Teaching and Learning
Move On with your learners – numeracy

# Module 9
# Handling data

# Session plan

## Module 9: Handling data

Group: _____

Teacher: _____

Location: _____

**Aim**

- To explore the data handling skills needed for Level 2.

**Outcomes**

Participants will be able to:

- extract discrete and continuous data from tables, diagrams, charts and line graphs
- collect, organise and represent discrete and continuous data in tables, charts, diagrams and line graphs
- consider strategies for supporting learners when handling data.

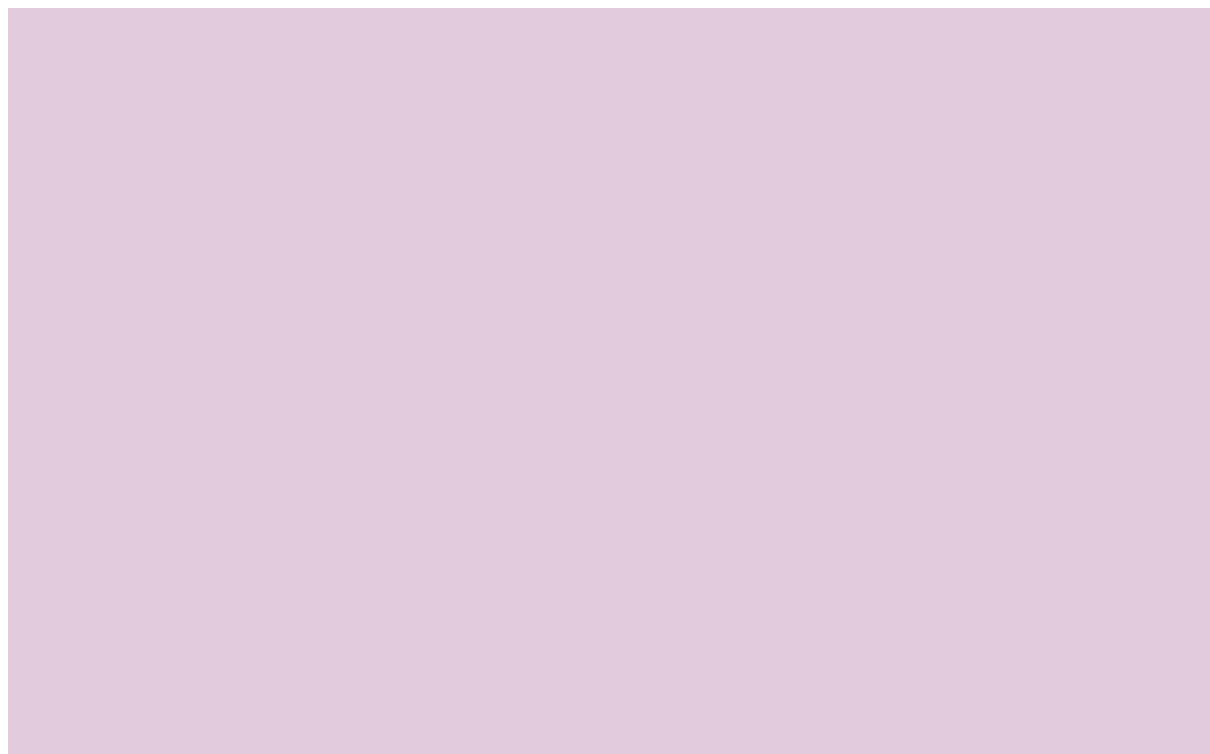| Activity and time | Teacher activity | Learner activity |
|---|---|---|
| **Introduction** 5 mins | - Introduce aims and objectives of session.<br>- Show **module 9 presentation slides 1–3**. | - Listen and respond. |
| **Mental maths: chocolate maths** 5 mins | - Read instructions to group. | - Participate in task. |
| **Hot Topics: review of basics and intro** 15 mins | - Use the **Hot Topics** resource to review 'basics' and 'intro' to tables, charts and graphs. | - Group discussion and feedback. |
| **History of the universe** 5 mins | - Use the **History of the universe** activity sheet to explore issues with interpreting and representing data. | - Listen and respond.<br>- Complete task in pairs. |
| **Two graphs** 20 mins | - Explain the **Two graphs** activity.<br>- Distribute the **Two graphs: possible solutions** handout.<br>- Take group feedback. | - Work in pairs.<br>- Feedback to group. |

