



NUMERACY
Using Graphical Information
SCQF Level 3
10 Hour Unit (F3GG 09)

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. 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 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 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 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 or 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 two-dimensional shape such as a floor plan; a two-dimensional representation of a familiar three-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 or 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 two-dimensional shape such as a floor plan or 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.

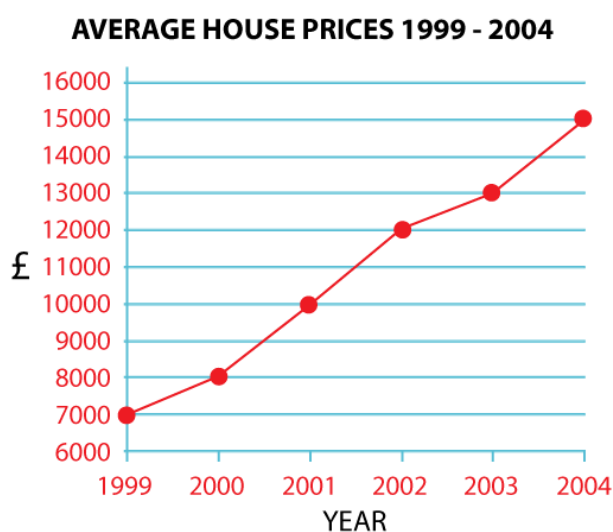
Tables

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

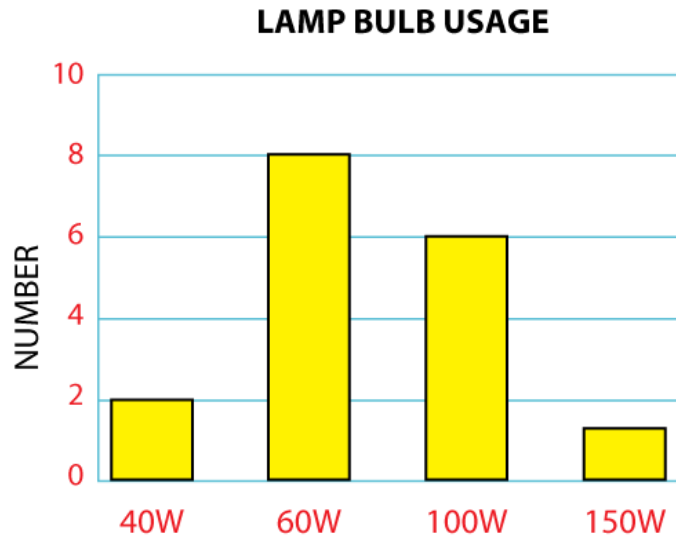
Graphs

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 varied from 1999 to 2004.

