



Numeracy (National 4)

Draft Unit Support Notes

For general advice and guidance on the Unit.



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Please refer to the note of changes at the end of this document for details of changes from previous version (where applicable).

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Introduction

These support notes are not mandatory. They provide advice and guidance on approaches to delivering and assessing the *Numeracy (National 4) Unit*. They are intended for teachers and lecturers who are delivering this Unit. They should be read in conjunction with the:

- ◆ *Numeracy (National 4) Unit Specification*
- ◆ *Mathematics (National 4) Course Specification*
- ◆ *Mathematics (National 4) Added Value Unit Specification*
- ◆ *Mathematics (National 4) Course Support Notes*
- ◆ *Lifeskills Mathematics (National 4) Course Specification*
- ◆ *Lifeskills Mathematics (National 4) Added Value Unit Specification*
- ◆ *Lifeskills Mathematics (National 4) Course Support Notes*

If the *Unit Support Notes* have been developed for a Unit which is not part of a Course, then it is only necessary to read them in conjunction with the *Unit Specification*.

General guidance on the Unit

Aims

The *Numeracy* (National 4) Unit is a mandatory Unit in the Mathematics (National 4) Course and the Lifeskills Mathematics (National 4) Course. The *Numeracy* Unit is also available as a free-standing Unit and is designed to meet the needs of a broad range of learners who may choose to study it.

All teachers/lecturers have responsibility for promoting the development of numeracy across learning. Numeracy skills are expected to be developed within all National Courses and how this is managed will vary from Course to Course. All centres should have strategies in place to ensure that teachers/lecturers have a shared understanding of the standards expected, of how learners progress in numeracy and of sound approaches to teaching and learning.

The general aim of the *Numeracy* Unit at National 4 is to develop learners' numerical and information handling skills to solve given, real-life problems involving number, money, time and measurement.

At this level, real-life problems will be straightforward and set in familiar contexts relevant to the learner. As learners tackle and solve real-life problems, they will decide which numeracy and information handling skills to use and how to apply those skills with an appropriate level of accuracy. Learners will then use their solutions to make and explain their decisions.

Learners who successfully complete this Unit will have achieved the following Outcomes:

- 1 Use numerical skills to solve given, straightforward real-life problems involving money/time/measurement.
- 2 Interpret graphical data, and situations involving probability to solve given, straightforward real-life problems involving money/time/measurement.

Progression into this Unit

Entry into this Unit is at the discretion of the Centre. However, learners would normally be expected to have attained the skills, knowledge and understanding required by one or more of the following or equivalent qualifications and/or experience:

- ◆ Numeracy (SCQF level 3) Unit
- ◆ Access 3 Lifeskills Mathematics Course or its component Units
- ◆ SCQF level 3 Core Skills Numeracy

Prior learning, life and work experiences may also provide an appropriate basis for entry into this Unit. This could include relevant skills, knowledge and understanding and appropriate experiences and outcomes from the mathematics curriculum area and from numeracy across learning. Examples of experiences and outcomes that are particularly relevant are given in the *Course Support Notes*.

Centres wishing to establish the suitability of learners without prior qualifications and/or experiences and outcomes may benefit from carrying out a diagnostic review of prior life and work experiences. This approach may be particularly useful for adults returning to education.

Skills, knowledge and understanding covered in the Unit

Information about skills, knowledge and understanding is given in the Lifeskills Mathematics (National 4) *Course Support Notes* and the Mathematics (National 4) *Course Support Notes*.

If this Unit is being delivered on a free-standing basis, teachers and lecturers are free to select the skills, knowledge, understanding and contexts which are most appropriate for delivery in their centres.

Progression from this Unit

This Unit may provide progression to:

- ◆ Numeracy (SCQF level 5) Unit
- ◆ Core Skills Numeracy (SCQF level 5)
- ◆ other Units within Lifeskills Mathematics Course at National 4
- ◆ other Units within Mathematics Course at National 4
- ◆ National Certificate Group Awards
- ◆ further study, employment and/or training

Numeracy has applications in a variety of other subject areas including life and work. The skills, knowledge and understanding developed in this Unit could support both breadth and depth of learning in other curriculum areas in addition to life and work contexts.

Hierarchies

Hierarchy is the term used to describe Courses and Units which form a structured sequence involving two or more SCQF levels.

It is important that any content in a Course and/or Unit at one particular SCQF level is not repeated if a learner progresses to the next level of the hierarchy. The skills and knowledge should be able to be applied to new content and contexts to enrich the learning experience. This is for centres to manage.

