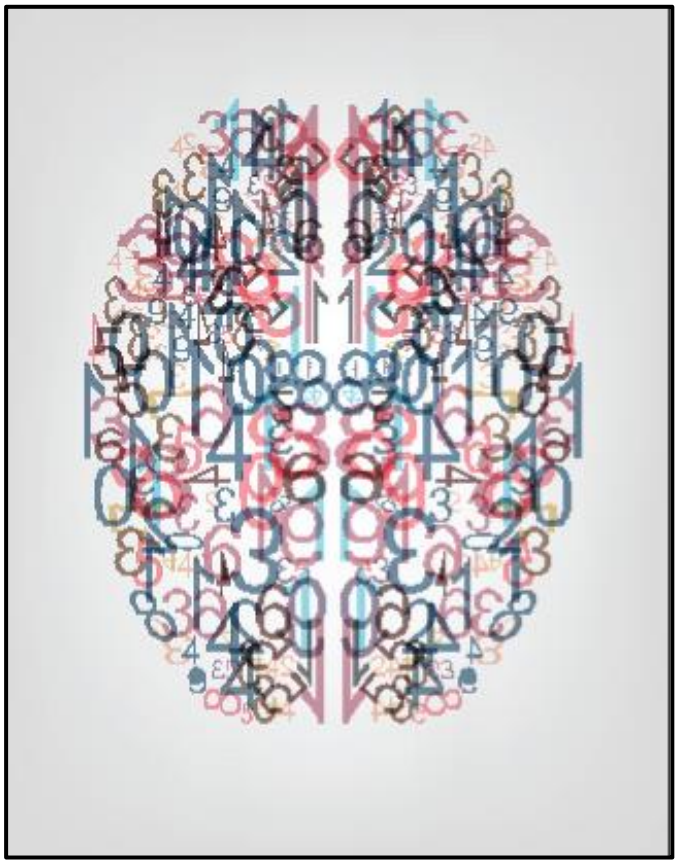
Additional Support Notes

# Numeracy (National 3) Unit
# Additional learning and teaching Support Notes





Please refer to the note of changes at the end of this document for details of changes from previous version (where applicable).

April 2013, draft version 1.0

# Contents

# Introduction

These support notes are not mandatory. They provide additional advice and guidance on approaches to learning and teaching programmes in the National Numeracy Unit at SCQF level 3.

These are intended for teachers and lecturers and should be read in conjunction with the:

- Numeracy (National 3) Unit Specification
- Numeracy (National 3) Unit Support Notes

And where the National Numeracy Unit is part of the National 3 Course in Lifeskills Mathematics:

- National 3 Lifeskills Mathematics Course Specification
- National 3 Lifeskills Mathematics Course Support Notes

# Additional support

In this package, the aim is to offer additional support to teacher/lecturers by clarifying what we understand to be usual practice in aspects of learning and teaching. This is not designed to be something extra for learners to undertake.

This package aims to enhance the support for Numeracy (National 3) Unit in its coverage of Core Skills Numeracy at SCQF Level 3. The learning and teaching approaches mentioned here are not exhaustive and are for guidance only.

The skills that are being clarified and exemplified are:

- calculating ratios
- presenting information in appropriate graphical forms

At this level, learners may need some support and prompting through the use of questions.

**Responsibility of all**
All practitioners have responsibility for the development of learners' numeracy. How this takes place will vary depending on the context or subject area. All Centres should have strategies in place to ensure there is a shared understanding of professional roles, how learners progress in numeracy and of sound approaches to numeracy teaching and learning.

# Approaches to learning and teaching using graphical information

For each skill, three learning and teaching ideas will be exemplified in the following ways:

- standalone
- from across learning
- in a vocational context

# Skill 1: Calculating Ratios

In Numeracy 3, learners should be able to understand and use the notation for simple ratios such as 1:2 or 4:1. This could apply to problems in which learners have to carry out a simple multiplication or division.

We shall look at three learning and teaching ideas on ratio. The first occurs as a freestanding situation, the second comes from across learning, and the third occurs in a vocational context.

# Learning context: Standalone

In this example, we consider the type of thing you may already be doing in class with regard to ratio. For example, you could decide to investigate the ratio of right-handed learners to left-handed learners in your class. As a starting point, the example below could be considered.