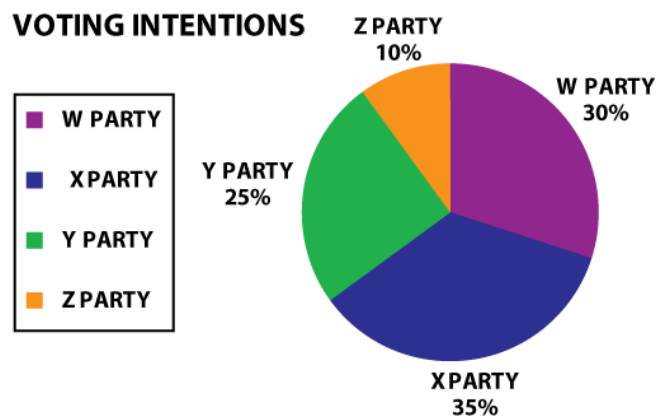


Charts

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

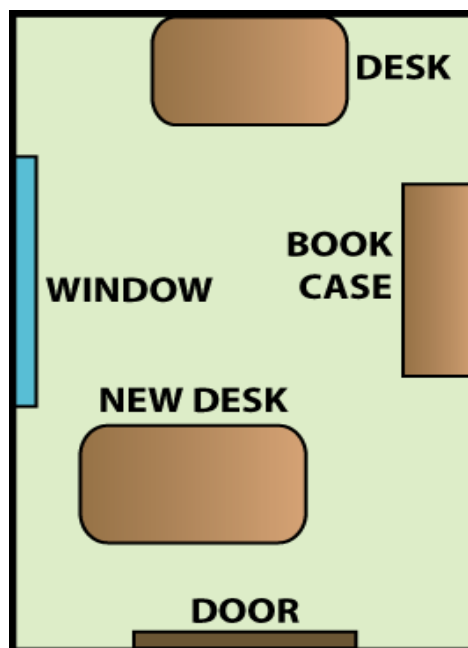


Pie charts are best used to show the proportions making up a whole. They are often based on information supplied in percentage form. The example shows the voting intentions of a group of people.



Diagrams

Diagrams are a method of presenting information that 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. Learners will need to know simple two-dimensional shapes. They will also need to know about two-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

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 the numeracy as part of a larger single activity. In this case you must keep separate records 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 that 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

It may be possible to create a single activity that would provide evidence for the whole Unit. If this is not possible, or if you do not think it would be appropriate for your learners, the Unit assessment could be split into smaller tasks. For example, an approach you might use is to have one activity covering the extraction of information from a graphical source and a second activity involving the communication of information to others using a graphical form.

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 two tasks to cover the assessment of this Unit. In the following pages examples are given of the type of graphical formats that could be used for extracting and communicating information as part of the tasks.

Exemplar assessment

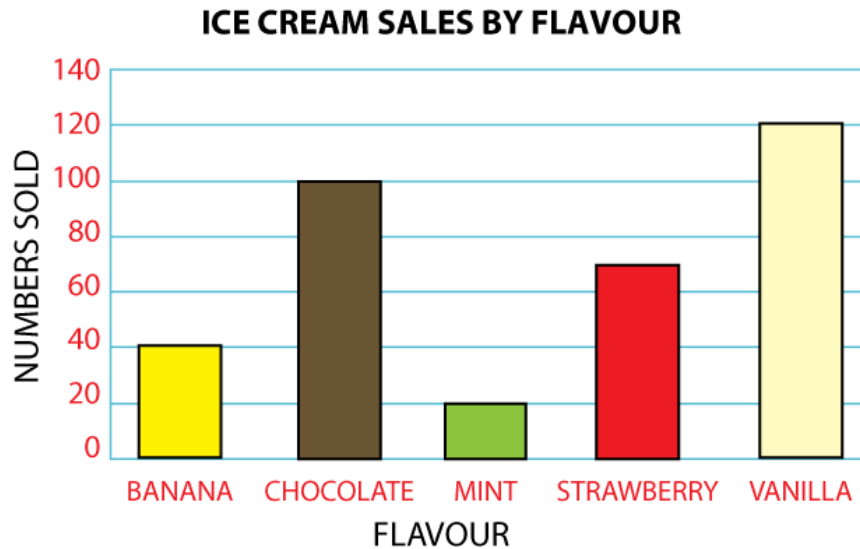
Task 1: Extract information from at least one of the types of graphical format

