}{4} = 0.75$	<p>eg Emma purchases 15 litres of petrol at 63p per litre. How much is she charged? eg Supasave sell boxes of 48 Weetabix at £1.75, and boxes of 24 Weetabix at 95p. Which box gives the best value for money?</p> <p>eg A multi packet containing 6 bags of crisps costs 65p. Find the cost of each bag of crisps to the nearest pence.</p> <p>e.g Buying and selling, profit and loss, understand 50% discount as <math>\frac{1}{2}</math> price, and 25% discount as <math>\frac{1}{4}</math> off.</p>	<p>Able candidates should be extended towards the content of Mathematics 1 (Int 1), eg ‘calculations involving money in appropriate social contexts’ from Calculations in everyday contexts.</p> <p>Able candidates should be extended towards the content of Mathematics 1 (Int 1), eg ‘find a percentage of a quantity’</p>

## National Cluster: details (cont)

### CLUSTER Mathematics (Access 3)

CONTENT	COMMENT	APPROACHES
<p><b>Interpretation of information</b> use 12-hour and 24-hour times for simple problems involving time</p> <p>interpret and use information presented in a simple timetable</p> <p>interpret and use information presented in a table, where the table has up to three categories of data</p> <p><b>Measure</b> select appropriate measuring units for length, weight and volume (millimetre, centimetre, metre, kilometre, mile, gram, kilogram, millilitre, litre)</p>	<p>eg Catching a bus, train, plane, ferry. eg Morag arrives at the station at 0957 for a train leaving at 1015. How long does she wait? She took 14 minutes to walk to the station. What time did she leave home?</p> <p>eg Bus, train, plane, crossing times for a small island ferry.</p> <p>Examples of tables could include holiday brochures, postage tables, football league tables, car park tariffs including weekend or night rates, wage slips, bank or credit card statements.</p>	<p>Candidates should be introduced to both 12-hour and 24-hour times and their inter-relationship, although this need not be assessed.</p> <p>Wherever possible, examples should relate to candidates' own experience. For example, local timetables should be used, adapted if necessary.</p> <p>Although candidates will not be assessed on the selection of the appropriate measuring device, this should form a natural part of the teaching.</p>

## National Cluster: details (cont)

### CLUSTER Mathematics (Access 3)

CONTENT	COMMENT	APPROACHES
<p><b>Measure (cont)</b> order everyday objects according to weight or volume</p> <p>measure to a required degree of accuracy in millimetres, centimetres, metres, grams, kilograms, millilitres, litres</p>	<p>Estimate length, weight and volume in standard units by comparing with appropriate objects and containers by handling or experience.</p> <p>For volume, a graduated container should be used to measure to the nearest 10ml. For weight, kitchen scales, bathroom scales, etc should be used to measure to an appropriate degree of accuracy.</p>	<p>Candidates should have a working knowledge of appropriate measures of container volumes and weights of objects, eg volume: 1tsp., a cup, can of coke, pint/carton of milk, sink/fish tank, bath, pool; weight: crisps, small chocolate bar, butter, flour/potatoes, newborn baby, teenager, adult, car.</p> <p>Where possible, link into work in other areas of the curriculum, such as Design, Engineering and Technology, Home Economics, Food Technology, Geography, etc.</p> <p>Useful knowledge should include <math>1000\text{g} = 1\text{kg}</math> and <math>1000\text{ml} = 1\text{ litre}</math> and that <math>1\text{m } 63\text{cm} = 1.63\text{m} = 163\text{cm}</math> and that <math>2.534\text{m} = 2534\text{mm}</math> The emphasis should be on developing practical skills.</p> <p>It is important that candidates become familiar with the use of millimetres as they are a commonly used unit of measurement in industry. It is expected that candidates will estimate millimetres to the nearest ten or hundred.</p>