**EXAMPLE**
The ratio of left-handed people to right-handed people in the population has been found to be approximately 1:9.

In a group of learners, three are left-handed. How many right-handed learners would you expect to find in the group?

NOTE TO TEACHER/LECTURER: The ratio in your class could be calculated and compared with the population as a whole.

# Learning context: Across-learning situation

Various options present themselves here. For example, from Art you could consider mixing paint, eg mix blue and yellow paint in the ratio 2:1 to make dark green paint. In Geography, consideration could be given to simple scales in maps such as 1:100. These and other interdisciplinary ideas such as mixing ingredients in a recipe could form the basis for projects on ratio. The example below is based on a simple idea from food science — dilution of juice.

**EXAMPLE**
On a bottle of diluting orange juice, the instructions state that the juice should be mixed with water in the ratio 1:4. How much juice should be mixed with 800 millilitres of water?

# Learning context: Vocational context

It would be very useful to explain to learners that, for legal reasons, the use of ratios is needed in many jobs. Discussion could take place on the teacher/lecturer to learner ratios in primary and secondary schools and in colleges. The legally required ratios for school/college outings could be looked into. The legal requirements for ratios in nursery school depend on the age of the children and this should provide another interesting source of material.

**EXAMPLE**
In a nursery school, the ratio of teacher to children for 3 – 5 year olds must be at least 1:8. The school has three teachers available. How many children can be cared for in the 3 – 5 year old age group?

NOTE TO TEACHER/LECTURER: This could be extended to investigate what happens when there are, say, 25 children.

# Skill 2: Presenting information in appropriate graphical forms

In Numeracy (National 3) Unit, learners should be able to communicate information in at least one of the following: simple tables, graphs, charts or diagrams.

In this case, the tables, graphs, charts or diagrams should be selected and designed for the learner to complete. In the case of a graph, the scale should be given.

Communication in simple diagrams should only involve two-dimensional shapes. The graphical form used to communicate information should be specified for the learner.

Three learning and teaching ideas related to graphs are given below, one free standing, one from across learning, and one in a vocational context.

Within these three examples, learners will be asked to complete a bar graph and a line graph. Two of the examples will have additional parts in which other skills in numeracy related to the graphs and tables can be shown. These include the need to check answers involving both counting and adding.