- 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

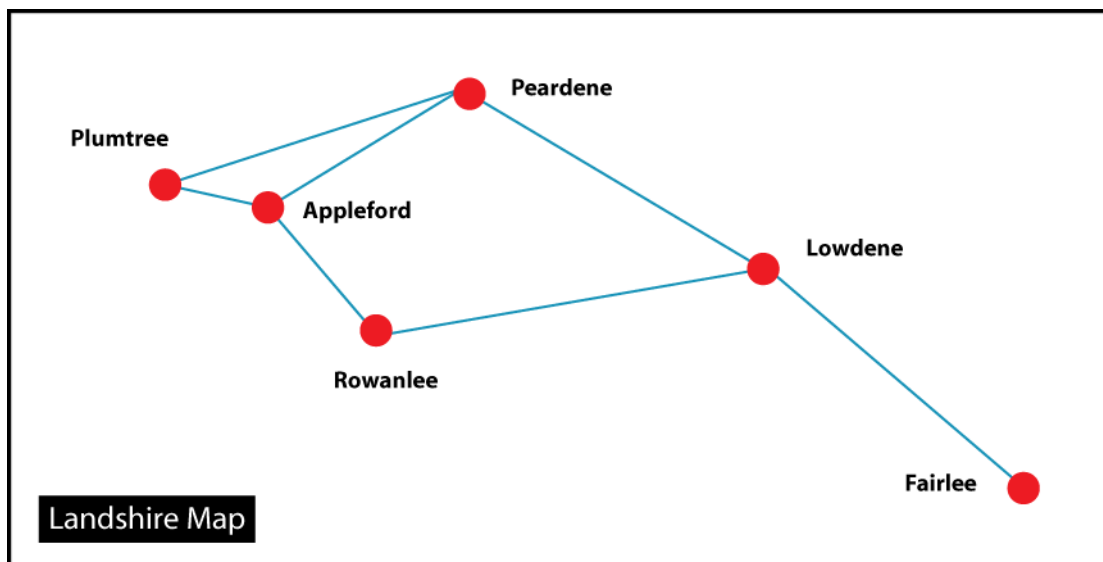
- a) How much does HandyPhone charge for a 10-minute call?
- b) Which operator offers the best value for a 10-minute call?

- 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.



- Which is the most popular flavour?
- Which is the least popular flavour?
- How many banana ice creams were sold?

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



- Which town is farthest away from Plumtree?
- 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 90 miles, on Wednesday 40 miles, on Thursday 80 miles, and on Friday 120 miles.

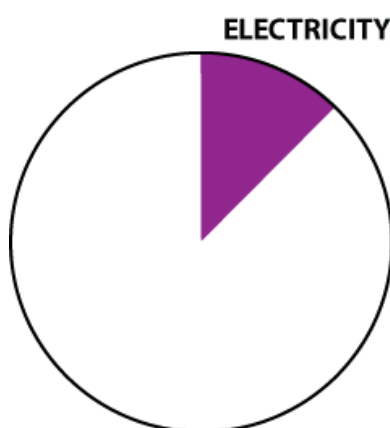
Complete the table to show the van driver's week.

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.

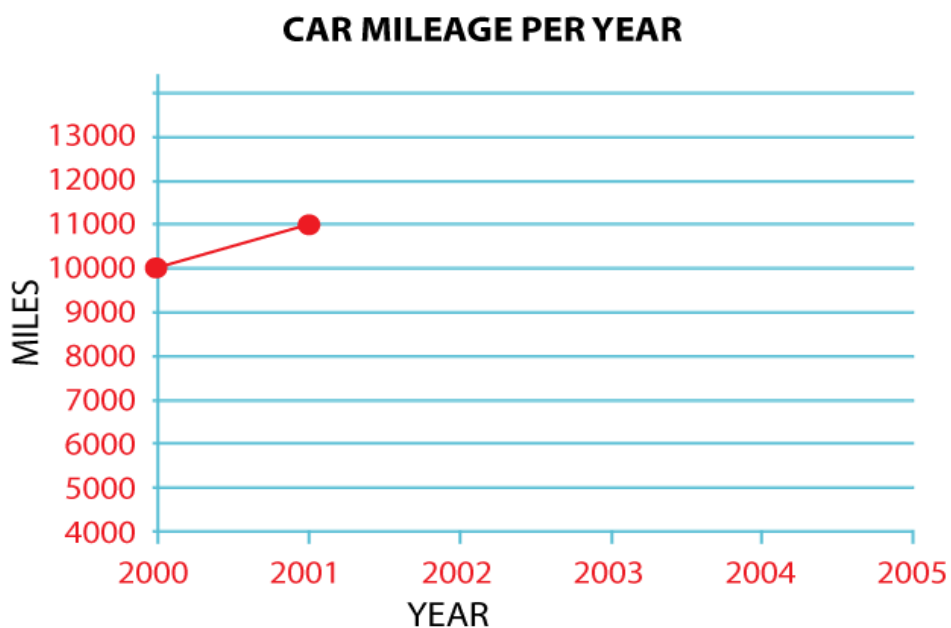
UTILITY COSTS



- 3 A motorist wonders how many miles have 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 2000 to 2005 to illustrate the mileage over the years.