| Activity and time | Teacher activity | Learner activity |
|---|---|---|
| **Representation of data**<br>5 mins | ● Use the **Lies and damned lies** handout to explore how the same data can be represented differently to suit different purposes. | ● Interpretation of data.<br>● Contribute to discussion. |
| **Interpretation of data**<br>25 mins | ● Explain task to participants (see Teacher's notes) and support paired work.<br>● Take group feedback. | ● Participate in paired activity and present results to another pair.<br>● Feedback to group. |
| **Break**<br>15 mins | | |
| **Skills for Life data**<br>20 mins | ● Distribute **Skills for Life data: Greater Merseyside** activity sheet and explain task.<br>● Manage group feedback of results. | ● Participate in task: paired work with individual product.<br>● Feedback to group. |
| **Hot Topics: testlets**<br>20 mins | ● Support group in answering **testlet** questions. | ● Answer the testlet questions. |
| **Putting learning into practice**<br>15 mins | ● Distribute resources that could be used by participants or learners within organisations to put skills and approaches into practice, including useful web sites and interactive software. | ● Read and respond.<br>● Engage in discussion. |
| **Professional development**<br>10 mins | ● Discuss *Skills for Life* professional development progression opportunities for participants.<br>● Distribute copies or extracts from **Skills for Life Teaching Qualifications Framework: a user's guide**.<br>● Distribute **Routemaps** handout.<br>● Invite questions. | ● Engage in discussion. |
| **Any questions**<br>10 mins | ● Encourage participants to ask any final questions on the curriculum skills covered or test preparation and experience. | ● Questioning.<br>● Contribute to discussion. |

| Activity and time | Teacher activity | Learner activity |
|---|---|---|
| **Summary**<br>10 mins | ● Revisit session aims and objectives, using **module 9 presentation slides 2 and 3**.<br>● Summarise tips for learners, using **module 9 presentation slide 4**.<br>● Encourage participants to prioritise final learning and preparation activity before the test.<br>● Hand out **Journal** sheet for module 9. | ● Listen and respond.<br>● Agree individual priorities. |

## Resources/aids

- Module 9 PowerPoint presentation/OHP slides
- Handouts: Two graphs – possible solutions; Lies and damned lies; Routemaps; Journal
- Activity sheets: Mental maths – chocolate maths; The history of the universe; Two graphs; *Skills for Life* data – Greater Merseyside
- Supplementary materials: *Skills for Life Teaching Qualifications Framework: a user's guide*; examples of real tables, charts and graphs from a range of sources; Routemaps
- Laptop and data projector with internet connection or CD drive
- Hot Topics, on CD-ROM or via internet connection to www.move-on.org.uk.

## Assessment evaluation

## Individual learning planning

| Learner | Skills | Activity/ Resources | Evaluation (where next?) |
|---------|--------|---------------------|--------------------------|
|         |        |                     |                          |
|         |        |                     |                          |
|         |        |                     |                          |
|         |        |                     |                          |
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|         |        |                     |                          |

# Teacher's notes

## Module 9: Handling data

## Intoduction

Introduce the aims and outcomes of the session, using **slides 2 and 3**. Ask for participants' feedback on their experience of a full practice test under timed conditions. Explore any issues arising from the independent tasks.

## Mental maths: chocolate maths

Explain that this activity was discovered in a chain e-mail, and that it is worth keeping an eye out for 'junk' e-mails containing maths tricks. They all tend to date quite quickly, but their advantage is that they are therefore topical and current.

## Hot Topics: review of basics and introduction

Use the **Hot Topics** resources projected onto a screen to review the independent task set at the end of last session. Concentrate on any areas of difficulty and confusion. Focus on pie charts, ensuring that the participants understand the relationship between degrees in the circle of the 'pie' and fractions. Use some of the problems in the 'Try it out' section to assess understanding.