## National Cluster: details (cont)

**CLUSTER** Mathematics (Access 3)

CONTENT	COMMENT	APPROACHES
<p><b>Using Mathematics 3 (Acc 3)</b></p> <p><b>Numbers – Calculations in everyday contexts</b> add and subtract numbers in context, including money and measurement</p> <p>multiply and divide numbers in context, including money and measurement</p> <p>find simple fractions of quantities</p> <p>find simple percentages of quantities</p>	<p>Situations should be such that several operations may be required.</p> <p>eg A plank of wood is 3600mm long. A quarter of it is sawn off. What length is left?</p> <p>eg In a sale, a coat is marked at 10% off. The normal price is £54. What is the sale price?</p>	<p>The emphasis in this unit is on calculations within a context. The contexts should be varied. Wherever possible, candidates should use real-life examples, such as information leaflets from banks and newspaper advertisements.</p> <p>Candidates will have to be able to recognise which operations to apply and the order of operations. Candidates should be given experience of calculations without a calculator. Able candidates should be extended towards the content of Mathematics 1 (Int 1), eg ‘calculations involving money in appropriate contexts’ from Calculations in everyday contexts.</p>

## National Cluster: details (cont)

### CLUSTER Mathematics (Access 3)

CONTENT	COMMENT	APPROACHES
<p><b>interpretation and communication of information</b> interpret data from pictographs, bar graphs, scattergraphs and line graphs, with straightforward scales</p> <p>construct pictographs, bar graphs, scattergraphs and line graphs from given data, where the scale and structure are given</p> <p>give and/or follow instructions, such as directions for a simple route, journey or task</p>	<p>eg Temperature charts from holiday brochures, newspaper charts, sales forecasts, election polls, surveys.</p> <p>eg Andrew reads the cooking instructions for a 3kg turkey which state 30min per kg + 20min over. If he puts the turkey in at 2.10 p.m./1410, when should it be cooked?</p>	<p>Although for assessment purposes data would be given, it is expected that candidates would also have the experience of gathering and organising their own data.</p> <p>In assessments, candidates should only be required to complete a partly constructed graph.</p> <p>Where possible, link into other areas of the curriculum, such as Science, Social Subjects, Modern Studies, Geography etc.</p> <p>Candidates could be introduced to appropriate data-handling software packages. An appropriate data-handling package could be used for assessment purposes. Packages commonly used in the workplace have an added bonus. eg Excel, Clarisworks, Microsoft Works</p> <p>Where possible, link into Geography for simple local maps for journeys and routes.</p>

## National Cluster: details (cont)

**CLUSTER** Mathematics (Access 3)

CONTENT	COMMENT	APPROACHES
<p><b>Properties of shapes</b>            recognise, draw and complete symmetrical figures using simple line symmetry</p> <p>identify line symmetry in everyday items</p> <p>create or copy a tiling using a shape template</p> <p>find the area of figures by counting squares</p> <p>understand and use a formula in words, in the context of properties of shape</p> <p>recognise and name three-dimensional shapes from their two-dimensional representations: cube, pyramid, cylinder, cuboid, cone, sphere</p>	<p>eg Logos from newspaper advertisements.</p> <p>eg Bottles, furniture, cars, buildings, clothing.</p> <p>eg Carpet and floor tiles, bathroom wall tiles, paving, landscape gardening.</p> <p>eg Rectangle, square, right angled triangle, irregular figures.</p> <p>eg The area of a rectangle = number of tiles in 1 row <math>\times</math> number of rows.</p> <p>eg Everyday objects such as triangular prism packages, soup tins, golf balls, party hats, stock cubes, drink cans.</p>	<p>Tiling should be treated in practical contexts, such as carpet tiles. Area is dealt with formally within Mathematics 1 (Int 1).</p> <p>Links into Basic geometric properties in Mathematics 1 (Int 1) ie ‘find the area of simple composite shapes’.</p> <p>Links into Expressions and formulae in Mathematics 1 (Int 1) ie ‘evaluate formulae expressed in words’.</p>

## National Cluster: details (cont)

**CLUSTER** Mathematics (Access 3)

CONTENT	COMMENT	APPROACHES
<p><b>Properties of shapes (cont)</b></p> <p>find the volumes of solids such as cubes, cuboids and other solids by counting cubes</p>	<p>eg Cartons and boxes. How many soap powder cartons make up one layer in a box? How many layers can be fitted in the box? How many soap cartons will fill each box?</p> <p>eg The volume of a cuboid = the number of cubes in the first layer <math>\times</math> the number of layers.</p>	<p>Candidates should have the opportunity to deconstruct a variety of packages to see their nets and to construct cubes and cuboids from their nets, eg everyday objects such as cereal packet, milk carton, cylindrical and triangular prism packages. This could link to Applications of Mathematics (Int 1) Scale drawings and surface areas of solids.</p> <p>Links into Basic geometric shapes in Mathematics 1 (Int 1), ie ‘find volumes of cubes and cuboids’.</p> <p>Links into ‘Expressions and formulae’ in Mathematics 1 (Int 1) ie ‘evaluate formulae expressed in words’.</p>