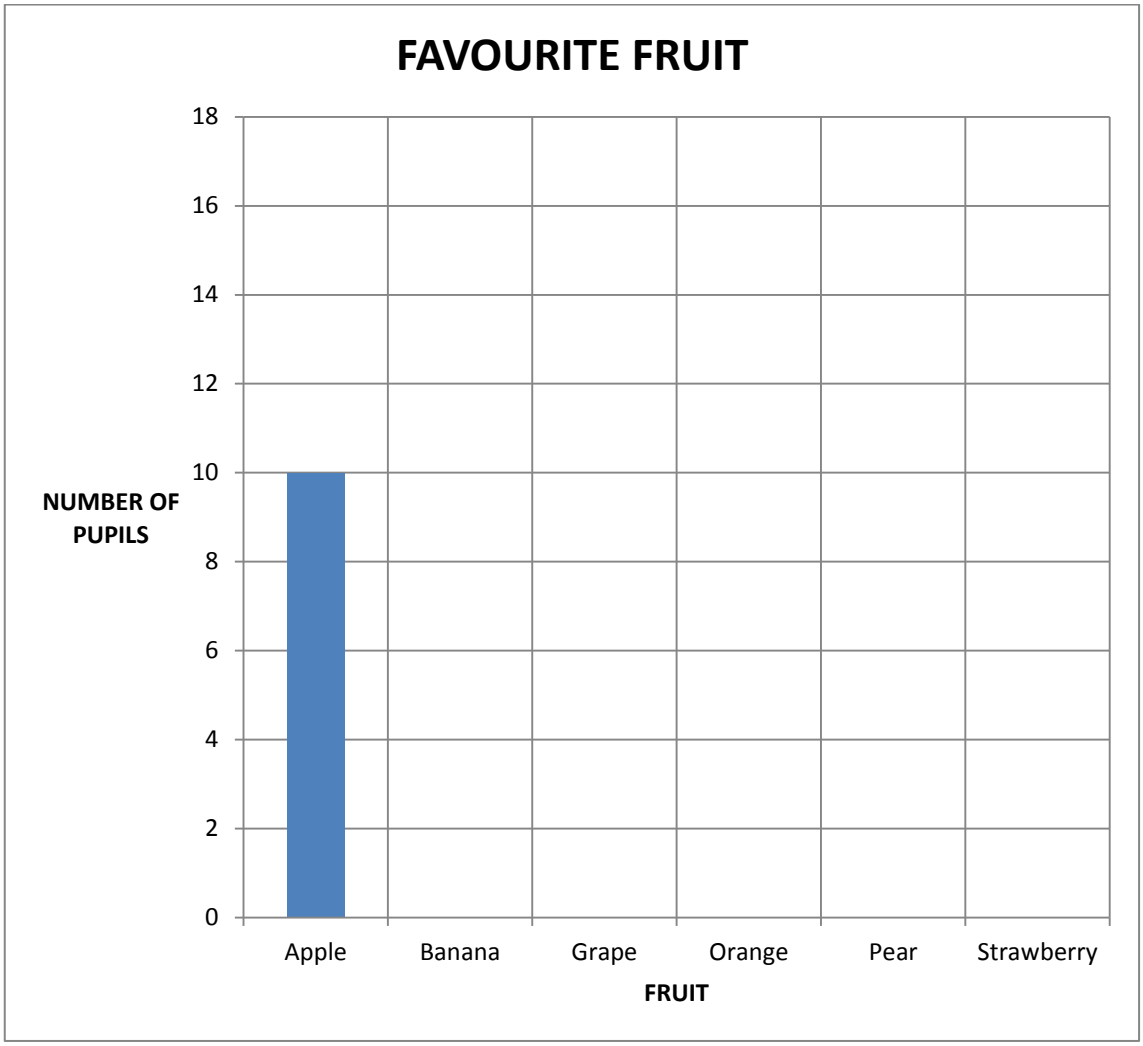
An important part of this area of study could involve carrying out a survey. As a result, one example includes a frequency table, a fairly simple method of gathering and making sense of data. This in turn could be extended to drawing a suitable graph to illustrate the data.

# Learning context: Standalone

**EXAMPLE**
In a survey, 50 pupils were asked to name their favourite type of fruit.
In the survey, 10 chose apple, 14 chose banana, 8 chose grape, 12 chose orange, 4 chose pear and the rest chose strawberry.

(a) How many pupils chose strawberry?

The results of the survey were illustrated in a bar graph.




(b) Complete the bar graph.

This can be adapted to many different contexts.

# Learning context: Across-learning situation

**EXAMPLE**
A small local survey asked about the number of pairs of jeans owned by men and women (over 16).

The results are listed below.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3 | 4 | 2 | 8 | 3 | 6 | 7 | 2 | 4 | 7 |
| 1 | 5 | 3 | 4 | 2 | 6 | 6 | 3 | 5 | 2 |
| 4 | 5 | 2 | 6 | 7 | 4 | 4 | 3 | 2 | 3 |
| 2 | 3 | 4 | 1 | 6 | 6 | 7 | 3 | 3 | 8 |

(a) Complete the frequency table for these numbers.

| Number of pairs of jeans | Tally marks | Frequency |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| | Total | |

(b) How many pairs of jeans were reported in the survey?

NOTE TO TEACHER/LECTURER: In part (b), learners should be encouraged to check their answer as it can be arrived at by both counting and adding.

Possible extensions could be to illustrate the results in a bar graph and to compare the results with a different age group, or a different item of clothing such as a jacket.

Other ideas for interdisciplinary study could involve rainfall and temperature graphs in popular holiday venues such as Spain. Holiday brochures and internet information could provide useful sources of data.

Learners could also draw a map or plan of a room using two dimensional shapes to represent three dimensions.

