



## National Unit Specification: General Information

**UNIT** Numeracy (Intermediate 2)

**NUMBER** D01C 11

### COURSE

### SUMMARY

This unit seeks to develop skills of interpretation and communication of graphical information and application of a wide range of numerical skills in everyday and straightforward generalised contexts.

### OUTCOMES

- 1 Interpret graphical information when presented as a number of related but straightforward forms or in a complex form.
- 2 Select and use appropriate forms of table, graph, chart or diagram to communicate information.
- 3 Apply a wide range of numerical skills.

### RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates would normally be expected to have attained Numeracy (Intermediate 1).

### CREDIT VALUE

1 Credit at Intermediate 2.

### CORE SKILLS

Information on the automatic certification of core skills is published in *Automatic Certification of Core Skills in National Qualifications* (SQA, 1999).

The attainment of this unit will lead to the automatic award of:

- Numeracy at Intermediate 2

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### Administrative Information

**Superclass:** RB

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## National unit specification: statement of standards

**UNIT** Numeracy (Intermediate 2)

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

Interpret graphical information when presented as a number of related but straightforward forms or in a complex form.

#### Performance Criteria

- a) Extract information from tables, graphs, charts, or diagrams when presented as a number of related but straightforward forms or in a complex form.
- b) Explain extracted information appropriately in terms of the context.

#### Note on range for the outcome

Graphical information: information may involve concepts/relationships such as cumulative frequency, speed/velocity, complex variables (drops per minute).

Complex form: eg. a qualitative graph; a graph where part of the axis has been omitted in order to disguise the situation; histograms; stem-and-leaf charts.

Diagrams: eg. circuit diagrams; flow charts; project plan/timeline diagrams; ordnance survey maps.

#### Evidence Requirements

Oral, written and/or performance evidence that the candidate can correctly extract and explain graphical information from three of tables, graphs, charts and diagrams. At least one extraction should involve interpolation and extrapolation.

### OUTCOME 2

Select and use appropriate forms of table, graph, chart or diagram to communicate information.

#### Performance Criteria

- a) Select an appropriate form.
- b) Use the selected form of communication to present information clearly.

#### Note on range for the outcome

Communicate information: information communicated in the form of tables; line graphs; bar charts; pie charts; stem and leaf charts; histograms or diagrams as appropriate to the context.

#### Evidence Requirements

Evidence that the candidate can select appropriate forms of communication and present information clearly. At least three different forms of communication should be used.

## National unit specification: statement of standards (cont)

**UNIT** Numeracy (Intermediate 2)

### **OUTCOME 3**

Apply a wide range of numerical skills.

#### **Performance Criteria**

- a) Work with a numerical concept.
- b) Decide the operations to be carried out.
- c) Carry out complex calculations.
- d) Carry out sustained calculations.

#### **Note on range for the outcome**

Numerical concept: eg. the concept of negative numbers (in the context of a number line or as temperatures below zero); or the concept of different types of data (eg. qualitative, quantitative, discrete, continuous); or numbers represented by symbols (eg.  $x$  or  $y$ ); or statistical concepts eg. range).

Complex calculations: eg. use of formulae in symbolic form; calculations involving indices (scientific notation); calculation of standard deviation; manipulation of symbols; addition, subtraction, multiplication and division of fractions.

#### **Evidence Requirements**

Oral, written and/or performance evidence that the candidate can:

- solve problems involving one numerical concept in an everyday, straightforward generalised context
- carry out one complex calculation in an everyday straightforward generalised context
- carry out three different calculations involving sustained calculations in everyday straightforward generalised contexts and involving basic operations on whole numbers, decimals, percentages, fractions or ratios.

At least two of the calculations should involve four or five operations.

## **National unit specification: support notes**

### **UNIT** Numeracy (Intermediate 2)

This part of the unit specification is offered as guidance. None of the sections of the support notes is mandatory.

#### **GUIDANCE ON CONTENT AND CONTEXT**

The content and context for this core skills unit should be appropriate to the personal and/or vocational needs of the candidate.

Core skills units are stated at five levels of attainment, with activities becoming progressively more demanding in breadth and depth, and in the extent of individual autonomy required. The appendix to this unit shows the relationship between the levels in Numeracy.

This unit is designed to develop numeracy skills at a level which is the minimum required for intermediate posts in business, administration, care and technician occupations.

#### **Outcome 1**

At this level, information may involve complex concepts/relationships which the candidate may have encountered through personal experience, in an area of study or in the work setting. It may also involve situations where the candidate deals with a problem in a more generalised way eg. statistical correlation of experimental data. The candidate should be familiar with complex forms of information where scales of graph have been compressed or stretched to create a desired impression or where part of an axis has been omitted eg. business trends. Graphical information, where appropriate, will require interpolation between existing points and extrapolation outside the range of values in the original data.

#### **Outcome 2**

At this level and above, the candidate should be familiar with tables, line graphs, bar charts, stem and leaf charts, histograms and diagrams commonly used in the area of study. However, evidence of use of all forms is not required. The candidate should select the form which best communicates the information. They must use at least 3 different forms.