**National Cluster: details (cont)**

**CLUSTER** Mathematics (Access 3)

CONTENT	COMMENT	APPROACHES
<p><b>Measurement</b> read straightforward scales on a variety of measuring devices</p> <p>interpret simple scales on maps, where the scale is expressed in words</p>	<p>eg Weight on kitchen and bathroom scales, temperature on thermometer, volumes in assorted measuring jugs, scales on protractor, ruler, tape measure, speedometer, read eight main compass points.</p>	<p>The emphasis here should be on developing practical skills.</p> <p>Where possible, link into work in other areas of the curriculum, such as Design, Engineering and Technology, Home Economics, Food Technology, Geography, etc.</p> <p>Where possible, use local maps.</p>

## **National Cluster: details (cont)**

### **CLUSTER            Mathematics (Access 3)**

#### **ASSESSMENT**

Candidates should be aware of assessment criteria and instruments. It is anticipated that ongoing assessment will take place, informing and supporting candidates. Wherever possible, assessment instruments should be designed to reflect the learning and teaching activities and the contextual nature of the units. Assessment instruments should recognise what the candidate can do, thereby providing a positive experience.

The units which comprise the cluster will be assessed internally. Details of the internal assessment are provided in the unit specification. The arrangements for assessment should be flexible in order to cater for a wide range of needs, for example, the assessment may have to be read to the candidates. Wherever possible, the assessment instrument should be designed to cover more than one outcome (which may be from more than one component unit).

#### **APPROACHES TO LEARNING AND TEACHING**

The learning and teaching process should foster positive attitudes to the subject. While exposition to a class or group is important, it is equally important that candidates are involved in discussion and activity. Use of practical material and technology is encouraged. Candidates should maintain their skills in written and mental calculation; the use of the calculator should complement and not replace these skills. Candidates should use calculators sensibly and appreciate the need to estimate answers and check calculations. Strategies for estimating should therefore be emphasised.

One of the aims of mathematics is to prepare candidates for the future demands of adult life, employment, further study and training. Such an aim implies that all candidates should be encouraged to tackle problems as they appear in the real world. Such problems are not always well defined and may require information to be sought and decisions to be made. Work of this kind will allow candidates to see the relevance of what they are learning.

There are ample opportunities within each of the units to relate the skills to other areas of the curriculum, such as measurement of length and use of scale within Design, Engineering and Technology, or weighing and measurement within Food Technology. These opportunities should be exploited wherever possible.

As candidates progress through the cluster there should be an increased emphasis on problem solving.

## **National Cluster: details (cont)**

**CLUSTER**            Mathematics (Access 3)

### **SPECIAL NEEDS**

This specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment and Certification Arrangements for Candidates with Special Needs/Candidates whose First Language is not English* (SQA, 1998).

### **SUBJECT GUIDES**

A Subject Guide to accompany the Arrangements documents has been produced by the Higher Still Development Unit (HSDU) in partnership with the Scottish Consultative Council on the Curriculum (SCCC) and Scottish Further Education Unit (SFEU). The Guide provides further advice and information about:

- support materials for each cluster
- learning and teaching approaches in addition to the information provided in the Arrangements document
- assessment
- ensuring appropriate access for candidates with special educational needs

The Subject Guide is intended to support the information contained in the Arrangements document. The SQA Arrangements documents contain the standards against which candidates are assessed.

## National Unit Specification: general information

<b>UNIT</b>	Using Mathematics 1 (Access 3)
<b>NUMBER</b>	D559 09
<b>CLUSTER</b>	Mathematics (Access 3)

### SUMMARY

This unit is designed for candidates who require reinforcement of basic number skills, practice in money calculations, and simple interpretation of data and measurement. It is a component of the cluster Mathematics (Acc 3).

