WORKPLACE CORE SKILLS
ASSESSMENT SUPPORT PACK

NUMERACY
SCQF Level 4

Part 1: Information for assessors

Part 2: Exemplar assessment tasks

Part 3: Exemplar recording documentation

Part 1: Information for assessors

What is involved?

The Unit is designed for the workplace and the content should involve tasks and skills that are suited to the requirements of the candidate's working environment. The focus of the Unit is on transferable numeracy skills:

- using number skills
- measuring
- understanding tables, charts, and diagrams
- producing tables, charts, and diagrams

These skills should be useful to candidates in their current and future jobs, as well as in their social and personal lives.

The Unit is designed for those who have some skill and experience in using numeracy skills within the workplace. The work undertaken in the assessments should be routine, eg at assistant worker level. The Unit might be suitable for candidates who are currently working towards an SVQ/NVQ at level 2 or level 3.

Numeracy tasks can be combined with the other Core Skills Units: Communication, Information and Communication Technology, Problem Solving, and Working with Others. If you adopt this approach, records must be kept for each Core Skills Unit.

Guidance on the Unit

Candidates at SCQF level 4 are required to work with straightforward measuring instruments, graphical information, and numbers in familiar situations. They may need limited support to carry out the tasks either from you, or from a supervisor or other workplace mentor.

The 'What do I need to do' section of the Unit lists the knowledge, understanding, and competence that the candidates must have and what they need to do to prove this. You may want to discuss these with the candidates. The following notes give detailed pointers on the things candidates need to know and be able to do.

What candidates need to do

Using number

Candidates must be able to recognise and use common notation of whole numbers, decimals, percentages, fractions, and ratios. Examples need only be as complex as: 153, 1.875, 35%, $\frac{5}{8}$, 2:3 and 5:2.

When giving the result of a calculation, they should be able to express the answer to a given degree of accuracy, such as rounding to a specified number of decimal places.

Calculations will consist of a combination of the basic arithmetic operations. The particular combination may not be obvious without taking time to inspect the problem. The candidates should be guided to think clearly about which operations are required and the order of carrying them out. Situations requiring two to four operations are appropriate.

It may be that you wish to use a formula in a calculation. The candidates should be able to deal with a simple formula expressed in symbols.

It is not appropriate to deliver the numeracy skills abstractly. You are encouraged to make all the learning as relevant to the workplace as possible. By relating even the simplest calculation to the candidate's practical experience, the result becomes the solution to a relevant problem.

It is good practice to encourage candidates to check their calculations. Although not part of the assessment, it is important that candidates have some confidence in their own calculations.

In the Unit, it is assumed that the candidates are able to carry out the four basic arithmetic operations of addition, subtraction, multiplication, and division. However, evidence of all four is not required.

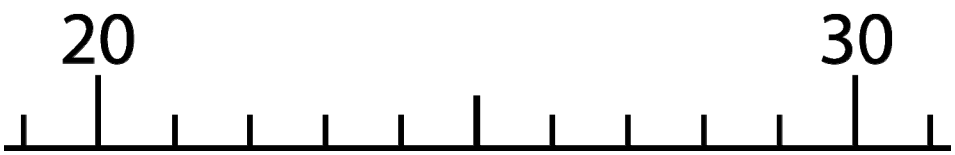
Measuring

Candidates should be familiar with the units used in their measurements. These units may be specific to the workplace.

Candidates may make measurements from scales on a measuring instrument or the axis of a graph.

The Unit is specific on the nature of the scale to be used. The candidates should use instruments with scales on which all the main divisions are numbered. The candidates are expected to measure or use the scale on a graph to the nearest marked division whether it is numbered or not.

Commonly, thermometers have markings as shown below. The numbered marks are at the tens. Candidates would be able to use this to measure to the nearest degree.



You will need to show the candidates how to measure to the nearest division using the convention that if the reading appears exactly half-way between two divisions, the higher is used.

