

NUMERACY
Using graphical information
SCQF Level 3
10 Hour Unit

CORE SKILLS UNIT

ASSESSMENT SUPPORT PACK

Part 1: Information for tutors

What is involved?

This Unit is one of a group of three:

- ◆ Using number: calculation [20 hour Unit]
- ◆ Using number: measuring [10 hour Unit]
- ◆ Using graphical information [10 hour Unit]

Together these deliver the complete Numeracy Core Skill at SCQF level 3.

Using graphical information is about reading and using simple graphical information in everyday personal, workplace, social and educational situations. The focus of the Unit is on transferable numeracy skills. It is designed for delivery in schools, colleges, workplaces, community and other learning environments.

The learner will be expected only to work with simple graphical information. 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. Additionally, integration of the numeracy activities with those of other SQA Units being undertaken should be explored. For example, when a learner is undertaking vocational Units, motivation for numeracy can be increased if the activities are related to the vocational Unit and the learner can see the direct relevance of the numeracy.

Assessment and evidence

Learners at SCQF level 3 are required to use simple graphical concepts in familiar situations. They are not required to create a table or graphical form from scratch. When required to communicate information graphically, they should be provided with partially completed graphical forms or tables.

If appropriate, the learner should be allowed to use a calculator. It may be appropriate for the learner to use a computer to create the graphical information for the purpose of assessment.

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 graphical skills could arise while completing vocational or subject specific tasks which provide evidence for both the vocational or 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 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 standard are likely to arise. Where possible this should be built into the assessment process. You should discuss this 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

Get information from at least one of the following:

- ◆ a simple table containing two categories of information (eg a timetable; a distance table)
- ◆ a simple chart (eg bar or pie chart)
- ◆ a simple graph (eg a line graph with a simple scale)
- ◆ a simple diagram (eg a diagram of a 2-dimensional shape such as a floor plan; a 2-dimensional representation of a familiar 3-dimensional shape such as a cube; a simple map)

Give information through at least one of the following:

- ◆ a simple table containing two categories of information (eg a timetable; a distance table)
- ◆ a simple chart (eg bar or pie chart)
- ◆ a simple graph (eg a line graph with a simple scale)
- ◆ a simple diagram (eg a diagram of a 2-dimensional shape such as a floor plan; a simple map)

Information can be presented graphically in a number of ways (eg tables, graphs, charts and diagrams.) The format chosen will depend on the type of information being presented. Although you will specify and partially complete them for your learners, it is important to indicate the appropriate applications for each format. In this Unit, learners will need to know how to interpret graphical information and how to represent information graphically. The formats should be dealt with at a simple level.

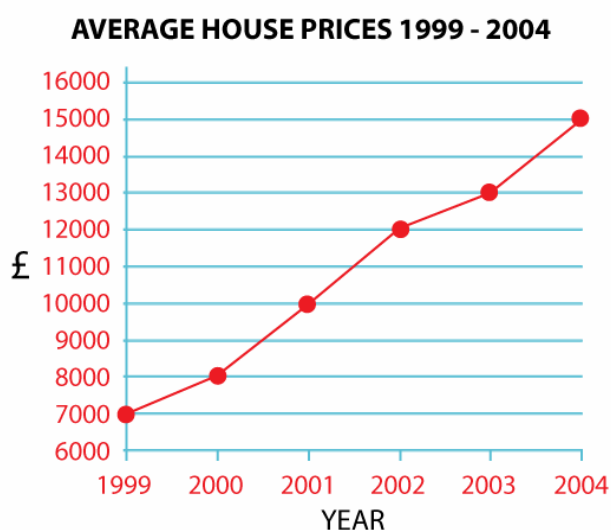
Tables

Tables are a general purpose method of displaying information graphically. In this Unit tables should be restricted to two categories of information. The example below has the categories of Country and Number of users.