### OUTCOMES

1. Use the four operations with whole numbers.
2. Use money in a range of contexts.
3. Interpret and use information.
4. Measure appropriately.

### RECOMMENDED ENTRY

Entry is at the discretion of the centre.

### CREDIT VALUE

1 credit at Access 3.

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### Administrative Information

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## **National Unit Specification: general information (cont)**

**UNIT**                      Using Mathematics 1 (Access 3)

### **CORE SKILLS**

This unit gives automatic certification of the following:

<b>Complete core skills for the unit</b>	None	
<b>Core skills components for the unit</b>	Using Number	Acc 2

Additional information about core skills is published in *Automatic Certification of Core Skills in National Qualifications* (SQA, 1999).

## **National Unit Specification: statement of standards**

### **UNIT**                      Using Mathematics 1 (Access 3)

Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to the Scottish Qualifications Authority.

#### **OUTCOME 1**

Use the four operations with whole numbers.

##### **Performance criteria**

- (a) Add whole numbers in context.
- (b) Subtract whole numbers in context.
- (c) Multiply whole numbers in context.
- (d) Divide whole numbers in context.
- (e) Use simple fractions in context.
- (f) Express numbers given in figures in words, and vice versa.

#### **OUTCOME 2**

Use money in a range of contexts.

##### **Performance criteria**

- (a) Add and subtract money in context using appropriate checking procedures.
- (b) Multiply and divide money in context using appropriate checking procedures.

#### **OUTCOME 3**

Interpret and use information.

##### **Performance criteria**

- (a) Interpret and use information presented in a table with up to two categories of data.
- (b) Communicate information in a simple table with up to two categories of data.
- (c) Interpret and use information presented in a pictograph.

## **National Unit Specification: statement of standards (cont)**

**UNIT**                      Using Mathematics 1 (Access 3)

### **OUTCOME 4**

Measure appropriately.

#### **Performance criteria**

- (a) Select the appropriate unit of measurement for length.
- (b) Measure to a required degree of accuracy.

#### **Evidence requirements**

Although there are various ways of demonstrating achievement of the outcomes, evidence would normally be presented in the form of a closed-book test under controlled conditions. Examples of such tests are contained in the National Assessment Bank.

## **National Unit Specification: support notes**

### **UNIT                      Using Mathematics 1 (Access 3)**

This part of the unit specification is offered as guidance. The support notes are not mandatory.

While the time allocated to this unit is at the discretion of the centre, the notional design length is 40 hours.

#### **GUIDANCE ON CONTENT AND CONTEXT FOR THIS UNIT**

The overall aim of mathematics provision at Access 3 level is to build confidence in the use of mathematical processes by demonstrating their relevance to everyday situations. Placing mathematical knowledge and skills in contexts which candidates can relate to should stimulate interest and encourage candidates to extend their mathematical experience.

Each of the three units has outcomes in basic number, information handling and measurement. Money outcomes span the first two units. Properties of shape in Unit 3, is the only outcome which does not span at least two units. The close connecting structure of the units at this level provides incremental progress in these basic themes for candidates taking the cluster.

In this first unit, Outcome 1 focuses on addition, subtraction, multiplication and division of whole numbers in context and Outcome 2 addresses the same operations in the context of money. In Outcome 3, candidates are required to demonstrate competence in interpretation of information in tables and pictographs, and in Outcome 4, practical measuring skills are applied to length.

The emphasis throughout the unit is on calculations within a context. Wherever possible, the contexts should be varied and linked to candidates' personal experiences.

The detailed content section contains the recommended content for this unit and provides illustrative examples to indicate the depth of treatment required to achieve a unit pass and advice on teaching approaches.

#### **GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT**

Candidates should be encouraged throughout the unit to make use of their skills in mental calculation, to make efficient use of calculators and to apply the strategy of checking. Numerical checking or checking a result against the context in which it is set is an integral part of every mathematical process. In many instances, the checking can be done mentally, but on occasions, to stress its importance, there should be evidence of a checking procedure within the calculation. There are various checking procedures which could be used:

- relating to a context – ‘How sensible is my answer?’
- estimate followed by a repeated calculation
- calculation in a different order

In the statement of particular performance criteria within units there is a reference to appropriate checking. Checking should be integral to any mathematical process so candidates should be prepared to provide evidence of a checking procedure having been used.