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

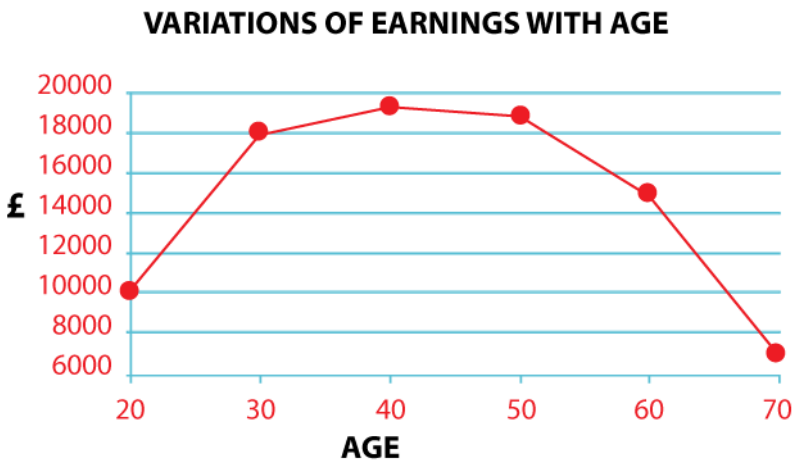
At SCQF level 4 candidates are required to make a choice of graphical form (table, graph, chart, or diagram) to represent the information. The candidates should understand how to create the graphical forms and know the appropriate applications for each.

When extracting information from graphical forms, they are expected also to interpret it. This is likely to be achieved when the candidates have to read more than one value and then have to make an observation or further calculation.

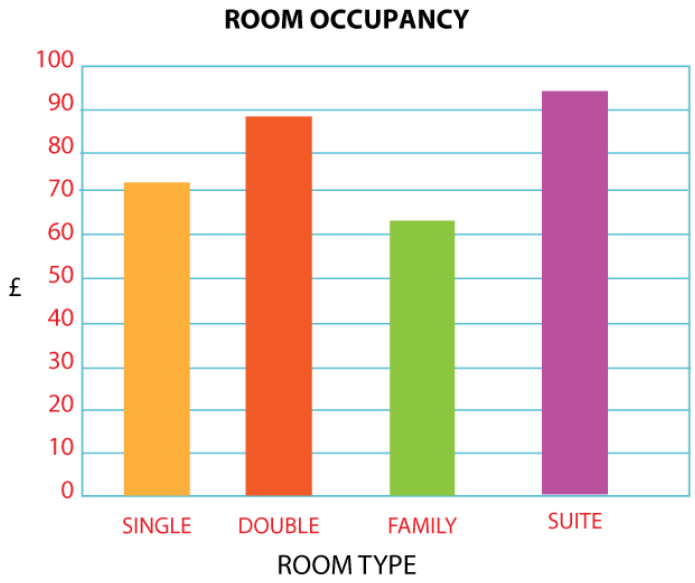
Tables are a general-purpose method of displaying numerical information graphically. There is a clear relationship between the columns. For SCQF level 4 tables are restricted to three or four columns. The example below, illustrating the variation in room prices for a hotel throughout the year, is of four columns.

Hotel prices by room and time of year			
Period	**Single room**	**Twin room**	**Family room**
1st Jan to 31st Mar	£40	£60	£70
1st Apr to 15th Jun	£50	£75	£85
16th Jun to 30th Sep	£60	£90	£100
1st Oct to 31st Dec	£55	£80	£90

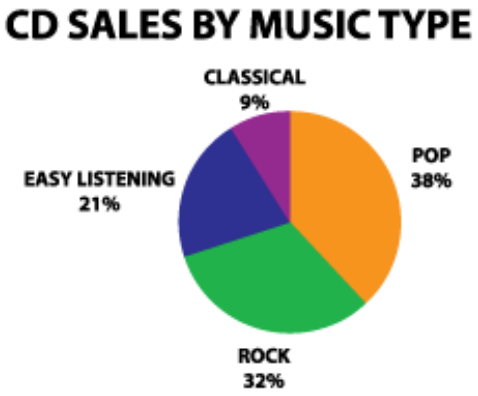
By definition, line graphs are used to show continuously varying information. However, sometimes they are used to display discrete but ordered information. This type of graph is often used to show trends and thus the x-axis is usually a time axis. It is important to place markers on the graph line showing the data points. Also the candidates must understand that it is only valid to extract information at these data points and not in between. The example below illustrates the way in which average income varies with age.