The *Literacy* (National 4) Unit has been developed using the SCQF level descriptors to form a hierarchy with the *Literacy* (Access 3) Unit and the *Literacy* (National 5) Unit.

The Literacy Units at Access 3, National 4 and National 5 follow a similar structure in terms of Outcomes and Assessment Standards but differ in the degree of difficulty and complexity from one level to the next. This structure aims to facilitate bi-level teaching and enables learners to gain recognition for their

successful learner, confident individual, responsible citizen, effective contributor

best achievement. Learners may achieve, and be certificated for, a Unit at the level above or below.

Evidence should satisfy the Assessment Standards at the appropriate level.

Further information on how this hierarchy can be managed is given in the section titled 'Approaches to learning and teaching'.

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Approaches to learning, teaching and assessment

The Lifeskills Mathematics (National 4) *Course Support Notes* and the Mathematics (National 4) *Course Support Notes* provide advice and guidance on approaches to learning and teaching which apply to all component Units of the Course.

When delivering this Unit as part of the Lifeskills Mathematics (National 4) Course or the Mathematics (National 4) Course, reference should be made to the appropriate content statements within the 'Further mandatory information on Course coverage' section in the relevant *Added Value Unit Specifications*.

The Numeracy Unit can also be taken as a free-standing Unit. If this Unit is being delivered on a free-standing basis, teachers and lecturers are free to select the approaches to teaching and learning and contexts which are most appropriate for delivery in their centres.

Combining learning, teaching and assessment within the Unit

The combination of delivery and assessment of this Unit is entirely at the discretion of the centre. Two main approaches are suggested here, but other possibilities exist:

Possible combinations	Suggested approaches
Outcomes 1 and 2 combined	In this approach, Outcomes 1 and 2 could be combined. Learners could be given the opportunity to use numerical skills to interpret graphical data and situations involving probability. This could involve learners selecting and using numerical notation, units, and calculations to manipulate and interpret data. Learners could also use the results of calculations to make and explain decisions based on the interpretation of data. Assessment evidence could be collected at the end of the Unit.
Outcomes 1 and 2 sequentially	In this approach, the two Outcomes could be delivered sequentially and in any order. Assessment evidence could be collected at the end of the Unit or during the delivery of each Outcome.

Further details about possible approaches to learning, teaching and assessment are given in the *Course Support Notes*.

Examples of possible contexts for the learning and teaching of Numeracy can be found in Appendix 2.

Exemplification of assessment can be found in the *National Assessment Resource*.

Further information about resources for learning, teaching and assessment can be found in the *Course Support Notes*.

Developing skills for learning, skills for life and skills for work

For this Unit there are significant opportunities to develop the following skills for learning, skills for life and skills for work; some of these opportunities are described in the table below:

SQA skills for learning, skills for life and skills for work framework definition	Suggested approaches for learning and teaching
Applying is the ability to use existing information to solve a problem in a different context, and to plan, organise and complete a task.	Wherever possible, learners could be given the opportunity to apply the skills, knowledge and understanding they have developed to solve mathematical problems in a range of real-life contexts. Learners could be encouraged to think about how they are going to tackle problems, decide which skills to use and then carry out the calculations in order to complete the task. To determine a learner's level of understanding, learners could be encouraged to show and explain their thinking.
Analysing and evaluating is the ability to identify and weigh up the features of a situation or issue and to use your judgement of them in coming to a conclusion. It includes reviewing and considering any potential solutions.	Wherever possible, learners could be given the opportunity to interpret the results of their calculations and to draw conclusions. Conclusions drawn by the learner should be used to form the basis of any reasoning demonstrated by making choices or decisions to solve a given problem.

There may also be further opportunities for the development of additional skills for learning, skills for life and skills for work in the delivery of this Unit. These opportunities may vary and are at the discretion of the centre.

E-assessment

E-assessment can play an important role in the design and delivery of National Courses and Units by supporting integration and learners' personalisation and choice. While it is important not to introduce new, additional ICT skills or knowledge, it may be that learners may be using ICT in working towards their assessment.

Where resources permit, centres could use technology to support learning, teaching and assessment. Further advice and guidance on e-assessment can be found in the *Course Support Notes*.