## **National Unit Specification: support notes (cont)**

### **UNIT**                      Using Mathematics 1 (Access 3)

Further advice on learning and teaching approaches is contained within the Subject Guide for Mathematics.

#### **GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT**

The assessment of this unit will normally be in the form of a closed-book test. Such tests should be carried out under supervision. At this level the approach to assessment should be flexible, based on the needs of individual candidates. Successful achievement of the unit is demonstrated by candidates achieving the thresholds of attainment specified for all the outcomes in the unit. Candidates who fail to achieve the threshold(s) of attainment need only be retested on those outcome(s) where the outcome threshold has not been attained. Further advice on assessment and retesting is contained within the National Assessment Bank.

#### **SPECIAL NEEDS**

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment and Certification Arrangements for Candidates with Special Needs/Candidates whose First Language is not English* (SQA, 1998).

## National Unit Specification: general information

<b>UNIT</b>	Using Mathematics 2 (Access 3)
<b>NUMBER</b>	D560 09
<b>CLUSTER</b>	Mathematics (Access 3)

### SUMMARY

This unit seeks to provide reinforcement of number skills, measuring skills in various contexts, practice in money calculations and interpretation of information including that relating to time. It is a component unit of the cluster Mathematics (Acc 3).

### OUTCOMES

1. Perform calculations in everyday contexts.
2. Use fractions and percentages in context.
3. Interpret and use information.
4. Measure appropriately.

### RECOMMENDED ENTRY

Entry is at the discretion of the centre.

### CREDIT VALUE

1 credit at Access 3.

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### Administrative Information

<b>Superclass:</b>	RB
<b>Publication date:</b>	November 1999
<b>Source:</b>	Scottish Qualifications Authority
<b>Version:</b>	02

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## National Unit Specification: general information (cont)

**UNIT**                      Using Mathematics 2 (Access 3)

### CORE SKILLS

This unit gives automatic certification of the following:

<b>Complete core skills for the unit</b>	None	
<b>Core skills components for the unit</b>	Using Number	Acc 3

Additional information about core skills is published in *Automatic Certification of Core Skills in National Qualifications* (SQA, 1999).

## **National Unit Specification: statement of standards**

### **UNIT**                      Using Mathematics 2 (Access 3)

Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to the Scottish Qualifications Authority.

#### **OUTCOME 1**

Perform calculations in everyday contexts.

##### **Performance criteria**

- (a) Select and use the appropriate operation(s) using appropriate checking procedures.
- (b) Round to the nearest unit in context.

#### **OUTCOME 2**

Use fractions and percentages in context.

##### **Performance criterion**

Use common vulgar and decimal fraction and percentage equivalences in context.

#### **OUTCOME 3**

Interpret and use information.

##### **Performance criteria**

- (a) Use 12-hour and 24-hour times for simple problems involving time.
- (b) Interpret and use information presented in a timetable.
- (c) Interpret and use information presented in a table with up to three categories of data.

#### **OUTCOME 4**

Measure appropriately.

##### **Performance criteria**

- (a) Select the appropriate unit of measurement for length, weight or volume.
- (b) Order everyday objects according to weight or volume.
- (c) Measure to a required degree of accuracy.

##### **Evidence requirements**

Although there are various ways of demonstrating achievement of the outcomes, evidence would normally be presented in the form of a closed-book test under controlled conditions. Examples of such tests are contained in the National Assessment Bank.

## **National Unit Specification: support notes**

### **UNIT                      Using Mathematics 2 (Access 3)**

This part of the unit specification is offered as guidance. The support notes are not mandatory.

While the time allocated to this unit is at the discretion of the centre, the notional design length is 40 hours.

#### **GUIDANCE ON CONTENT AND CONTEXT FOR THIS UNIT**

The overall aim of mathematics provision at Access 3 level is to build confidence in the use of mathematical processes by demonstrating their relevance to everyday situations. Placing mathematical knowledge and skills in contexts which candidates can relate to should stimulate interest and encourage candidates to extend their mathematical experience.