## The history of the universe

Distribute the **History of the universe** activity sheet and use stimulus material for a discussion on the problems of interpreting data, and the advantages of visual representation. How does the way the information is presented in the *Times Educational Supplement* article help give the reader a 'feel' for the time scale? What would further support our understanding of this? Ask participants to work in pairs and sketch out a time line to determine whether we should be concerned about our sun becoming a red giant in the near future, or take directions from the group and sketch out on the whiteboard or flipchart. Approximately how many millions of years away is '1 April next year'?

## Two graphs

Distribute the **Two graphs** activity sheet. Ask participants to work in pairs, and each choose one of the graphs. Suggest that they spend some time thinking of a possible scenario to fit the graph, and then explain the scenario to their partner. Take feedback

from each pair, and encourage the other participants to challenge the 'solutions' if they do not fit the graph. Do not allow any 'solutions' that do not represent a possible interpretation of the graph. At the end, distribute the **Two graphs: possible solutions** handout and discuss any differences in interpretation.

## Representation of data

Use the **Lies and damned lies** handout to prompt discussion on the how the same data can be represented in different ways to suit different purposes. Explore the potential differences in motivation that would inform the choice of how to present the data. Who might choose to represent the data by using the scale of the first graph, and who might choose to use the second?

## Interpretation of data

Ask participants to work first in pairs, and select an example of a table, bar chart, pie chart or line graph from the examples they have brought in or have been provided with. These should come from a range of readily available sources: newspapers, magazines, web sites etc. Ask them to extract the key points of information, and evaluate the resource's effectiveness in presenting information in a visual format. Now ask them to present the same information in a different format: bar chart, line graph, pie chart or table. Has this made the information easier or harder to interpret? Easier or harder to represent effectively or accurately? Would the new format appeal to a particular audience more than the original, or less? Why? Ask each pair to present both versions of the information represented to another pair, explaining what the key messages are in terms of the data, and conclusions they have drawn about the advantages and disadvantages (if any) of both formats. Take group feedback and pull out key points.

## Skills for Life data

These tables were extracted from the readwriteplus web site (www.dfes.gov.uk/readwriteplus_skillsforlifesurvey). You could adapt the handout to include data from your region (or borough or ward) to work with for this activity. Support the participants' decisions about which figures to use and how to best represent the information presented in the tables by questioning. Participants could be encouraged to work in pairs or small groups whilst interpreting the information and deciding how best to present it, but produce individual products to ensure they all have experience of representing statistical information.

## Hot Topics: testlets

Use the **testlets** section of Hot Topics for practice of test-type questions, either to the group by projecting on the screen, or individually via PCs.

## Putting learning into practice

Distribute resources that could be used by participants or their learners to put the skills and approaches developed and experienced in the course into practice, including useful web sites and resources. Draw attention to the 'Linking resources to delivery' resource on the Move On web site by displaying it on screen. Demonstrate how the resources referred to are free and mapped against the skills of the relevant curriculum from Entry 3 to Level 2, and emphasise how it could prove valuable in saving time when identifying appropriate resources for their learners. Include useful web sites, both educational and non-educational, when signposting participants to teaching resources, and remind them of the use of web sites as source material for both the taught course content and their independent learning.

Refer to the variety of resources and strategies that have been used during this programme, and ask participants to refer to their journals to remind themselves of instances where they have used the approaches, resources or strategies with their learners since the beginning of the programme. Take group feedback on their experience of strategies and resources discovered during the course that they have or will find useful when supporting their learners.

## Professional development

Discuss progression opportunities for participants, with particular focus on the Level 3 and 4 Professional *Skills for Life* Qualifications, using the *Skills for Life Teaching Qualifications Framework: a user's guide*, and any of the Routemap resources you have ordered.

## Any questions

Take any final questions on any remaining issues or particular concerns, either on the curriculum skills covered or test technique and preparation. Remind participants of the 'Pointers to test success' section of the Learner Route on the Move On web site, and use the opportunity to build confidence and allay fears.

## Summary

Ask participants to identify which activities they are going to prioritise in order to prepare for the test before the next session. Encourage them to be focused and realistic!