Equality and inclusion

This Unit may present a number of barriers to achievement for disabled learners:

- ◆ Some learners with neurotypical conditions, eg dyscalculia, may have difficulties in manipulating shape.
- ◆ Practical measurement activities could present barriers to visually impaired candidates or those with physical disability, especially where manual dexterity is required.
- ◆ Some learners with neurotypical conditions, eg dyscalculia, may have difficulties in performing calculations without recourse to a numerical aid/formula.

Some learners with communication difficulties may not be able to record, manipulate or present mathematical information, eg those with difficulties in reading and writing text, symbolic representation and diagrams.

If a learner has a disability affecting their ability to engage in learning or generate evidence for this Unit, centres could provide, where appropriate, the following support:

- ◆ practical helpers under direct learner instruction could assist with practical measurement activities
- ◆ adapted equipment would also be appropriate for measuring tasks
- ◆ the use of a calculator or similar aid
- ◆ a reader or scribe
- ◆ ICT and assistive technologies

It is important that centres have an understanding of SQA's assessment arrangements for disabled learners and those with additional support needs when making requests for adjustments to published assessment arrangements. Centres will find more guidance on this in the Assessment Arrangements section of SQA's website: www.sqa.org.uk/sqa//14977.html.

It is recognised that centres have their own duties under equality and other legislation and policy initiatives. The guidance given in these *Unit Support Notes* is designed to sit alongside these duties but is specific to the delivery and assessment of the Unit.

Alternative approaches to Unit assessment to take account of the specific needs of learners can be used. However, the centre must be satisfied that the integrity of the assessment is maintained and that the alternative approach to assessment will, in fact, generate the necessary evidence of achievement.

Appendix 1: Reference documents

The following reference documents will provide useful information and background.

- ◆ Assessment Arrangements (for disabled candidates and/or those with additional support needs) — various publications on SQA’s website: <http://www.sqa.org.uk/sqa/14976.html>
- ◆ [Building the Curriculum 4: Skills for learning, skills for life and skills for work](#)
- ◆ [Building the Curriculum 5: A framework for assessment](#)
- ◆ [Course Specifications](#)
- ◆ [Design Principles for National Courses](#)
- ◆ [Guide to Assessment \(June 2008\)](#)
- ◆ [Overview of Qualification Reports](#)
- ◆ *Principles and practice papers for curriculum areas*
- ◆ *Research Report 4 — Less is More: Good Practice in Reducing Assessment Time*
- ◆ *Coursework Authenticity — a Guide for Teachers and Lecturers*
- ◆ [SCQF Handbook: User Guide](#) (published 2009) and SCQF level descriptors (to be reviewed during 2011 to 2012): www.sqa.org.uk/sqa/4595.html
- ◆ [SQA Skills Framework: Skills for Learning, Skills for Life and Skills for Work](#)
- ◆ [Skills for Learning, Skills for Life and Skills for Work: Using the Curriculum Tool](#)
- ◆ SQA Guidelines on e-assessment for Schools
- ◆ SQA Guidelines on Online Assessment for Further Education
- ◆ SQA e-assessment web page: www.sqa.org.uk/sqa/5606.html

Appendix 2: Examples of possible learning and teaching contexts for Numeracy

Outcome 1: The learner will use numerical skills to solve given, straightforward real-life problems involving money/time/measurement.