Bar charts are used to give a snapshot comparison of values. These are usually values of different but related quantities. The example below shows the room occupancy rates for a hotel by type of room.



Pie charts are very useful at showing the proportions making up a whole. A good indication that a pie chart can be used is if the information to be presented is in the form of percentages adding up to 100%. The example below shows the proportions of CDs sold by music genre.



Diagrams are best used to show information that consists of spatial relationships or physically connected items. An example likely to be used in some workplaces would be an office layout plan where three-dimensional shapes are represented in two dimensions. Other possibilities are maps or a circuit diagram.

How do candidates show they have achieved the Unit?

The Unit requires the candidates to provide evidence for each of the four tasks.

Task 1: Using number

Using numbers, carry out calculations involving one or two steps, and draw conclusions from their answers.

Task 2: Measuring

Take measurements using instruments with scales.

Task 3: Use graphical format to find out information

Extract information from tables, graphs, charts, or diagrams.

Task 4: Use graphical format to communicate information

Convey information through tables, graphs, charts, or diagrams.

There is no set number of times candidates should perform each of the individual tasks. They should be performed as often as is required for the assessor to be confident that their performance is consistently accurate.

Assessment requirements

Using number

The candidates can carry out the calculations mentally or in writing, using a calculator or another electronic device, eg a computer. The candidates can give exact or approximate answers as appropriate. Candidates should be encouraged to check their answers, although evidence of this checking is not required. The numerical tasks must involve a number of steps that will not always be obvious and may need to be clarified before any calculation takes place. It is assumed that the candidates will be able to add, subtract, multiply, and divide but evidence of all of the basic operations is not required.

Measuring

The candidates must use instruments with scales on which all the main divisions are numbered. The candidates are expected to measure or use the scale on a graph to the nearest marked division. Measuring instruments must have analogue scales; electronic instruments with digital readouts are not applicable for this Unit.

Use graphical format to find out information

It is assumed that the candidates will be familiar with common types of tables, graphs, charts, and diagrams in everyday use but evidence of each of these is not required. You should select graphical formats that are familiar to the candidates from which they can extract information.

Use graphical format to communicate information

When communicating information, the candidates must decide on the appropriate graphical form to be used.

Gathering evidence

It may be appropriate for you to gather written evidence produced by the candidates while carrying out the practical tasks. However, written evidence is not essential for this Unit and is inappropriate if it disadvantages the candidates.

You may wish instead to observe the candidates carrying out a task and use oral questioning. This requires you to create and complete a record of questions asked and candidate responses.

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

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

You should try to identify naturally occurring opportunities for assessment where possible. 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 the following:

- observation
- recording
- oral questioning

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 candidate responses. All evidence, whether produced by the candidates or a record made by yourself, must be retained, signed, and dated by you.

Planning

You should work out where opportunities for meeting the Unit standards are likely to arise. Where possible, these should be built into the assessment process.

You should explain and discuss this assessment process with the candidates so that they are clear about what is expected of them.

Part 2: Exemplar assessment tasks

Note for assessors

You can use the exemplar assessments given in this section in several ways:

- to illustrate to candidates the type of materials that could be used to generate evidence
- to help identify the type and amount of evidence that candidates should have gathered in their portfolio
- to help identify the level of complexity in evidence required for the Core Skill at this level
- to help you to identify/create an assessment task related to the candidate's own work environment
- as an off-the-shelf assessment, although every effort should be made to source/provide candidates with assessment materials that relate to their specific area of work

Task 1: Using number — is designed to cover numerical calculations. Candidates should successfully complete all four questions to cover all aspects of the task.

Task 2: Measuring — gives the candidates the opportunity to use either a measuring instrument or take readings from the scale of a graph.