# Module 9 PowerPoint presentation



**The National Certificate in Adult Numeracy**

Level 2 Skills for Life Support Strategies

Module 9: Handling data

department for
**education and skills**
creating opportunity, releasing potential, achieving excellence

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## Aim

→ To explore the handling data skills needed for Level 2.

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## Outcomes

Participants will have:

→ reviewed discrete and continuous data, and be able to analyse and extract information from tables, diagrams, charts and line graphs

→ revised approaches to test questions

→ reflected on their own learning and evaluated their learning experience.

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## Handling data: tips for learners

→ Maintain a balance against the aspects of data handling.

→ You may need to give more time to interpreting and analysing data and less to collecting and presenting it.

→ Use data, graphs and charts in newspapers, magazines and the net.

→ Allow plenty of time for discussion.

→ Give learners regular practice in reading scales of increasing difficulty appropriate to their level.

4

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## Move On contacts



**Move On** web site
www.move-on.org.uk

**Move On** e-mail
move-on@ctad.co.uk

Tel. (01223) 470480

department for
**education and skills**
creating opportunity, releasing potential, achieving excellence

TRIBAL  CTAD

# Activity: Mental maths – chocolate maths

This is an example of a 'chain' e-mail that came in useful as a fun mental maths activity. It worked in 2006, but may need some tweaking to make it work in subsequent years. However, you will probably have received other chain e-mails by then which will work just as well.

First of all, pick the number of times a week that you would like to have chocolate (more than once but less than 10).

Multiply this number by 2 (just to be bold!)

Add 5

Multiply it by 50

If you've already had your birthday this year add 1756; if you haven't, add 1,755.

Now subtract the four digit year that you were born.

You should have a three digit number.

The first digit of this was your original number, i.e. how many times you want to have chocolate each week.

The next two numbers are . . .

Your age!

# Activity: The history of the universe

If the whole history of the universe could be compressed into the space of one earth year, with the Big Bang occurring on 1 January and the start of the second millennium AD at midnight on 31 December, the first galaxies would have begun to form on 2 January.

It was a long wait before the birth of our sun, on 10 September, and our own planet, the Earth, on 13 September. Life appeared around 15 October.

The dinosaurs lived on 24 December, but it was not until 9 p.m. on 31 December that the first recognisable human beings evolved. At ten seconds to midnight, the Egyptians built the pyramids.

On this scale, the sun will become a red giant rendering Earth uninhabitable, by around 1 April next year.

*Times Educational Supplement*, 13 August 1999

Is the information in this paragraph relatively easy to interpret?
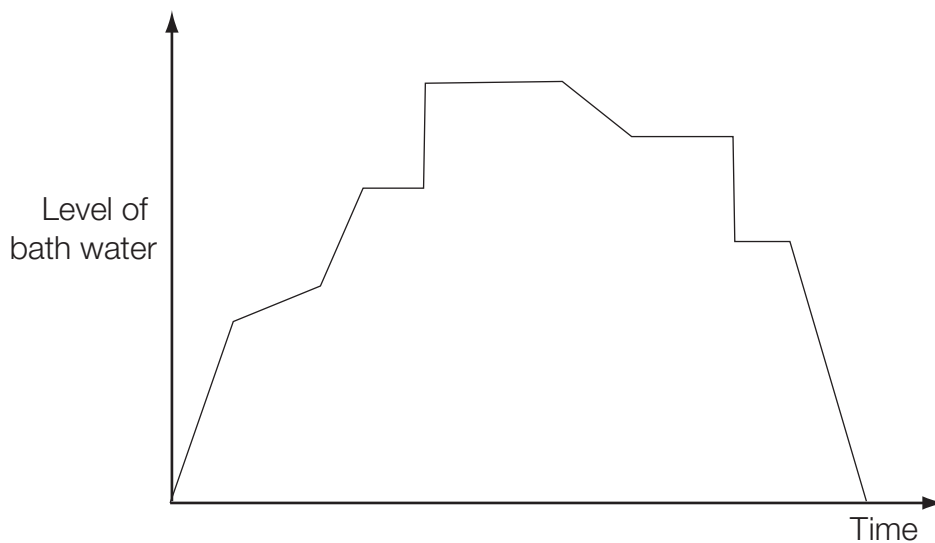
What might make it easier to interpret at a glance?