Largest users of internet by country in 2005	
Country	Number of users (in millions)
USA	190
China	120
Japan	90
India	50
Germany	45
UK	35

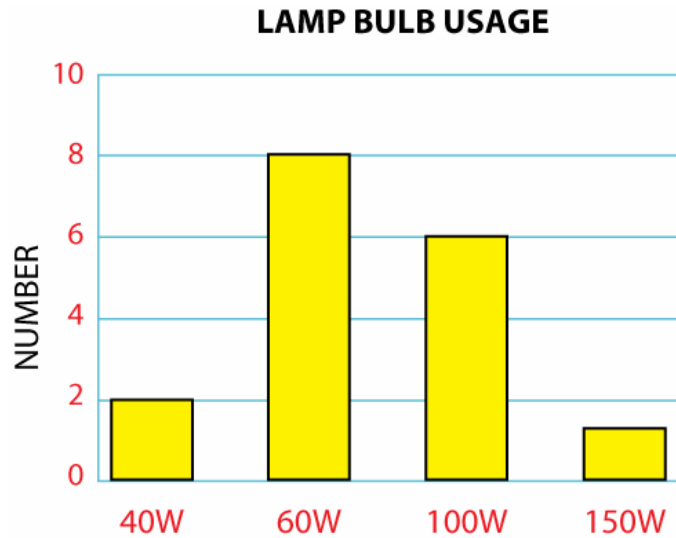
Graphs

Strictly speaking, a line graph is used to show continuously varying information. However, line graphs are often used to display discrete but ordered information. This is particularly suited to illustrating trends over a period of time. It is important to place markers on the graph line showing the data points. Also the learner must understand that it is only valid to extract information at these data points and not in between. The example alongside illustrates the way in which average UK house prices have varied from 1999 to 2004.

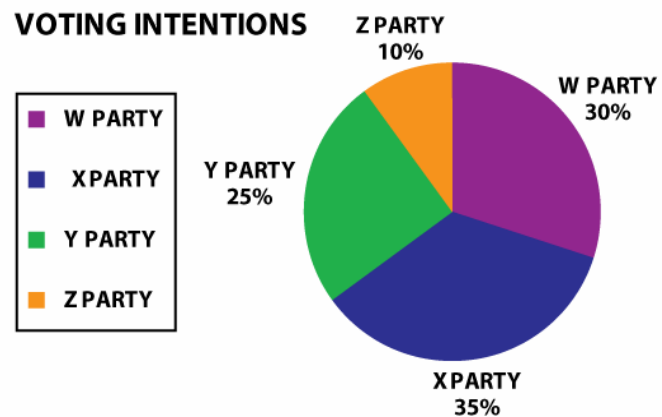


Charts

Bar charts are used to show discrete information. This could be a snapshot of a quantity at different points in time or for comparison of different quantities. The example shows the number of different wattage lamp bulbs used in a domestic household.

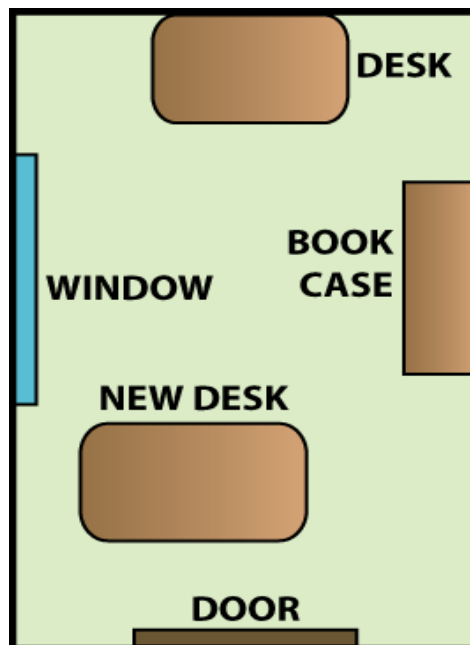


Pie charts are best used to show the proportions making up a whole. They are often based on information supplied in percentage form. The example shows the voting intentions of a group of people.



Diagrams

Diagrams are a method of presenting information which has a spatial relationship. A learner activity might be to draw the plan of a room layout for instance. Another example is the use of a map to give the relative distances and directions between geographical locations. The learners will need to know simple 2-dimensional shapes. They will also need to know about 2-dimensional shapes representing three dimensions as they do on maps. This is only for extracting information. A simple room plan is shown on the right.



Gathering evidence

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 which includes all the evidence gathering items. An alternative is to provide worksheets which 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 the numeracy as part of a larger single activity. In this case you must keep separate records of assessment decisions for this Unit.