Task 3: Use graphical format to find out information and **Task 4: Use graphical format to communicate information —** have contrasting graphical forms. The same type of graphical form could be used in both tasks but remember that the candidates have to create a graphical form from scratch and cannot find information from a form that they then further complete.

Task 1: Using number

1 Your line manager is due to go on a business trip abroad. You have bought £400 of American dollars for the trip. The exchange rate was £1 buys $1.88. Unfortunately the trip is cancelled. You have found out that the foreign exchange bureau will buy the dollars back at £1 for $1.95.

a) If you convert the dollars back into pounds, calculate the loss that will be made in pounds.

b) Calculate the percentage loss expressed to one decimal place.

2 In a research company the ratio of technicians to researchers is 7:2.

a) If there are 200 researchers, calculate the total number of staff.

b) The technicians are paid £8.60 per hour and the researchers are paid £14.70 an hour. The company is making a promotional video showing how much money they invest in research. As part of this they want to know how much the total salary bill costs per minute. Calculate this value.

3 Your small business makes the stationery order shown below. It is to be paid out of the monthly budget of £200 (including VAT).

250 pens @ 10p (ex VAT)

100 notepads @30p (ex VAT)

500 pencils @5p (ex VAT)

75 padded bags (large) @ 20p (ex VAT)

VAT is charged at 17.5%

a) Calculate the total cost for the order (including VAT).

b) Will this order be within the monthly budget?

4 A company decides to find out if its staff wish to have flexi-time. A vote is to be carried out and at least 4/7 of the staff need to vote 'yes' for flexi-time to be introduced.

The staff consists of 328 female and 295 males.

188 females and 155 males vote yes.

Will flexi-time be introduced? Show your working for your answer in the box.

Task 2: Measuring

Carry out one of the following:

1 You need to calculate the average temperature in your office over the next week. Do this by taking a measurement of the temperature in your office each morning at 10am. Use the thermometer provided by your assessor.