Should we be worried? Sketch out a visual representation of this information to find out.

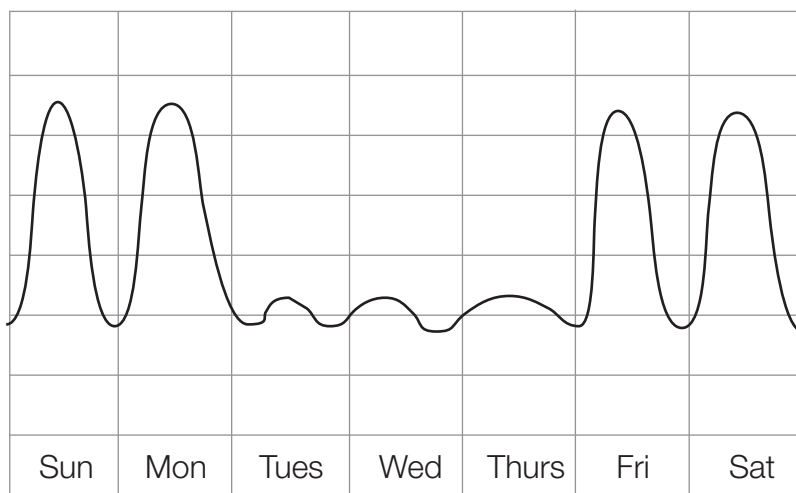*Based on an activity from the Adult Numeracy Core Curriculum training materials.*

# Activity: Two graphs

Work in pairs. Each choose one graph and decide on a scenario to fit the graph. Tell your partner your scenario, justifying it as you go.
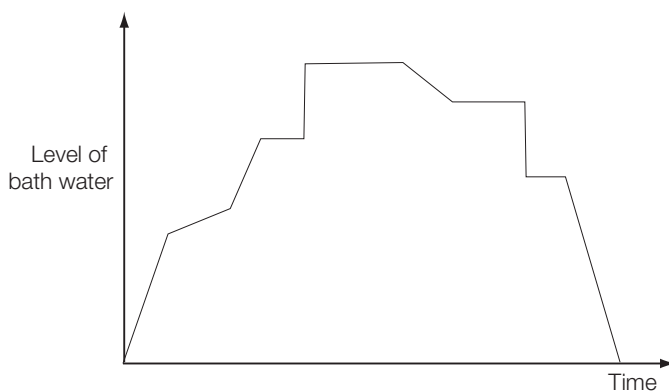
## Bath time



## More room mid-week

# Handout: Two graphs – possible solutions

The solutions to explain the scenarios described by the graphs are only limited by your imagination. Here are two possible solutions:
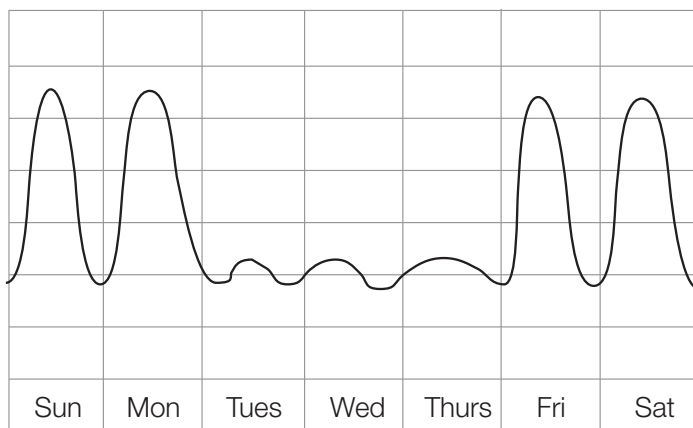
## The scenario at bath time



This graph represents the water level in a bath. At first both taps are on and the bath is filling quickly. For a while the cold tap is turned off; the water gets too hot and so the cold tap is turned on again.