Candidates should be familiar with the use of advanced calculators and computer spreadsheets that can manipulate and present data in a variety of graphical formats.

## **National unit specification: support notes (cont)**

**UNIT** Numeracy (Intermediate 2)

### **Outcome 3**

At this level and above, the candidate should be able to:

- add and subtract
- multiply and divide
- use whole numbers and decimals
- work with percentages, fractions and ratios.

However, evidence of each of these is not required.

The numerical concept to be worked with will depend on the area of study. It could be positive and negative numbers. For example, in business the concepts of positive and negative numbers could arise in profit and loss returns; in science, temperature differences may be positive or negative. Complex calculations may use formulae and symbols in scientific contexts such as the gas laws or Newton's Laws. One possible approach would be to integrate part of outcome 3 and outcome 2 and analyse data calculating statistical terms, such as range and standard deviation, as appropriate. At this level, the candidate should be able to work with indices such as squares and square roots and work with numbers expressed in scientific notation. Solutions to real problems should be carefully considered – rejecting answers which are mathematically correct but invalid in context. Calculations should be checked against estimates or by using the inverse algorithm. Evidence of checking procedures is not required. Answers should be expressed to an appropriate level of accuracy particularly when interpreting calculator displays.

### **The use of calculators**

The sensible use of appropriate technologies (numeric/scientific/graphic or programmable calculators or computers) should be encouraged. Due account should be taken of estimating and rounding errors introduced into calculations. Tables, graphs, charts and diagrams may be drawn using IT tools provided the candidate understands the underlying concepts.

### **GUIDANCE ON TEACHING AND LEARNING APPROACHES**

The learning and teaching approaches should encourage candidates to identify evidence of their attainment and to transfer the skills acquired to other contexts.

Where appropriate, numeracy topics should be taught and skills developed in real-life contexts. Candidates should be encouraged throughout the unit to make use of skills in mental and written calculations, to make efficient use of calculators and to apply the strategy of checking. The outcomes should be demonstrated in situations which the candidate may reasonably be expected to encounter everyday and in unfamiliar contexts where the relevant facts and their importance need to be identified and clarified.

## National unit specification: support notes (cont)

### UNIT Numeracy (Intermediate 2)

Where the Numeracy unit is being combined with another unit to create an enhanced learning and teaching programme, care must be taken to ensure that all aspects of each unit are covered and adequate time must be allowed for the coverage of both units. Such a programme would create opportunities to consolidate the skills gained in this unit.

### GUIDANCE ON APPROACHES TO ASSESSMENT

The statement of satisfactory performance for each outcome indicates the minimum required for the purpose of summative assessment. However, the number of activities undertaken by the candidate in the course of the unit should not be limited to those specified for assessment purposes. In awarding the candidate Numeracy at Intermediate 2 the teacher/lecturer must be confident that the candidate will be able to demonstrate these skills in any appropriate context and set of circumstances.

Teachers/lecturers must remember to distinguish between their differing roles in formative and summative assessment. In the former, as much help and support as is required by the candidate may legitimately be given by the teachers/lecturers. Tasks which are used to provide evidence for summative assessment must be completed by the candidate unaided.

Evidence of attainment should be gathered, wherever possible, from integrated activities whether this unit is being studied as a stand alone unit or in combination with other units in the candidate's programme. Where an integrated approach to assessment is adopted, teachers/lecturers should provide a matrix of evidence which shows clearly where each PC is covered. This will be necessary for internal and external verification.

### 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* (SQA, 1998).

**Numeracy core skills units  
Progression chart**

**Appendix**

<b>Skill</b>	<b>Access 2</b>	<b>Access 3</b>	<b>Intermediate 1</b>	<b>Intermediate 2</b>	<b>Higher</b>
<b>Use graphical information</b>	<p>Read and use a basic scale.</p> <p>Identify basic graphical information.</p> <p>Communicate basic graphical information with teacher/lecturer support.</p>	<p>Read and use a simple scale.</p> <p>Extract simple graphical information.</p> <p>Communicate simple graphical information.</p>	<p>Read and use a straightforward scale.</p> <p>Interpret straightforward graphical information.</p> <p>Communicate straightforward graphical information.</p>	<p>Interpret graphical information when presented as a number of related but straightforward forms or in a complex form.</p> <p>Select and use appropriate forms of table, graph, chart or diagram to communicate information.</p>	<p>Analyse and interpret graphical information.</p> <p>Select and use appropriate graphical forms to communicate information.</p>
<b>Apply numerical skills</b>	<p>Apply a range of basic numerical skills in familiar everyday contexts.</p>	<p>Apply a range of basic numerical skills in everyday contexts.</p>	<p>Apply a range of basic numerical skills in everyday contexts.</p>	<p>Apply a wide range of numerical skills.</p>	<p>Apply in combination a wide range of numerical and statistical skills.</p>