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

- ◆ completing a fuel consumption chart for a car
- ◆ adding information to a bar chart which illustrates the number of males and females choosing to buy certain brands of jeans
- ◆ amending the floor plan of a room, to show the position of a new piece of furniture

Part 2: Exemplar assessment tasks

Note

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

- ◆ to help identify the type and amount of evidence which 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 to create an assessment task related to the learner's own situation
- ◆ as an off-the-shelf assessment, although every effort should be made to source/provide the learner(s) with their own meaningful context

Exemplar assessment

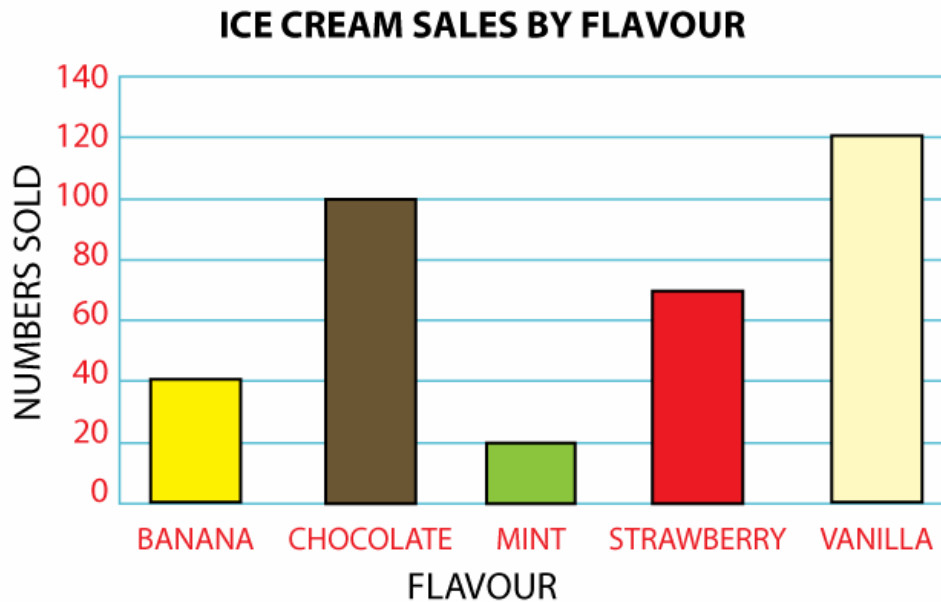
Task 1: Extract information from at least one of the types of graphical format.

- 1 The table shows the cost for a 10 minute pay-as-you-go call using a mobile phone from six different operators.

10 minute call	
Mobile phone operator	Cost
Xphone	£1.98
ThirdLine	£1.77
PhoneU	£1.84
HandyPhone	£1.73
BigPhone	£1.59
PhonePhone	£1.71

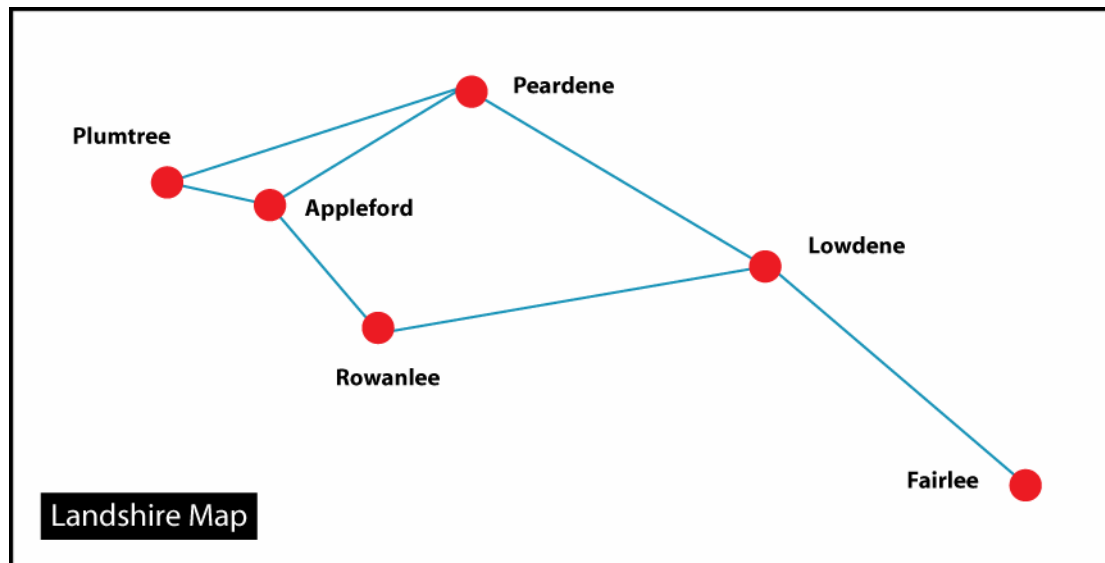
Which operator offers the best value for a 10 minute call?