Notes for assessment

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, where information is extracted from a graphical format.

1 Table — in this case a table. The correct answers are:

- a) £1.73 — the learner inspects the table to find HandyPhone and refers across to the cost category to find the answer.
- b) BigPhone — 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 that 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 that 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.

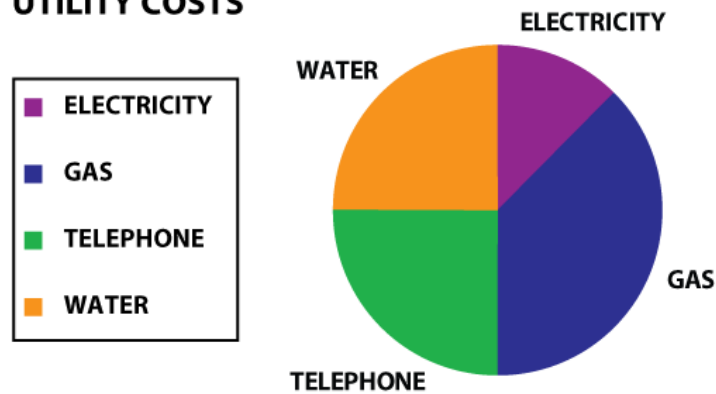
1 **Table** — the learner should complete it as shown:

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.

UTILITY COSTS



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 that can be easily marked out and drawn.

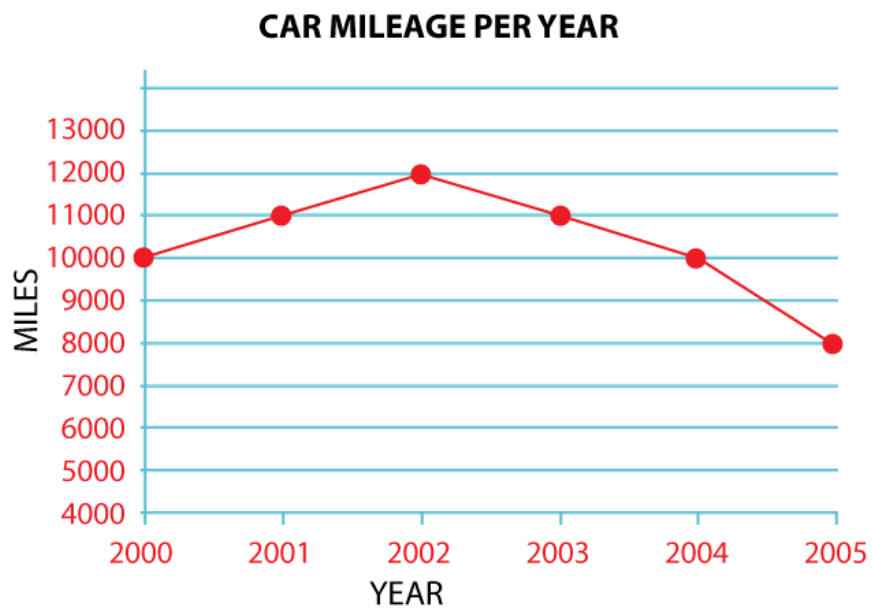
$$\text{Electricity} — 100/800 = 1/8$$

$$\text{Gas} — 300/800 = 3/8$$

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

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

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 that 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 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 requirement that is being assessed, eg bar chart.

Record sheet

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

1 a) How much does HandyPhone charge for a 10-minute call?

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

2 a) Which is the most popular flavour?

2 b) Which is 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

Learner:		
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

Learner:		
Learner 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		

ADMINISTRATIVE INFORMATION



Core Skills

This Unit is part of a suite of three Units that 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

1.5 SCQF credit points (0.25 SQA credits) at SCQF level 3

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