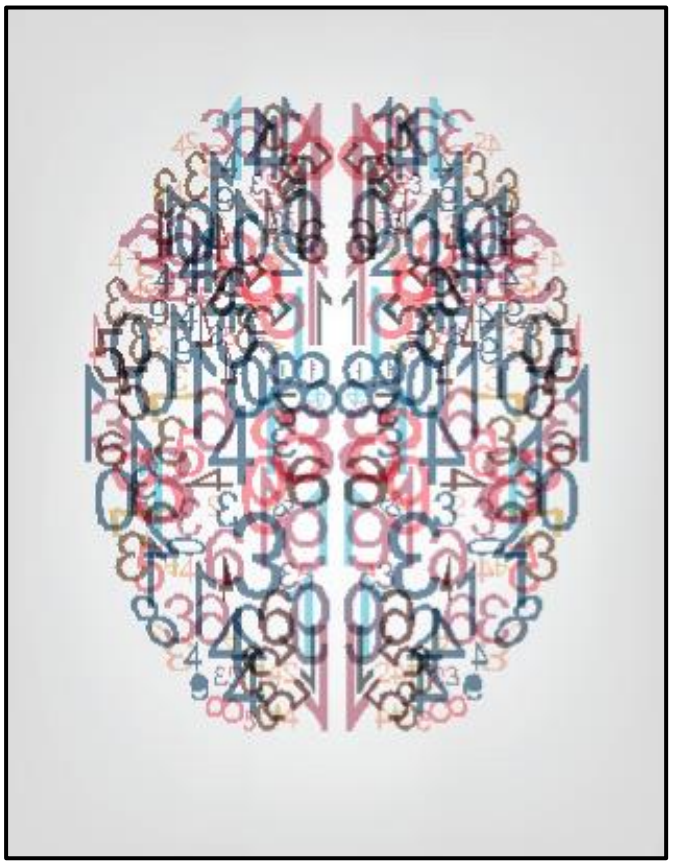
Additional Support Notes

National 5 Numeracy 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 5.

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

- Numeracy (National 5) Unit Specification
- Numeracy (National 5) Unit Support Notes

And where the National Numeracy Unit is part of the National 5 Course in Lifeskills Mathematics:

- National 5 Lifeskills Mathematics Course Specification
- National 5 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 5) Unit in its coverage of Core Skills Numeracy at SCQF Level 5. The learning and teaching approaches mentioned here are not exhaustive and are there for guidance only.

The skill that is being clarified and exemplified here is to:

- communicate information in at least one of the following: tables, graphs, charts or diagrams

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

- standalone
- from across learning
- in a vocational context

Communicating information using tables, graphs, charts or diagrams.

At this level, learners should be able to decide upon an appropriate form in which to convey particular information. Discussion should take place on the appropriate use of graphs and diagrams and their key features. The suitability of using box plots, stem and leaf diagrams, histograms, dot plots and cumulative frequency graphs could be investigated as well as more familiar graphs such as line graphs, bar graphs, pie charts and distance-time graphs. Graphs at this level could include more complex ideas such as qualitative graphs in which situations that do not necessarily have numerical values are represented.

It is intended that the following examples will clarify these comments and provide teaching ideas.

Learning context: Standalone

An example in which learners have to decide on an appropriate way of illustrating a particular set of data would be recommended. Learners could then be asked a supplementary question in which they are asked to interpret the graphical data.

EXAMPLE
During a survey at a health club, the ages of a sample of women attending the club were recorded.

24	32	51	43	19	25	29	23
31	50	47	30	25	27	18	23
38	28	43	35	52	32	36	18

During the survey, the ages of a sample of men attending the health club were also recorded.

48	56	62	58	35	35	30	25
20	32	43	28	60	46	37	39
40	55	76	48	47	25	32	48

(a) Draw an appropriate statistical diagram to compare these two sets of data.

(b) Comment on any differences between the ages of the men and women attending the club.

NOTE FOR TEACHER/LECTURER: Various graphs or diagrams would be acceptable. A back-to-back stem and leaf diagram would seem to be the most appropriate. However, learners could draw two box plots with a common scale. Some learners may group the two sets of data using class intervals and then draw a compound bar graph. Discussion could take place on the different types of answers given. In the comment part of the question, learners should be encouraged to comment on which group (men or women) seems to be older and on the spread of ages for each group. This could also cover aspects of other Units in Lifeskills Mathematics at National 5.

Learning context: Across-learning situation

There are many topics in other subject areas that need to be displayed and analysed using graphs, charts and tables. One area would be within Modern Studies and politics, including mock elections. The results of such projects could be illustrated graphically. A pie chart would be a suitable way of showing the results of an election and would be appropriate at Numeracy 5 as this would involve getting a total, calculating angles and using a protractor and compass to draw the pie chart. This also combines number skills with graphical skills.

Political party	*Number of votes*
Conservative Party	25
Green Party	20
Labour Party	60
Liberal Democrats	15
Scottish National Party	80

EXAMPLE
A mock election was carried out in a school to find which way the students would vote.

The results of the mock election are shown below.

Construct a pie chart to illustrate this information.
Show all your working.

NOTE TO TEACHER/LECTURER: This could also cover aspects of other Units in Lifeskills Mathematics at National 5.

Learning Context: Vocational

There are many areas in the workplace where the use of graphs, charts and tables are used. Learners could be asked questions involving a cumulative frequency graph. This has relevance in many aspects of working life such as when reliability is being tested, eg the lifetime of a battery. The curve is known as an ogive, a term which is used in architecture. This could prove an interesting introduction to this type of graph. The semi-interquartile range can be estimated from a cumulative frequency graph and this is a useful measure for consistency or reliability of a product or service.

EXAMPLE
A company manufactures high powered lamps. A sample of 100 of these lamps was chosen at random to find their lifetime.
The results are shown below.

Lifetime of lamp (t hours)	**Frequency**
$1200 \leq t \leq 1300$	4
$1300 \leq t \leq 1400$	10
$1400 \leq t \leq 1500$	16
$1500 \leq t \leq 1600$	24
$1600 \leq t \leq 1700$	20
$1700 \leq t \leq 1800$	14
$1800 \leq t \leq 1900$	8
$1900 \leq t \leq 2000$	4

(a) Construct a cumulative frequency column for the data.

(b) Using squared paper, draw a cumulative frequency diagram for this data.

(c) From your diagram, estimate the median and quartiles of the lifetime of a lamp.

(d) Estimate the semi-interquartile range.

NOTE FOR TEACHER/LECTURER: Key points on drawing a cumulative frequency diagram should be stressed:

- the cumulative frequency axis should be vertical
- the axes should be clearly labelled
- the horizontal scale should be continuous, ie 1200, 1300, 1400, etc
- the cumulative frequency should be plotted against the **upper limit** of the class interval
- a *smooth* curve should be used to join the points

Comparing the SIQR (semi-interquartile range) for two sets of data would be a useful extension to this to activity.

This could cover aspects of other Units in Lifeskills Mathematics and Mathematics at National 5.

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