- 2 A shop sells five different flavours of ice cream. The owner wishes to measure the popularity of the different types and makes a note of how many ices are sold for each flavour on one day. The bar chart shows the number of each type sold.



- a) Which was the most popular flavour?
- b) Which was the least popular flavour?
- c) How many banana ice creams were sold?

- 3 The map of Landshire shows the towns and the roads between them drawn to scale.



- a) Which town is farthest away from Plumtree?
- b) Which is the nearest town to Fairlee?

Task 2: Communicate information using at least one type of graphical format.

- 1 A van driver has to record the number of miles travelled each day. In one week he notes that on Monday he covered 110 miles, on Tuesday it was 90 miles, on Wednesday it was 40 miles, on Thursday it was 80 miles and on Friday it was 120 miles.

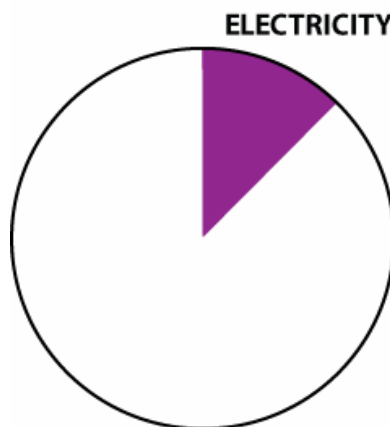
Complete the table to show the van driver's week.

Miles driven in a week	
Day	Miles
Monday	
	90
Thursday	80

- 2 A householder decides to measure how much money is spent on utility bills in one year. It works out at £100 for electricity, £300 for gas, £200 for water and £200 for the telephone.

Complete the pie chart to illustrate the different proportions spent on the four utilities.

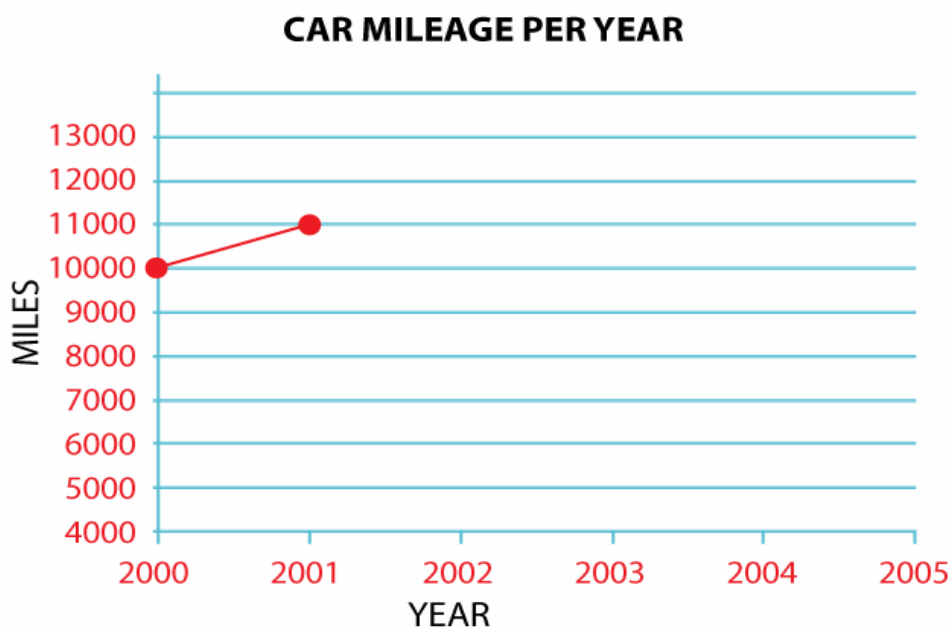
UTILITY COSTS



- 3 A motorist wonders how many miles has been clocked up by his car over the years. The following information was found by looking back at old MOT certificates. The miles travelled each year are given in the table.