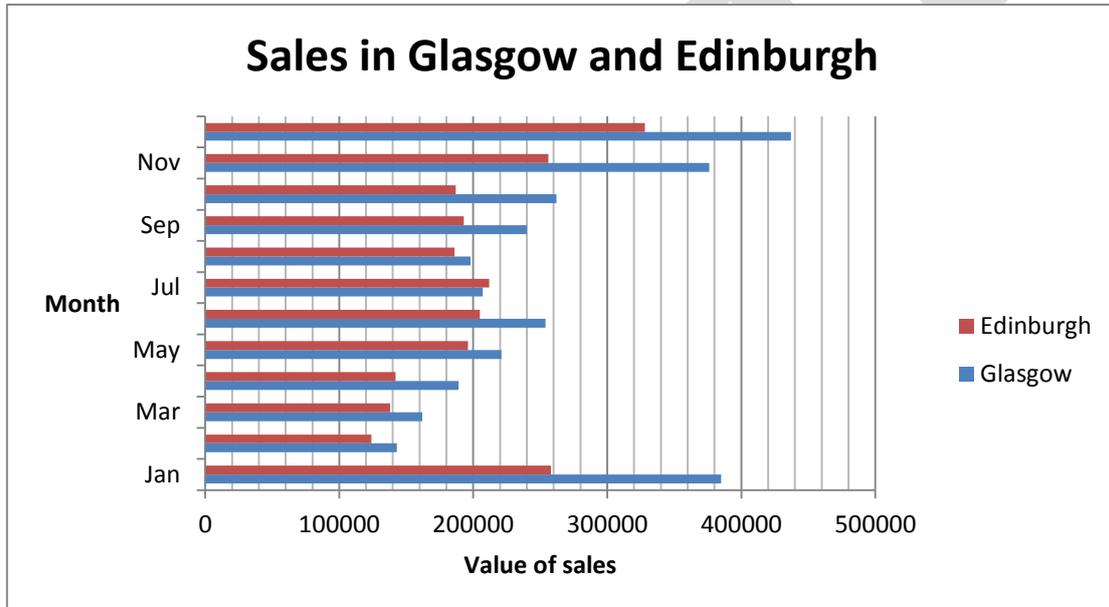
- 1 Measurement activities both practical and theoretical can be carried out in a variety of familiar real-life contexts. This can include counting squares, or by using common formula and the use of scale drawings. Examples of topics could include: packaging, DIY and cooking. Learners should be aware that exact measurements are not always possible and that the level of accuracy is often dependent on the measuring instrument and the nature of the task. A suitable scale is one where the numbered divisions are marked every 10. Learners must be able to measure to the nearest marked unnumbered division. Digital readouts are not acceptable.
- 2 Estimating the time taken for a journey on various types of road, eg a motorway compared with a B road, when given the average speed for each road type and the distance to be travelled.
- 3 Based on a child's savings account with a given interest rate calculate annual interest, and given a decrease in the interest rate calculate the reduction in savings.
- 4 Using a utility bill calculate for example average costs per day, discounts, adding VAT at 20% and calculating the costs if the bill is shared among a given number of residents.
- 5 Calculating the total cost of a shopping trip involving multiple purchases of a number of items. Fractions can be introduced as a fractional discount (eg $\frac{1}{12}$) to be applied at the end.
- 6 At a building site you need to make mortar using a sand and cement mixture to a given ratio of 1:3. Given the volume of cement, calculate the volume of the sand required.
- 7 Read the given table on costs for a mobile phone tariff. Calculate the best deal and decide which provider to use.
- 8 Given appropriate tables/charts and figures:
 - ◆ Calculate how much money has been made from the number 1 single in the past week.
 - ◆ Calculate how much the artist or group has made compared to the manufacturer.
 - ◆ What percentage does the performer receive?
- 9 Look up the latest Scottish football tables and answer questions such as:
 - ◆ What proportion of goals are scored at home?
 - ◆ What percentage of goals have been scored by the three top teams?

Outcome 2: The learner will interpret graphical data and situations involving probability to solve given, straightforward real-life problems involving money/time/measurement.

- 1 Extracting and interpreting information from a table containing a patient's temperature taken by a nurse every three hours over a 24-hour period. Calculate the amount of time during which the patient had a fever and determine when the patient's condition started to improve.

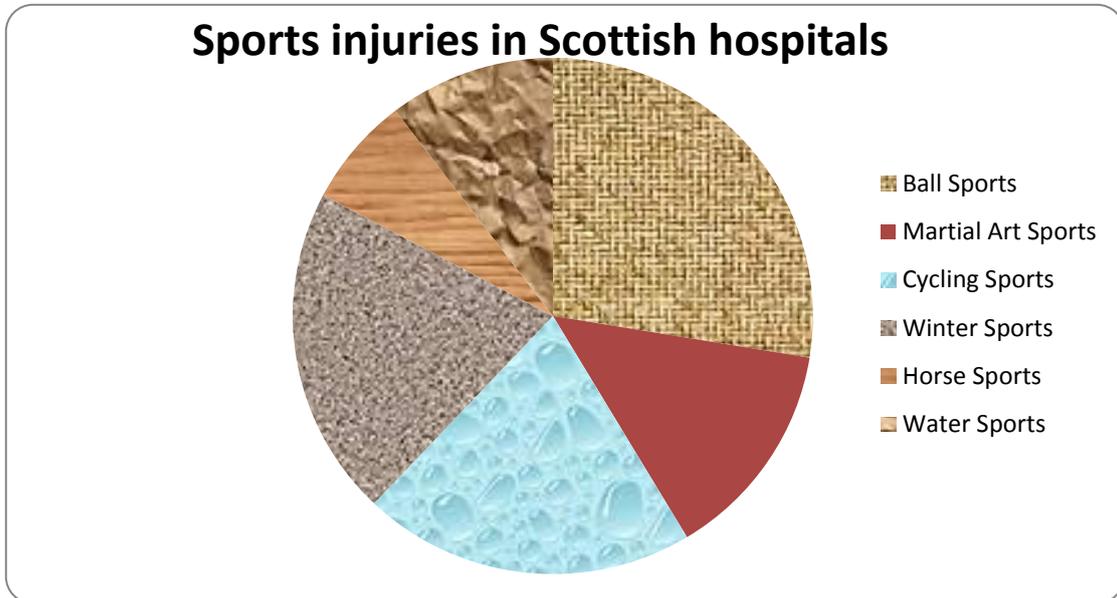
Time	07 00	10 00	13 00	16 00	19 00	22 00	01 00	04 00
Temp (°F)	99	101	102	103	103	102	101	99

- 2 A clothing company which has shops in two cities reports on its sales in each city from January to December in the form of a bar graph. Identify the months when sales were highest for each city and the months when sales were at their lowest. Determine the months when the combined sales of the shops for one month were higher than a given amount. The owner needs to close the shops for renovations for a month. Which month would be best for the renovations to take place?



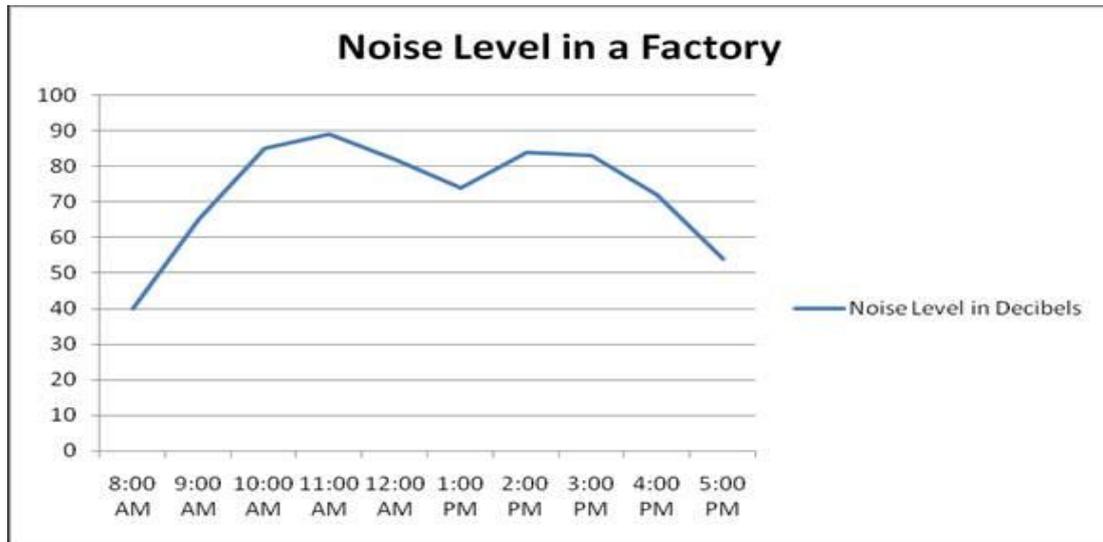
From a graphical form, such as this, learners should be able to extract and interpret data such as trends in sales over the year. They should also be able to make and explain decisions such as the best month to close a shop for renovations and during which months of the year is it most likely that more staff will need to be recruited.

- 3 A pie chart shows the number of sports injuries needing hospital treatment in Scottish hospitals over a year. Interpret the data and predict which sports are most likely to cause an injury requiring hospital treatment. Decide which sport is the safest to participate in.



From a graphical form such as this, learners should be able to extract and interpret data including the percentages of injuries for each sport category. They should also be able to make decisions and explain which sport is the safest. They can also interpret the information and explain the likelihood of an injury occurring in a particular sport and make risk assessments.

- 4 The line graph below shows noise levels in a factory over the period of a working day.



From a graphical form, such as this, learners should be able to extract and interpret data, such as the time of day when the noise level in the factory reaches a certain value.

They should also be able to explain why noise levels may peak at certain times of the day and make decisions on factors that may help reduce the noise levels.

Administrative information

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Superclass: to be advised

History of changes to Unit Support Notes

Unit details	Version	Description of change	Authorised by	Date

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