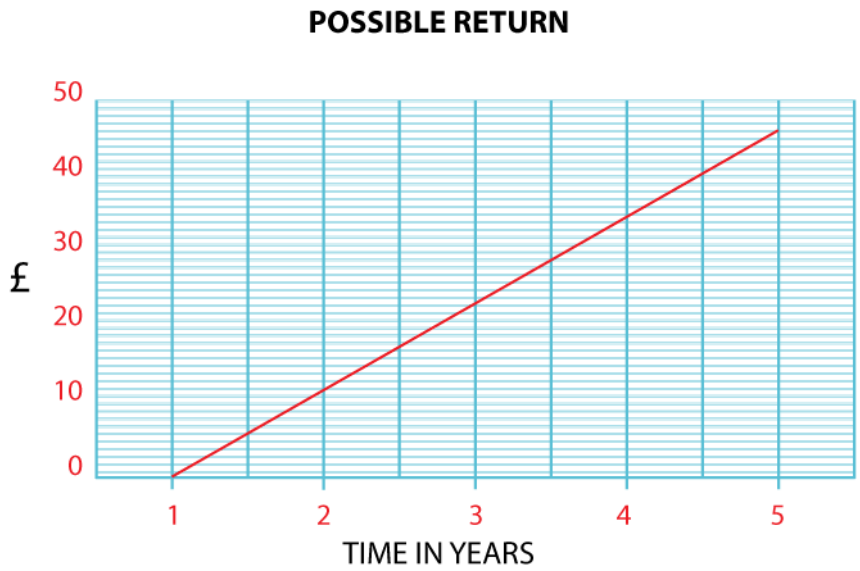
Mon	Tue	Wed	Thu	Fri	Average

OR

2 The line graph below shows the possible returns from a savings plan. Read off the return at:

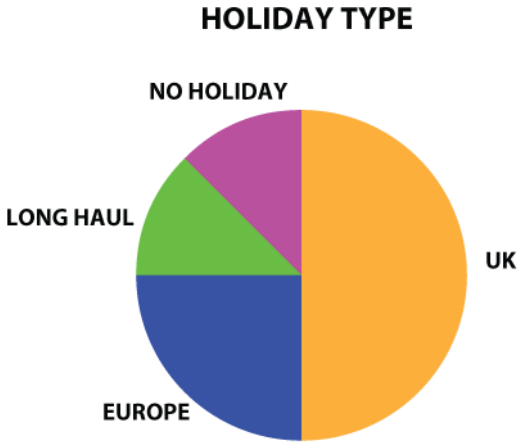
a) 2 years

b) 4 years



Task 3: Use graphical format to find out information

1 You are finding out facts and figures for a travel agency. The following pie chart shows the proportions of residents of a city who take various types of holiday.



a) What percentage of residents take no holiday?

b) What percentage of residents holiday outside the UK?

c) If there are 100,000 residents, how many holiday abroad in Europe?

Task 4: Use graphical format to communicate information

1 You are preparing background information about conference destinations and you need to research the climate. The following tables give the monthly average maximum temperatures for four city destinations.

City A	Temp. °C
Jan	21
Feb	21
Mar	22
Apr	23
May	24
Jun	27
Jul	29
Aug	30
Sep	28
Oct	26
Nov	24
Dec	22

City B	Temp. °C
Jan	26
Feb	26
Mar	25
Apr	22
May	19
Jun	17
Jul	16
Aug	17
Sep	20
Oct	22
Nov	23
Dec	25

City C	Temp. °C
Jan	26
Feb	26
Mar	25
Apr	23
May	20
Jun	18
Jul	17
Aug	18
Sep	19
Oct	21
Nov	23
Dec	25

City D	Temp. °C
Jan	21
Feb	22
Mar	25
Apr	28
May	31
Jun	32
Jul	32
Aug	32
Sep	32
Oct	29
Nov	25
Dec	22

a) Choose and draw up a suitable graphical form to show how the temperature in City A varies throughout the year.

b) Repeat this for City B.

c) Looking at the graphical forms what can you say about City A and City B?

Marking scheme

Candidates must successfully complete all four tasks to achieve the Unit.

The calculation examples are presented in these notes not as model answers but to indicate how they satisfy the requirements of the Unit.

Task 1: Using number

Q1 Covers whole number, decimals, fraction and percentage notation, and calculations; deciding order of calculations; rounding answer to two decimal places; multiplication, division, and subtraction; solving a numerical problem.

400 × 1.88 = $752 purchased

752 ÷ 1.95 = £385.64 converted back

400 – 385.64 = £14.36 loss [answer to a)]

14.36/400 × 100, ie 3.6% [answer to b)]

Q2 Covers whole number, decimals, fraction and ratio notation, and calculations; deciding order of calculations; division, addition, and multiplication; solving a numerical problem.

200/2 × 7 = 700 technicians

200 + 700 = 900 staff [answer to a)]

700 × 8.60 = £6,020 technician pay per hour

200 × 14.7 = £2,940 researcher pay per hour

6,020 + 2,940 = £8,960 total per hour

8,960 ÷ 60 = £149.33 spent per minute [answer to b)]

Q3 Covers whole number, decimals, fraction and percentage notation, and calculations; deciding order of calculations; multiplication, division, and addition; solving a numerical problem.

250 × 0.1 = 25

100 × 0.3 = 30

500 × 0.05 = 25

75 × 0.2 = 15

25 + 30 + 25 + 15 = £95 total ex VAT

17.5/100 × 95 = £16.63 VAT

95 + 16.63 = £111.63 [answer to a)]

This is within the monthly budget [answer to b)].

Q4 Covers whole number, fraction and percentage notation, and calculations; deciding order of calculations; multiplication, division, and addition; solving a numerical problem.

328 + 295 = 623 total staff

188 + 155 = 343 vote yes

4/7 × 623 = 356 need to vote yes

Flexi-time will not be introduced [answer].

Task 2: Measuring

Q1 Covers reading and using a scale on an instrument.

Task 3: Use graphical format to find out information

Q1 Covers extracting and interpreting information from a pie chart.

a) One-eighth = 12.5%

b) One-quarter plus one-eighth = 37.5%

c) One-quarter of 100,000 = 25,000

Task 4: Use graphical format to communicate information

Q1 Covers communicating information through a graphical form.

a), **b)** The most likely choice would be line graphs because of the time element, although bar charts could be used.

c) The colder weather of City B in July suggests that it is south of the equator and City A is north of the equator.

Part 3: Exemplar recording documentation

This section gives some examples of forms that could be used by candidates and/or assessors to gather evidence and record assessment decisions.

You are encouraged to adapt these materials to suit you and your candidates' preferred approach, ie boxes can be made bigger, format can be changed to a non-table format, font size etc.

Assessment plan

You should work out where naturally occurring opportunities for meeting the standards are likely to arise and, where possible, build them into the assessment process.

You should explain and discuss the assessment process with candidates so they are clear about what is expected of them.

Assessment checklists

Candidates could use the assessment checklists as a means of cross-referencing evidence in their portfolio to the Unit.

Assessors could use the assessment checklists to record assessment decisions and any relevant comments.

Summary checklist

The summary checklist enables you to record the results from the assessment checklists on a single form.

Assessment plan

Numeracy (SCQF level 4)

Candidate: _____

Task to be assessed: _____

Proposed date of assessment: _____

Proposed method of assessment	Tick	Notes
Assignment or project		
Observed performance		
Witness testimony		
Written questions		
Oral questioning		
Product evaluation, eg written document		
Previous evidence		
Other evidence		

Details agreed and signed by:

Assessor _____

Candidate _____

Line manager (if required) _____

Date _____

Assessment checklist

Numeracy (SCQF level 4) Task 1: Using number

Candidate name:_____ Date:_____

Task 1: Use number to carry out a variety of straightforward number tasks that involve calculations requiring a minimum of two steps.			
	Evidence	**Assessor initials and date**	**Comments**
Carried out calculations involving each of the following: ♦ whole numbers (eg 5) ♦ decimals (eg 2.465) ♦ percentages (eg 35%) ♦ simple fractions (eg $\frac{5}{8}$) ♦ simple ratios (eg 5:4)			
Decided which calculations needed to be carried out and in what order (eg add, then multiply)			
Rounded answers to two decimal places			
Drew conclusions from calculation results			

Assessment checklist

Numeracy (SCQF level 4) Task 2: Measuring

Candidate name:_____ Date:_____

Task 2: Read and use a straightforward scale on a graph or a measuring instrument.			
	Evidence	**Assessor initials and date**	**Comments**
Used a measuring instrument to measure to the nearest numbered division or Used the scale on a graph to determine quantities to the nearest numbered division			

Assessment checklist

Numeracy (SCQF level 4)

Task 3: Use graphical format to find out information

Candidate name:_____ Date:_____

Task 3: Use graphical format to find out information.			
	Evidence	**Assessor initials and date**	**Comments**
Extracted information from at least ONE of the following: ♦ table containing three or four categories of information ♦ chart (eg bar or pie chart) ♦ graph (eg a line graph with a scale) ♦ diagram (eg of a two-dimensional shape)			

Assessment checklist

Numeracy (SCQF level 4)

Task 4: Use graphical format to communicate information

Candidate name:_____ Date:_____

Task 4: Use graphical format to communicate information.			
	Evidence	**Assessor initials and date**	**Comments**
Selected and created a suitable format to communicate information using ONE of the options listed below: ♦ Table containing three or four categories of information ♦ Chart (eg bar or pie chart) ♦ Graph (eg a line graph with a scale) ♦ Diagram (eg of a two-dimensional shape)			

Summary checklist

Numeracy (SCQF level 4)

Candidate name:_____

Candidate number:_____

Centre:_____

Task	Date achieved
1 Using number	
2 Measuring	
3 Use graphical format to find out information	
4 Use graphical format to communicate information	
Assessor's signature:_____	Date:_____

ADMINISTRATION INFORMATION

Credit Value

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