Year	Miles travelled
2000	10,000
2001	11,000
2002	12,000
2003	11,000
2004	10,000
2005	8,000

Complete the graph from year 2000 to 2006, to illustrate the mileage over the years.



Notes for assessment

The learner must successfully complete at least one of the items in each of the two tasks to achieve this Unit. The worked-out questions here are not presented as model answers but have the purpose of illustrating the way in which the questions satisfy the requirements of the Unit.

Task 1

This consists of three activities, at least one should be chosen, where information is extracted from a graphical format. Each is a different type taken from the four mentioned in the Unit.

- 1 **Table** — the correct answer is BigPhone. To obtain the answer, the learner inspects the cost category, finds the lowest price and refers across to the operator category to determine the correct mobile phone operator.

- 2 **Chart** — in this case a bar chart. The correct answers are:
 - a) Vanilla — the learner inspects the chart to find the flavour category with the greatest height.

 - b) Mint — the learner inspects the chart to find the flavour category with the smallest height.

 - c) 40 — the learner inspects the flavour category for banana and reads the corresponding value off the number category.

- 3 **Diagram** — in this case a map. The correct answers are:
 - a) Fairlee — the learner uses the fact that the map is to scale so choosing the location which is at the greatest distance across the map from Plumtree will give the greatest geographical separation.

 - b) Lowdene — the learner uses the fact that the map is to scale so choosing the location which is at the least separation across the map from Fairlee will give the least geographical separation.

Task 2

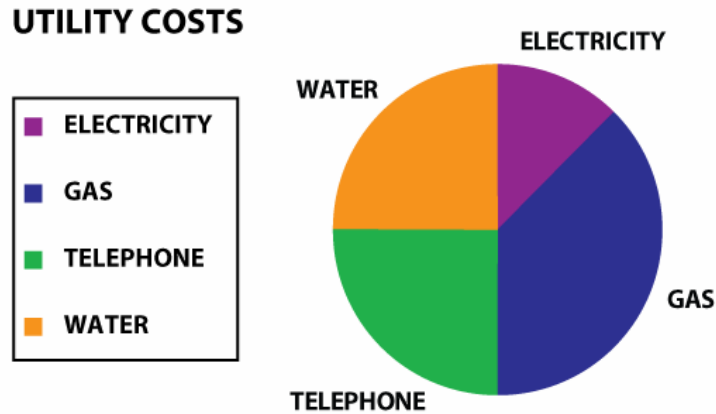
This consists of three activities, one of which should be chosen where information is communicated using a graphical format. Each is a different type taken from the four mentioned in the Unit.

1 **Table** — the learner should complete it as shown:

Miles driven in a week	
Day	Miles
Monday	110
Tuesday	90
Wednesday	40
Thursday	80
Friday	120

The learner transcribes the text based information into the graphical format of the partially completed table.

- 2 **Chart** — in this case a pie chart. The learner should complete it as shown. Colouring is not a requirement.



The learner totals the four costs and works out the proportions and hence the size of each sector (pie slice.)

$$\text{Total} = \text{£}100 + \text{£}300 + \text{£}200 + \text{£}200 = \text{£}800$$

The sizes are based on a simple fraction which can be easily marked out and drawn.