A short time is taken to remove clothes. The person steps into the bath and lies down. A period of relaxation follows.

The person sits up, gradually lowering the water level as they do, and stays sitting for a while. The phone rings. They get up suddenly and step out, leaving the water level lower than when they got in because some spills out as they get out. After the phone call, the water is let out.

## More room mid-week



This graph represents the number of living creatures in the animal section of a park.

It has a steady stream of daily visitors, but more from Friday to Monday because it is the weekend.
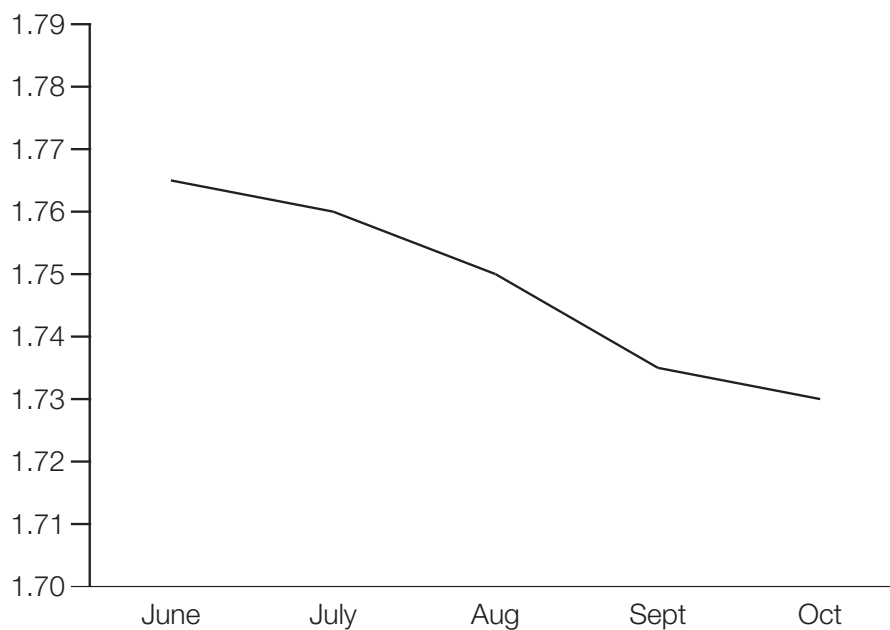
It is never empty because there are always animals there and staff to look after them.

# Handout: Lies and damned lies

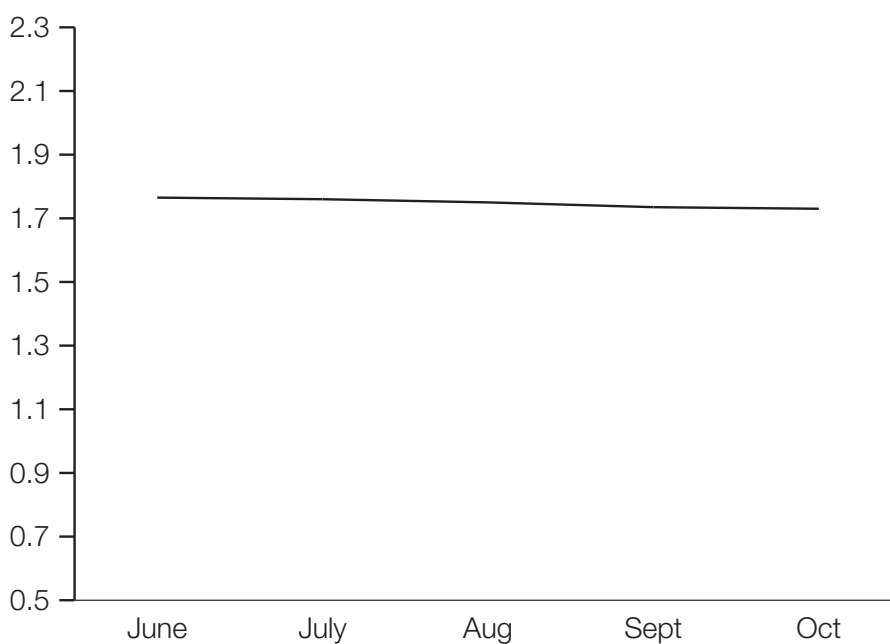Graphs can be made to show information in a different light by changing the scale.