# Learning context: Vocational

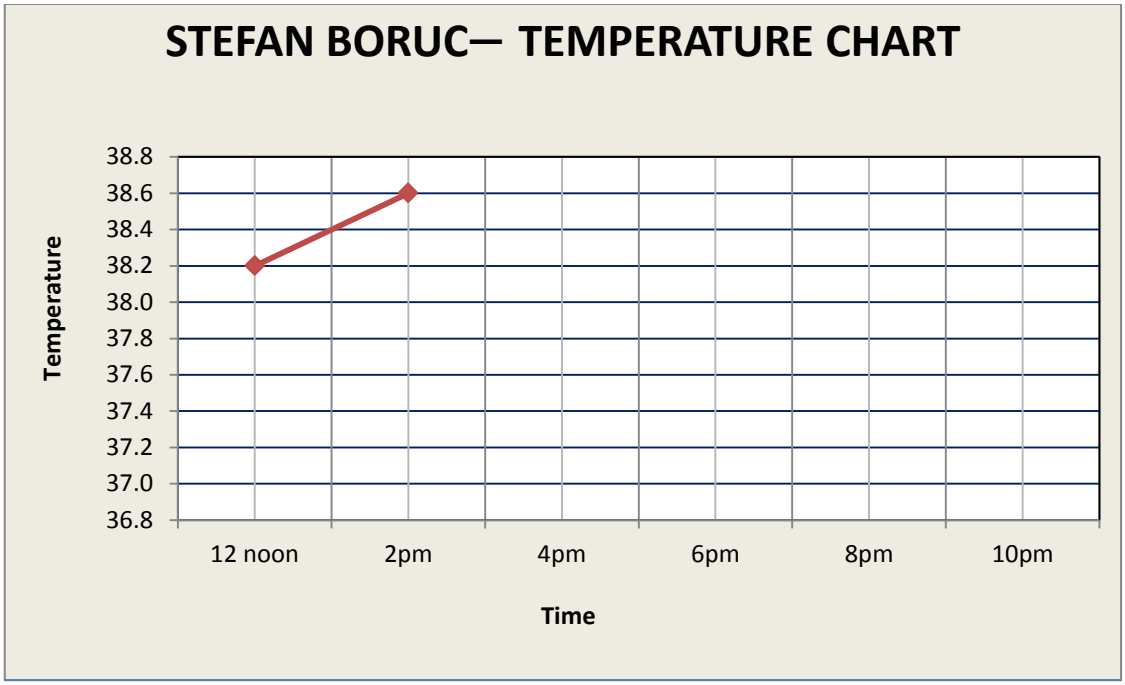
**EXAMPLE**
Stefan Boruc is a patient in a hospital.

A nurse is recording his temperature every two hours.

The results are shown in the table below.

| **Stefan Boruc: Temperature** | | | | | | |
|---|---|---|---|---|---|---|
| Time | 12 noon | 2pm | 4pm | 6pm | 8pm | 10pm |
| Temp (°C) | 38.2 | 38.6 | 38.2 | 37.6 | 37.4 | 37.2 |

The nurse has to record the results on a line graph.




Use the data in the table to continue the line graph.

NOTE TO TEACHER/LECTURER: This example could lead to discussion of the trend of the graph.

# Appendix: Reference documents

The following reference documents will provide useful information and background.

- Assessment Arrangements (for disabled candidates and/or those with additional support needs) — various publications on SQA's website: http://www.sqa.org.uk/sqa/14976.html
- Building the Curriculum 4: Skills for learning, skills for life and skills for work
- Building the Curriculum 5: A framework for assessment
- Course Specifications
- Design Principles for National Courses
- *Guide to Assessment* (June 2008)
- Overview of Qualification Reports
- *Overview of Qualification Reports*
- *Principles and practice papers for curriculum areas*
- *Research Report 4 — Less is More: Good Practice in Reducing Assessment Time*
- *Coursework Authenticity — a Guide for Teachers and Lecturers*
- SCQF Handbook: User Guide (*published 2009)* and SCQF level descriptors (to be reviewed during 2011 to 2012): www.sqa.org.uk/sqa/4595.html
- *SQA Skills Framework: Skills for Learning, Skills for Life and Skills for Work*
- *Skills for Learning, Skills for Life and Skills for Work: Using the Curriculum Tool*
- SQA Guidelines on e-assessment for Schools
- SQA Guidelines on Online Assessment for Further Education
- SQA e-assessment web page: www.sqa.org.uk/sqa/5606.html

# Administrative information

**Published:** April 2013 (draft version 1.0)

## History of changes to Advanced Higher draft Course/Unit Support Notes

| Course details | Version | Description of change | Authorised by | Date |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |