Travelling in the UK - Functional Maths practice

You will need: pen, pencil, ruler, graph or squared paper, protractor and a set of compasses (or a computer with a graphics package). You can use a calculator. You must show all your working out.

A survey was taken at *Northarbour to find out how far staff travel to work and how they get there.

<table>
<thead>
<tr>
<th>Staff Initial</th>
<th>Distance travelled</th>
<th>Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>NG</td>
<td>6.5 miles</td>
<td>Car</td>
</tr>
<tr>
<td>LT</td>
<td>3 miles</td>
<td>Bus</td>
</tr>
<tr>
<td>FH</td>
<td>15 miles</td>
<td>Car</td>
</tr>
<tr>
<td>JC</td>
<td>2 miles</td>
<td>Bicycle</td>
</tr>
<tr>
<td>CB</td>
<td>8 miles</td>
<td>Motorbike</td>
</tr>
<tr>
<td>NE</td>
<td>1.5 miles</td>
<td>Free Bus</td>
</tr>
<tr>
<td>TH</td>
<td>8.5 miles</td>
<td>Train</td>
</tr>
<tr>
<td>CR</td>
<td>3.2 miles</td>
<td>Bicycle</td>
</tr>
<tr>
<td>RD</td>
<td>2.5 miles</td>
<td>Free Bus</td>
</tr>
<tr>
<td>BS</td>
<td>10 miles</td>
<td>Car</td>
</tr>
<tr>
<td>KL</td>
<td>7.5 miles</td>
<td>Bus</td>
</tr>
<tr>
<td>LC</td>
<td>12 miles</td>
<td>Motorbike</td>
</tr>
<tr>
<td>JS</td>
<td>6 miles</td>
<td>Car</td>
</tr>
<tr>
<td>PW</td>
<td>1.5 miles</td>
<td>Walk</td>
</tr>
</tbody>
</table>

Use the information above to create a tally chart for mode of transport. Do this neatly on squared paper; it may be used for a display!

Use the information in your tally chart to draw a bar chart below it. Remember to label it correctly!

Below your transport chart you need to write the most common form of transport. Comment on this.

EXTENSION TASK

Now draw a pie chart showing the other information from the data chart – the distance travelled. Discuss your ideas for grouping the data with your lecturer before you start.

Below your distance chart write the mean distance travelled to work (to 1 decimal place) and the range of distances. Comment on this.

*Northarbour Centre is part of Highbury College, Portsmouth.
Travelling in the UK – Functional Maths practice
Using a distance chart

UK Towns and Cities Distance Chart
Distances are shown in miles.

Covers many aspects of E3-L2 Adult Numeracy and Functional Mathematics (measure and data). For related resources and further curriculum links visit the resource description page at www.skillsworkshop.org
Travelling in the UK - Functional Maths practice

Name ____________________ Date ________

Use the distance chart to answer the following questions.

1. What is the distance between Stratford and London?
2. How far is it from Glasgow to Cambridge?
3. What is the distance from Manchester to Holyhead?
4. Which two cities are closest together?
5. Which two cities are furthest apart?
6. If I travel from Cardiff to Birmingham, then on to Oxford, how far do I travel?

CHARITY BIKE RIDE

Two friends, Tori and Jack have decided to each complete a charity bike ride. Tori has chosen the “Northern Challenge” and Jack the “England to Wales Velo-Trial”.

NORTHERN CHALLENGE

Charity Bike Ride
Starting on the 15th May in Aberdeen.
Leg 1 – Aberdeen to Edinburgh
Leg 2 – Edinburgh to Newcastle
Leg 3 – Newcastle to Liverpool

ENGLAND TO WALES VELO-TRIAL

Bike ride for charity.
Starts on the 20th May in London
Leg 1 – London to Cambridge
Leg 2 – Cambridge to Birmingham
Leg 3 – Birmingham to Bristol
Leg 4 – Bristol to Cardiff

Use the distance chart to work out how far each leg is, and the total distance of each ride.

Jack has been sponsored 15p per mile by 8 people, and Tori 10p per mile by 12 people.
How much money does each person raise?
Teaching Notes

I created this resource as practice in data handling for a L1 Functional Maths group.

The students are 16-18, and have a limited knowledge of Geography, so I included an outline map of the UK and got them to use a road map to find and mark the cities and towns that are on the distance chart. This made the lesson have a more ‘useful feel’ as they often question how lessons fit in with their own lives so hopefully it improved their knowledge of their own country.

We also looked at the road map and the distance chart in there and discussed where they live/have been/places of interest/distances across the country etc.

Nikki Gilbey

ANSWERS

Distance Chart
1. 95 miles
2. 349 miles
3. 125 miles
4. Birmingham and Stratford (24 miles)
5. Penzance and Aberdeen (690 miles)
6. 107 + 63 = 170 miles

Jack raises 291 x .15 = £43.65 x 8 = £349.20

Tori raises 406 x .10 = £40.60 x 12 = £487.20

Northern Challenge
Aberdeen – Edinburgh 127 miles
Edinburgh – Newcastle 109 miles
Newcastle – Liverpool 170 miles
TOTAL – 406 miles

England to Wales Velo Trial
London – Cambridge 60 miles
Cambridge – Birmingham 101 miles
Birmingham – Bristol 85 miles
Bristol to Cardiff 45 miles
TOTAL – 291 miles

Comments can be any sensible statement or comparison. E.g. comparing the use of cars / bikes / buses at Northarbour to the student’s own college; suggesting that modes of transport will depend on the situation of a college, how good local public transport is; that the survey might only be quite a small sample of staff; that use of bikes / motorbikes / walking might increase in the summer, etc.

Creation of a pie chart will be quite challenging as student will have to group times into categories first . E.g. 1-5 miles, 6-10 miles, 11-15 miles (other groups are acceptable).

Adult Numeracy

This resource covers many aspects of the adult numeracy curriculum (whole numbers, distance, data handling, etc.).

For related resources, teaching ideas, and further curriculum links visit the resource description page at www.skillsworkshop.org
Mobile Phone Functional Maths

Teaching notes | Answers | Functional Maths mapping

Functional Mathematics

This resource is ideal for underpinning many Functional Maths coverage and range statements – at Entry 3, Level 1 and Level 2 (see highlighted areas of the table below). However, in Functional Maths exams it is the process skills that are assessed; these are key to successful Functional Maths teaching and learning and must always be developed and stressed during teaching (see page 6).

### Coverage and Range statements (indicative only)

Coverage and range statements provide an indication of the type of mathematical content candidates are expected to apply in functional contexts. Relevant content can also be drawn from equivalent National Curriculum levels & Adult Numeracy standards.

#### Level 2

- understand and use positive and negative numbers of any size in practical contexts
- carry out calculations with numbers of any size in practical contexts, to a given number of decimal places
- understand, use and calculate ratio and proportion, including problems involving scale
- understand and use equivalences between fractions, decimals and percentages
- understand and use simple formulae and equations involving one or two operations
- recognise and use 2D representations of 3D objects
- find area, perimeter and volume of common shapes
- use, convert and calculate using metric and, where appropriate, imperial measures
- collect and represent discrete and continuous data, using information and communication technology (ICT) where appropriate
- use and interpret statistical measures, tables and diagrams, for discrete and continuous data, using ICT where appropriate
- use statistical methods to investigate situations
- use probability to assess the likelihood of an outcome

#### Level 1

- understand and use whole numbers and understand negative numbers in practical contexts
- add, subtract, multiply and divide whole numbers using a range of strategies
- understand and use equivalences between common fractions, decimals and percentages
- add and subtract decimals up to two decimal places
- solve simple problems involving ratio, where one number is a multiple of the other
- use simple formulae expressed in words for one- or two-step operations
- use data to assess the likelihood of an outcome
- solve problems requiring calculation, with common measures, including money, time, length, weight, capacity & temperature
- convert units of measure in the same system
- work out areas and perimeters in practical situations
- construct geometric diagrams, models and shapes
- extract and interpret information from tables, diagrams, charts and graphs
- collect and record discrete data and organise and represent information in different ways
- find mean and range

#### Entry 3

- **add and subtract using three-digit numbers**
- solve practical problems involving multiplication and division by 2, 3, 4, 5 and 10
- round to the nearest 10 or 100
- understand and use simple fractions
- understand, estimate, measure and compare length, capacity, weight and temperature
- understand decimals to two decimal places in practical contexts
- recognise and describe number patterns
- complete simple calculations involving money and measures
- recognise and name simple 2D and 3D shapes and their properties
- use metric units in everyday situations
- extract, use and compare information from lists, tables, simple charts and simple graphs

### References:

Ofqual (2009), *Functional Skills criteria for Mathematics: Entry 1, Entry 2, Entry 3, level 1 and level 2.*


Kindly contributed by Nikki Gilbey, Highbury College. Search for Nikki on skillsworkshop.org

March 2011. Covers many aspects of E3-L2 Adult Numeracy and Functional Mathematics (number, measure and data). For related resources and further curriculum links visit the resource description page at [www.skillsworkshop.org](http://www.skillsworkshop.org)
## Mobile Phone Functional Maths

### Teaching notes | Answers | Functional Maths mapping

<table>
<thead>
<tr>
<th>Process Skills (all levels)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Representing</strong> – selecting the mathematics and information to model a situation</td>
<td><strong>Analysing</strong> – processing and using mathematics</td>
</tr>
</tbody>
</table>

#### Skill Standards (Level 2)
- understand routine and non-routine problems in familiar and unfamiliar contexts and situations
- identify the situation or problems and identify the mathematical methods needed to solve them
- choose from a range of mathematics to find solutions

#### Skill Standards (Level 1)
- understand practical problems in familiar and unfamiliar contexts and situations, some of which are non-routine
- identify and obtain necessary information to tackle the problem
- select mathematics in an organised way to find solutions

#### Skill Standards (Entry 3)
- understand practical problems in familiar contexts and situations
- begin to develop own strategies for solving simple problems
- select mathematics to obtain answers to simple given practical problems that are clear and routine

### Ideas for developing maths process skills
**R** = representing, **A** = analysing, **I** = interpreting

**Encourage students to:**
- highlight information they need, cross out unneeded information **R**
- show all their working out (note that calculators are permitted at all levels of FM assessment but learners should get into the habit of recording their calculations) **R**
- check all their calculations or procedures and show proof that they have done so **RA**
- draw conclusions **I**
- discuss and justify their choice of method and their answers **RAI**
- explain their answers and conclusions to others – verbally and in writing **I**
- investigate other options / situations (e.g. some question topics could be researched on the web) **RAI**
- create new questions about given information and try them out on other students **RAI**
- mark each other’s work **RAI**

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