For example, if the government wants to show that unemployment is falling rapidly, it might use the first graph. The second graph uses the same figures, but by using a different scale, presents them less dramatically.

*Male unemployment from June to Oct (millions)*



*Male unemployment from June to Oct (millions)*

# Activity: Skills for Life data – Greater Merseyside

(Statistics available from www.dfes.gov.uk/readwriteplus_skillsforlifesurvey.)

**Literacy Skills of Greater Merseyside population by borough (16- to 65-year-olds)**

| Greater Merseyside Borough | Entry Level: Number | Entry Level: Proportion | Level 1: Number | Level 1: Proportion | Level 2: Number | Level 2: Proportion |
|---|---|---|---|---|---|---|
| Knowsley | 17,800 | 19% | 48,780 | 52% | 26,740 | 29% |
| Liverpool | 37,120 | 14% | 127,800 | 47% | 109,200 | 40% |
| St Helens | 19,870 | 18% | 56,200 | 50% | 36,280 | 32% |
| Sefton | 23,870 | 14% | 86,730 | 51% | 60,310 | 35% |
| Wirral | 28,090 | 15% | 95,360 | 50% | 66,770 | 35% |
| Halton | 17,520 | 23% | 34,060 | 45% | 24,700 | 32% |

**Numeracy Skills of Greater Merseyside population by borough (16- to 65-year-olds)**

| Greater Merseyside Borough | Entry Level: Number | Entry Level: Proportion | Level 1: Number | Level 1: Proportion | Level 2: Number | Level 2: Proportion |
|---|---|---|---|---|---|---|
| Knowsley | 66,520 | 71% | 18,430 | 20% | 8,365 | 9% |
| Liverpool | 164,700 | 60% | 77,600 | 28% | 31,860 | 12% |
| St Helens | 68,730 | 61% | 28,760 | 26% | 14,860 | 13% |
| Sefton | 94,240 | 55% | 49,120 | 29% | 27,550 | 16% |
| Wirral | 101,000 | 53% | 57,470 | 30% | 31,710 | 17% |
| Halton | 53,090 | 70% | 15,000 | 20% | 8,195 | 11% |

Study the two tables above, which show the numbers and proportion of the adult population of the six boroughs of Greater Merseyside with skills in literacy and numeracy at Entry Level and below, Level 1, and Level 2 and above.

As a training provider, you offer E2E training programmes across all six boroughs. From which borough would you expect to have the most referrals?

## Task

Present the information above as two bar charts, one for literacy and one for numeracy. Choose a suitable scale, give each a title and label the vertical and horizontal axes. Decide on whether you are going to illustrate the data by using the percentage figures or the population numbers. Each 'bar' should represent a borough, and include data for all three levels (Entry, Level 1 and Level 2). (Hint: You could use colour coding or shading.) Include a key if appropriate.

# Handout: Routemaps

Routemaps to the new qualifications are available for existing *Skills for Life* staff, new specialist *Skills for Life* teachers and others supporting *Skills for Life* learning. These can be ordered from DfES Publications (tel. 0845 60 222 60).

● *Skills for Life: adult literacy, language and numeracy – new specialist Skills for Life teachers*. This booklet is for those with no previous teaching experience (new entrants to the teaching profession) to navigate their way through the new range of qualifications, in order to work with adults in literacy, numeracy or ESOL programmes (Order ref: ROUTEMAP-NT).

● *Skills for Life: adult literacy, language and numeracy – supporting Skills for Life learning*. This booklet is for teachers of other subjects and those in the learning support role (Order ref: ROUTEMAP-SL).

● *Skills for Life: adult literacy, language and numeracy – existing Skills for Life teachers*. This booklet is for people who are existing *Skills for Life* teachers (Order ref: ROUTEMAP-ET).

# Journal

## Module 9: Handling data

What have you learnt from this module?

How will you apply skills/strategies learnt with learners within your organisation?