Each of the three units has outcomes in basic number, information handling and measurement. Money outcomes span the first two units. Properties of shape in Unit 3, is the only outcome which does not span at least two units. The close connecting structure of the units at this level provides incremental progress in these basic themes for candidates taking the cluster.

In this unit, the second of the three, the number and money outcomes of Unit 1 are extended to problems where selection of the appropriate operations is less obvious, again with the emphasis firmly placed on realistic and meaningful applications. In Outcome 3, interpretation of the simple tables of information introduced in Unit 1 is extended to interpretation of more comprehensive tables of data and timetables for travel and other activities. Outcome 4 extends measuring activities including estimation, beyond length and into weight and volume.

The emphasis throughout the unit is on calculations within a context. Wherever possible, the contexts should be varied and linked to candidates' personal experiences.

The detailed content section contains the recommended content for this unit and provides illustrative examples to indicate the depth of treatment required to achieve a unit pass and advice on teaching approaches.

#### **GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT**

Candidates should be encouraged throughout the unit to make use of their skills in mental calculation, to make efficient use of calculators and to apply the strategy of checking. Numerical checking or checking a result against the context in which it is set is an integral part of every mathematical process. In many instances, the checking can be done mentally, but on occasions, to stress its importance, there should be evidence of a checking procedure within the calculation.

There are various checking procedures which could be used:

- relating to a context – ‘How sensible is my answer?’
- estimate followed by a repeated calculation
- calculation in a different order

In the statement of particular performance criteria within units there is a reference to appropriate checking. Checking is integral to any mathematical process, so candidates should be prepared to provide evidence of a checking procedure having been used.

## **National Unit Specification: support notes (cont)**

### **UNIT**                      Using Mathematics 2 (Access 3)

Further advice on learning and teaching approaches is contained within the Subject Guide for Mathematics.

#### **GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT**

The assessment of this unit will normally be in the form of a closed-book test. Such tests should be carried out under supervision. At this level the approach to assessment should be flexible, based on the needs of individual candidates. Successful achievement of the unit is demonstrated by candidates achieving the thresholds of attainment specified for all the outcomes in the unit. Candidates who fail to achieve the threshold(s) of attainment need only be retested on those outcome(s) where the outcome threshold has not been attained. Further advice on assessment and retesting is contained within the National Assessment Bank.

#### **SPECIAL NEEDS**

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment and Certification Arrangements for Candidates with Special Needs/Candidates whose First Language is not English* (SQA, 1998).

## National Unit Specification: general information

**UNIT** Using Mathematics 3 (Acc 3)

**NUMBER** D561 09

**CLUSTER** Mathematics (Access 3)

### SUMMARY

This unit seeks to provide reinforcement in a range of basic mathematical skills, including number, information handling, measurement and shape. It is a component unit of the cluster Mathematics (Acc 3).

### OUTCOMES

1. Perform calculations in everyday contexts.
2. Interpret and communicate information.
3. Use properties of shapes.
4. Use further measurement skills.

### RECOMMENDED ENTRY

Entry is at the discretion of the centre.

### CREDIT VALUE

1 credit at Access 3.

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### Administrative Information

**Superclass:** RB

**Publication date:** November 1999

**Source:** Scottish Qualifications Authority

**Version:** 02

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## National Unit Specification: general information (cont)

**UNIT** Using Mathematics 3 (Acc 3)

### CORE SKILLS

This unit gives automatic certification of the following:

<b>Complete core skills for the unit</b>	Numeracy	Acc 3
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<b>Core skills components for the unit</b>	None
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Additional information about core skills is published in *Automatic Certification of Core Skills in National Qualifications* (SQA, 1999).

## **National Unit Specification: statement of standards**

### **UNIT**                      Using Mathematics 3 (Acc 3)

Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to the Scottish Qualifications Authority.

#### **OUTCOME 1**

Perform calculations in everyday contexts.

##### **Performance criteria**

- (a) Select and use appropriate operation(s) in context using appropriate checking procedures.
- (b) Find simple percentages and fractions of quantities.

#### **OUTCOME 2**

Interpret and communicate information.

##### **Performance criteria**

- (a) Interpret and use information from a bar graph, scattergraph, line graph or pictograph.
- (b) Construct a bar graph, scattergraph, line graph or pictograph from given data where the scale and structure are given.
- (c) Give and/or follow instructions, such as directions for a route, journey or task.

