

NUMERACY
Using Number: Measuring
SCQF Level 2
10 Hour Unit (F3GL 08)

CORE SKILLS UNIT

ASSESSMENT SUPPORT PACK

Part 1: Information for tutors

What is involved?

This Unit is one of a group of four 10-hour Units:

- ◆ Using Number: Time
- ◆ Using Number: Money
- ◆ Using Number: Measuring
- ◆ Using Graphical Information

Together these deliver the complete Numeracy Core Skill at SCQF level 2.

Using Number: Measuring is about using very simple measuring skills in familiar, everyday personal, workplace, social, and educational situations. The focus of the Unit is on transferable number skills. It is designed for delivery in schools, colleges, workplaces, community, and other learning environments.

The learner will be expected only to work with familiar measuring instruments. The work will be simple and routine, using everyday concepts familiar to the learner.

Learner motivation can be maximised by making the numeracy activities as relevant as possible to the learner's likely uses for numeracy. The activities should consist of an appropriate mix from personal, workplace, social, and educational examples. In addition, integration of the numeracy activities with those of other SQA Units being undertaken should be explored. For example, when a learner is undertaking vocational or subject-specific Units, motivation for numeracy can be increased if the activities are related to the vocational or

subject-specific Units, and the learner can see the direct relevance of the numeracy.

Assessment and evidence

Learners at SCQF level 2 are required to use very simple measuring instruments in familiar situations. You may provide considerable prompting at this level.

You should try to identify naturally occurring opportunities for assessment where possible. For learners who are also working towards vocational or subject-specific Units, opportunities for assessment of number skills could arise while completing tasks that provide evidence for both the vocational/subject-specific Unit and this Unit. Some of the exemplars in this pack could be used or contextualised for this purpose.

The assessment process is likely to involve one or more of:

- ◆ written tasks
- ◆ oral questioning
- ◆ observation

When assessing by observation, you must keep a detailed checklist. Similarly if you use oral questioning, you must keep a record of both the questions and the learner responses. All evidence, whether produced by the learner or a record made by yourself, must be retained, signed, and dated by you.

Planning

You should work out where opportunities for meeting the standards are likely to arise. Where possible this should be built into the assessment process. You should discuss the assessment process with the learners so that they are quite clear about what is expected from them.

Guidance on the Unit

What learners need to know or be able to do

The Unit states that learners will:

- ◆ read and use a very simple measuring instrument (eg a ruler, a metre stick, or a thermometer) to make a measurement to the nearest marked number
- ◆ recognise common units in which different quantities are measured (eg length in centimetres or metres; weight in grams or kilograms; volume in litres)
- ◆ recognise and use whole numbers (eg 5)
- ◆ make a very simple numerical comparison between items
- ◆ use the results of your measuring activities to make decisions

It is important to note that this Unit is based on using instruments with analogue scales. Digital readouts are not acceptable.

Many learners at this level will have had no experience of using measuring instruments. With such learners it is especially important to set the activities and learning in familiar contexts. In principle, the reading of any instrument scale is the same process regardless of what is being measured. However, you should use a variety of familiar instruments setting each in context. In this way the learner will become familiar with the different quantities that can be measured and additionally see the similarity of the procedures for the different quantities.

Quantities

There is a wide range of quantities to be encountered in everyday personal, workplace, social, and educational situations. These might usefully be split up into the categories personal, environmental, and work specific.

Personal quantities include weight, height, and waist size. An example context is the learner taking a waist measurement before buying some new clothes.

Environmental quantities include temperature and atmospheric pressure. You can use these quantities in the context of weather watching.

Work-specific quantities arise naturally from the particular workplace activities of the learner. At the SCQF level 2, it is unlikely that the learners would have the responsibility of making precise measurements. Examples might be:

- ◆ checking the length of a piece of timber
- ◆ weighing a letter to check that the weight is less than 100 g for postal charge purposes

Units

Time should be taken to explore with the learners the units used for the quantities being measured. You should always choose units to suit the task involved. There are two aspects here:

- ◆ The units should be the commonly used ones for the context. This usually means using metric units such as grams and centimetres. However, if the learner is in a workplace that bases measurement on non-metric quantities, then these must be used.
- ◆ The magnitude of the unit must be appropriate. Waist measurement is not expressed in kilometres!

Instruments

In the personal and environment categories, there is a large range of instruments that you can use with the learners. In the environmental context, use could be made of a simple weather station.

Perhaps the most common measurement for learners is that of length. You can demonstrate the use of both rulers and measuring tapes, including the importance of positioning the zero of the scale precisely at the start of the measured length.

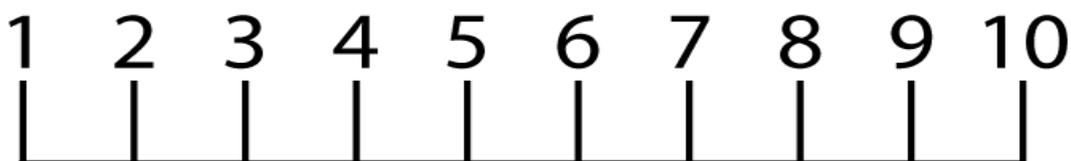
In any work situation, the instruments used will be the standard ones for the sector.

Scales

The Unit gives specific guidance about the type of instrument scales to be used in the learner activities.

Learners should use instruments with scales on which all the divisions are numbered. Learners are only expected to measure to the nearest marked number.

Any scale that the learners use must have all the divisions marked with numbers. This is a very simple scale and an example is given below.



This places a considerable restriction on the type of instrument that you can use with your learners. Many common instruments have scales with marked divisions that are not numbered. An example is the desk ruler that has a centimetre scale with tenths divisions marked but not numbered. However, it is still important to choose an instrument whose scale is appropriate for the type of measurement as well as fulfilling the Unit specification.

The concept of measuring to the nearest marked number must be carefully explained to the learners and at SCQF level 2 you should give them plenty of opportunities to practice. You should explain to the learners that when the value appears to be half-way between two marked numbers, it is conventional to choose the greater of the two.

Notation

Learners should be able to read and understand the notation for:

- ◆ whole numbers
- ◆ very simple decimals

They should be able to convert between values written in words and in numerical notation such as:

- ◆ twenty-three = 23
- ◆ one point five = 1.5

Basic operations

The learners should be familiar with the two basic arithmetic operations of addition and subtraction, eg calculations such as:

$$1.5 + 1.2 = 2.7$$

$$23 - 21 = 2$$

Comparisons/decisions

The candidate will make use of subtraction to decide, for instance, that one temperature is greater than another.

Gathering evidence

For verification purposes it is only necessary to retain evidence for each activity stated in the Unit. Learners must meet all of the requirements of the Unit (ie 100% achievement) but they do not have to do so as part of one exercise. Evidence can be collected where it occurs naturally in exercises performed in different contexts or it can be generated through one or more set assessment(s).

Where a tutor collects naturally occurring evidence for the Numeracy Core Skill, they must satisfy themselves that the learner is capable of fulfilling each of the activities stated in the Unit consistently. However, it will only be necessary for the tutor to retain one piece of evidence for each activity.

If a tutor opts to collect evidence through one or more set assessment(s) covering the activities stated in the Unit and a learner is successful in some but not all of the activities, that learner would only need to be reassessed in the activities they did not achieve.

Where a tutor collects evidence through one or more set assessment(s), it would normally be expected that considerable learning and teaching will have taken place prior to the learner undertaking the set assessment(s). As part of the learning and teaching, learners should have successfully completed tasks and exercises of a similar level to those they will tackle in each set assessment, on at least one occasion. In other words, learners will normally have shown in class activities that they are capable of working at the required level before they are deemed ready for each set assessment.

It may be appropriate for you to gather written evidence produced by the learner carrying out practical exercises. However, written evidence is not essential for this Unit and is inappropriate if it disadvantages the learner. You may wish instead to observe the learner carrying out a task and question them on completion. This requires you to create and complete record sheets comprising a checklist, questions asked, and learner responses.

From the learner's point of view, it is very useful to be provided with a means of keeping all the work relevant to this Unit together. You can help here by creating and providing the learner with a workbook that includes all the evidence-gathering items. An alternative is to provide worksheets that can be made into a portfolio or e-portfolio.

If you have chosen to integrate the Numeracy work with that of other Units being undertaken by the learner, it may be possible to assess this work as part of a larger single activity. In this case you must keep separate assessment records for this Unit.

Evidence may be gathered in a variety of ways. Some typical activities might be:

- ◆ using a measuring jug to measure out 200 ml of fruit juice
- ◆ using scales to measure your own weight to find if you are below or above average weight
- ◆ using a thermometer to measure the temperature of a room to decide if the heating should be turned on
- ◆ using a measuring stick to measure the depth of a fish tank to decide on the height of plants you might put in it
- ◆ using a tape measure to measure a table to see if it will fit into a space

It is appropriate to gather evidence of the learners making appropriate measurements to meet the requirements of the Unit. These can be measurements of different quantities or one quantity. You should provide the correct measuring instrument for the activity to be carried out.

Disabled learners and/or those with additional support needs

The additional support needs of individual learners should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website www.sqa.org.uk/assessmentarrangements.

Part 2: Assessment guidance

You can use the information given in this section in several ways:

- ◆ to help identify the type and amount of evidence that the learner needs to produce
- ◆ to help identify the level of complexity in evidence required for this Core Skill at this level
- ◆ to help you create an assessment task related to the learner's own situation

You can use the following information to create task sheets to be used with the learners in assessment sessions. The task sheet will contain the assessment items and you can leave appropriate space for the learners to insert their responses.

The guidance given in the rest of this section is based on the example of a centre that chooses to develop one task to cover the assessment of this Unit. In the following pages examples are given of the type of calculations and questions that could be set by the centre as part of the task.

Exemplar assessment

Task: Using very simple measuring skills to solve problems.

- 1 The temperature today is twenty-one degrees Celsius. Write that down as a number.
- 2 A kitchen table is one point two metres wide. Write that down as a number.
- 3 A cake recipe requires 40 g of caster sugar for the sponge and 25 g of caster sugar for the topping. How much sugar is used in total?
- 4 A desk is 1.3 m wide and is to fit into a space 1.9 m wide. What width of bookcase could be fitted into the space left?
- 5 You have been provided with a measuring jug. Its scale is marked out in hundreds of millilitres and each mark is numbered.
Make a measurement of the quantity of milk in the jug. Your answer should be given to the nearest hundred millilitres. Is there enough milk in the jug for a recipe that needs 500 ml?
- 6 You have been provided with weighing scales that are marked out in kilograms and each mark is numbered.
Make a measurement of your own weight. The answer should be given to the nearest kilogram. Do you weigh more than 65 kg?
- 7 You have been provided with a thermometer that is marked out in degrees and has each mark numbered.
Make a measurement of the air temperature outside. Your answer should be given to the nearest degree. Is the outside temperature greater than 20°C?
- 8 You have been provided with a ruler that is marked out in centimetres with each mark numbered.
Make a measurement of the length of the table. Your answer should be given to the nearest centimetre. Would the table fit into a space 1.4 m wide?

Notes for assessment

The learner must successfully complete all elements in the task to achieve this Unit.

The first four questions cover recognising and using numbers. The answers are:

- 1 21°C
- 2 1.2 m
- 3 65 g
- 4 0.6 m

For each of the activities involving measuring instruments, as well as ensuring that the learner has obtained the correct answer to the nearest marked number, the measuring instrument must be used correctly. The learners should have practiced with the chosen instruments and you should make sure in each case that they are using them properly.

Points to check for are:

- ◆ the learner is using the thermometer correctly, avoiding parallax error by reading it looking straight on, and not affecting the reading by say holding the thermometer by the bulb
- ◆ the ruler has its zero at the starting end of the rod
- ◆ the main check when using a measuring jug is to make sure that it is placed on a level surface
- ◆ a check should be made that the weighing scales are indicating the zero mark before use.

This means that as well as the learner providing four measurement results, the tutor should observe the activities and ensure that the instruments are used correctly.

Each of the four measuring questions requires a comparison to be carried out after the measurement.

Part 3: Exemplar recording documentation

This section provides example forms that can be used to gather evidence and record assessment decisions. The first form, the record sheet, is an example of a form for the learner to complete when being assessed. It also allows space for tutors to record their observation of the measurement activities.

The checklists allow the tutor to record assessment and Unit progress. In the first checklist, under the heading 'Activity' the tutor should insert the requirement that is being assessed, eg measuring temperature.

Record sheet

Task: Using very simple measuring skills to solve problems.

- 1 The temperature today is twenty-one degrees Celsius. Write that down as a number.

- 2 A kitchen table is one point two metres wide. Write that down as a number.

- 3 A cake recipe requires 40 g of caster sugar for the sponge and 25 g of caster sugar for the topping. How much sugar is used in total?

- 4 A desk is 1.3 m wide and is to fit into a space 1.9 m wide. What width of bookcase could be fitted into the space left?

- 5 You have been provided with a measuring jug. Its scale is marked out in hundreds of millilitres and each mark is numbered.

Make a measurement of the quantity of milk in the jug. Your answer should be given to the nearest hundred millilitres. Is there enough milk in the jug for a recipe that needs 500 ml?

	Tutor observation:
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- 6 You have been provided with weighing scales that are marked out in kilograms and each mark is numbered.

Make a measurement of your own weight. The answer should be given to the nearest kilogram. Do you weigh more than 65 kg?

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- 7 You have been provided with a thermometer that is marked out in degrees and has each mark numbered.

Make a measurement of the air temperature outside. Your answer should be given to the nearest degree. Is the outside temperature greater than 20°C?

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- 8 You have been provided with a ruler that is marked out in centimetres with each mark numbered.

Make a measurement of the length of the table. Your answer should be given to the nearest centimetre. Would the table fit into a space 1.4 m wide?

	Tutor observation:
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Tutor signature..... Date:.....

Assessment checklist

Learner:		
Task: Using very simple measuring skills to solve problems		
Activity	Evidence	Tutor comment/Date
1		
2		
3		
4		
5		
6		
7		
8		
Tutor signature:		Date:

Summary checklist

Learner:		
Learner number:		
Centre:		
Task	Date achieved	Tutor signature
Using very simple measuring skills to solve problems		

ADMINISTRATIVE INFORMATION



Core Skills

This Unit is part of a suite of four Units that when completed give automatic certification of the Core Skill of Numeracy at SCQF level 2. The other Units in this suite are:

Using Number: Time at SCQF level 2

Using Number: Money at SCQF level 2

Using Graphical Information at SCQF level 2

Credit value

1.5 SCQF credit points (0.25 SQA credits) at SCQF level 2

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