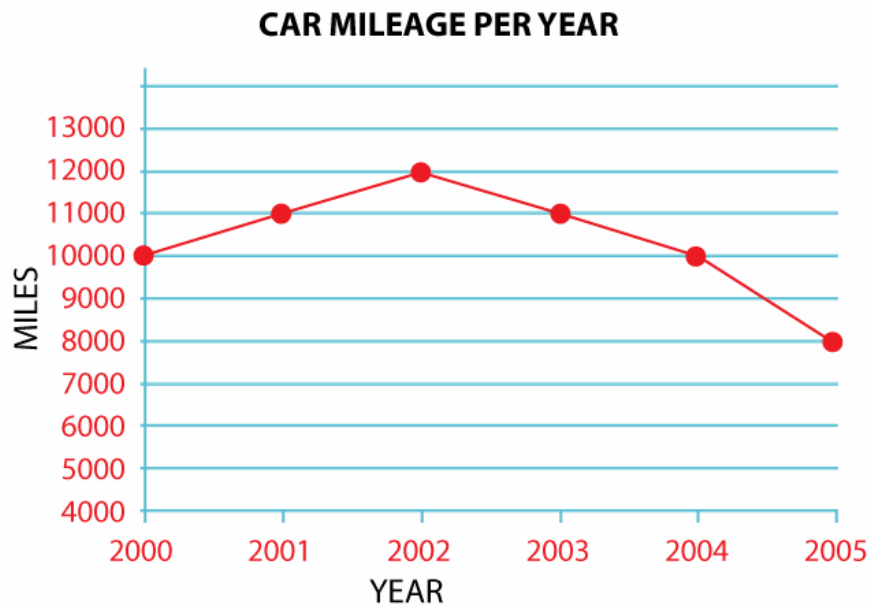
$$\text{Electricity} — 100/800 = 1/8$$

$$\text{Gas} — 300/800 = 3/8$$

$$\text{Water} — 200/800 = 2/8 = 1/4$$

$$\text{Telephone} — 200/800 = 2/8 = 1/4$$

3 **Graph** — The learner should complete it as shown.



The learner transcribes the text based information into the graphical format of the partially completed graph.

Part 3: Exemplar recording documentation

This section provides example forms which can be used by the learner and tutor 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 for task 1. Alternatively, it can be completed by the tutor to record oral responses. For task 2 a separate record is not required as the exemplar sheet itself is to be completed by the learner.

The two checklists are for completion by the tutor, recording assessment and Unit progress. In the first checklist, under the heading 'Activity' the tutor should insert the component of the skill eg bar chart.

Record sheet

Task 1: Extract information from at least one type of graphical format.

1 Which operator offers the best value for a 10 minute call?

2 a) Which was the most popular flavour?

2 b) Which was the least popular flavour?

2 c) How many banana ice creams were sold?

3 a) Which town is farthest away from Plumtree?

3 b) Which is the nearest town to Fairlee?

Tutor comments

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

Assessment checklist

Candidate:		
Task 1: Extract information from at least one type of graphical format		
Activity	Evidence	Tutor comment / Date
1		
2		
3		
Task 2: Communicate information using three types of graphical format		
Activity	Evidence	Tutor comment / Date
1		
2		
3		
Tutor signature:		Date:

Summary checklist

Candidate:		
Candidate number:		
Centre:		
Task	Date achieved	Tutor signature
Task 1: Extract information from at least one type of graphical format		
Task 2: Communicate information using at least one type of graphical format		

Part 4: Information for learners

As you work through this Unit, your tutor will need to gather evidence that you are successfully completing the various tasks you do.

This can be done:

- ◆ by you completing an exercise
- ◆ by the tutor watching you work
- ◆ by the tutor asking you questions
- ◆ by you filling in a work book or diary

By the end of the Unit you must have shown that you can:

Get information from at least one of the following:

- ◆ a simple table containing two categories of information (eg a timetable; a distance table)
- ◆ a simple chart (eg bar or pie chart)
- ◆ a simple graph (eg a line graph with a simple scale)
- ◆ a simple diagram (eg a diagram of a 2-dimensional shape such as a floor plan; a 2-dimensional representation of a familiar 3-dimensional shape such as a cube; a simple map)

Give information through at least one of the following:

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The graphical format could be a:

- ◆ table
- ◆ chart
- ◆ graph
- ◆ diagram

Examples include:

- ◆ a bus timetable
- ◆ a pie chart
- ◆ a line graph
- ◆ a room layout plan

These are some of the things you might do to provide the evidence:

- ◆ working out best value from a simple mobile phone tariff table
- ◆ comparing the cost of 1st and 2nd class postage for a given package
- ◆ use a street map to find your nearest swimming pool
- ◆ completing a fuel consumption chart for a car
- ◆ provide information in a bar chart which shows the number of people buying brands of jeans

Learners with disabilities and/or additional support needs

The additional support needs of individual learners should be taken into account when planning learning experiences, selecting the most appropriate assessment activity and considering any reasonable steps which might be necessary to allow the learner to meet the assessment standard.

Further advice can be found in SQA's Assessment Arrangements' web pages (www.sqa.org.uk)

ADMINISTRATIVE INFORMATION

Core Skills

This Unit is part of a suite of three Units which when completed give automatic certification of the Core Skill of Numeracy at SCQF Level 3. The other Units in this suite are:

Using number: Calculation at SCQF Level 3

Using number: Measuring at SCQF Level 3

Credit Value

1 Credit(s) at (SQA Level 09) (6 SCQF credit points at SCQF Level 3)

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