#### **OUTCOME 3**

Use properties of shapes.

##### **Performance criteria**

- (a) Complete drawings using simple line symmetry.
- (b) Create a tiling using a shape template.
- (c) Find the area of figures by counting squares.
- (d) Use a formula in words in the context of properties of shape.
- (e) Recognise and name three-dimensional shapes from their two-dimensional representations.
- (f) Find the volume of solids by counting cubes.

## **National Unit Specification: statement of standards (cont)**

### **UNIT**                      Using Mathematics 3 (Acc 3)

#### **OUTCOME 4**

Use further measurement skills.

#### **Performance criteria**

- (a) Read straightforward scales from a variety of measuring devices.
- (b) Interpret simple scales on maps where the scale is expressed in words.

#### **Evidence requirements**

Although there are various ways of demonstrating achievement of the outcomes, evidence would normally be presented in the form of a closed book test under controlled conditions. Examples of such tests are contained in the National Assessment Bank.

## **National Unit Specification: support notes**

### **UNIT                      Using Mathematics 3 (Acc 3)**

This part of the unit specification is offered as guidance. The support notes are not mandatory.

While the time allocated to this unit is at the discretion of the centre, the notional design length is 40 hours.

#### **GUIDANCE ON CONTENT AND CONTEXT FOR THIS UNIT**

The overall aim of mathematics provision at Access 3 level is to build confidence in the use of mathematical processes by demonstrating their relevance to everyday situations. Placing mathematical knowledge and skills in contexts which candidates can relate to should stimulate interest and encourage candidates to extend their mathematical experience.

Each of the three units has outcomes in basic number, information handling and measurement. Money outcomes span the first two units. Properties of shape in Unit 3, is the only outcome which does not span at least two units. The close connecting structure of the units at this level provides incremental progress in these basic themes for candidates taking the cluster.

In this third unit, Outcome 1 requires candidates to demonstrate competence in applications of the four basic number operations, and in using simple percentages and fractions. Interpretation and handling of information is assessed in Outcome 2 in a wide range of statistical graphs and diagrams. The topic of shape makes its introduction to Access 3 in Outcome 3, in a variety of forms including symmetry, tiling and areas and volumes. Measurement activities of Units 1 and 2 are extended in Outcome 4 to scales on instruments and maps.

The emphasis throughout the unit is on calculations within a context. Wherever possible, the contexts should be varied and linked to candidates' personal experience.

The detailed content section contains the recommended content for this unit and provides illustrative examples to indicate the depth of treatment required to achieve a unit pass and advice on teaching approaches.

#### **GUIDANCE ON TEACHING AND LEARNING APPROACHES FOR THIS UNIT**

Candidates should be encouraged throughout the unit to make use of their skills in mental calculations, to make efficient use of calculators and to apply the strategy of checking. Numerical checking or checking a result against the context in which it is set is an integral part of every mathematical process. In many instances, the checking can be done mentally, but on occasions, to stress its importance, there should be evidence of a checking procedure within the calculation. There are various checking procedures which could be used:

- relating to a context – ‘How sensible is my answer?’
- estimate followed by a repeated calculation
- calculation in a different order

In the statement of particular performance criteria within units, there is a reference to appropriate checking. Checking should be integral to any mathematical process so candidates should be prepared to provide evidence of a checking procedure having been used.

## **National Unit Specification: support notes (cont)**

### **UNIT**                      Using Mathematics 3 (Acc 3)

Further advice on learning and teaching approaches is contained within the Subject Guide for Mathematics.

#### **GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT**

The assessment of this unit will normally be in the form of a closed-book test. Such tests should be carried out under supervision. At this level the approach to assessment should be flexible, based on the needs of individual candidates. Successful achievement of the unit is demonstrated by candidates achieving the thresholds of attainment specified for all the outcomes in the unit. Candidates who fail to achieve the threshold(s) of attainment need only be retested on those outcome(s) where the outcome threshold has not been attained. Further advice on assessment and retesting is contained within the National Assessment Bank.

#### **SPECIAL NEEDS**

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment and Certification Arrangements for Candidates with Special Needs/Candidates whose First Language is not English* (SQA, 1998).