

# Making the most of the Advanced Numeracy Preparation Materials at Level 3

## What are they?

These materials take the form of a pack which is intended as a resource for adult numeracy teacher educators and trainers. It contains resources and ideas for running programmes that develop the skills of prospective adult numeracy teachers in order to meet national Maths entry criteria at Level 3.

The materials do not match any nationally available programmes of study. They offer content for programmes that are locally developed. There is no definitive list of specific mathematical content for preparation programmes and alternative content is noted and suggested within the pack.

## How to use the pack

The chapters have been written by practising teacher educators, and as such, provide a very practical guide to running a preparation programme. The pack consists of the following chapters and sections.

### Chapter 1 Introduction and rationale

### Chapter 2 Self-assessment, number and geometry

- 2.1 Level 3 Self-assessment carousel activity
- 2.2 Checklist of Level 3 personal skills
- 2.3 Group summary checklist
- 2.4 Number systems and place value
- 2.5 Number systems
- 2.6 Egyptian multiplication
- 2.7 The commutative, associative and distributive laws
- 2.8 Approaches for dividing fractions
- 2.9 Pythagoras' theorem
- 2.10 Discovering ratios in right angled triangles
- 2.11 Trigonometry

### Chapter 3 Algebra and its applications

- 3.1 Kinaesthetic equations
- 3.2 Algebra carousel activity
- 3.3 I think of a number
- 3.4 Matching expressions
- 3.5 Simultaneous equations – ordering steps
- 3.6 Writing equations and solving

## **Chapter 4 Probability and statistics**

- 4.1 Probability bingo
- 4.2 Probability scale
- 4.3 Independent vs dependent events
- 4.4 Data handling carousel activity
- 4.5 Data classification activity
- 4.6 Location and dispersion sorting activity
- 4.7 Journey times activity
- 4.8 Fill the gap – bias in sampling
- 4.9 Correlation cards

## **Chapter 5 Error analysis**

- 5.1 Introduction to error analysis
- 5.2 Analysing learner errors – number
- 5.3 Analysing learner errors – fractions, decimals and percentages
- 5.4 Analysing learner errors – measure, shape and space
- 5.5 Analysing learner errors – data handling

## **Chapter 6 Teacher trainer notes**

## **Chapter 7 Exemplar schemes of work**

## **Chapter 8 Recommended resources**

## **Chapter 9 Exemplar entry assessment material**

In addition, there are references and links to a number of PowerPoint presentations which can be used in training.

Note that the pack is intended to offer indicative content, rather than be fully comprehensive. The pack offers a number of approaches that can be taken in teacher training, or indeed in teaching at any level.

In addition to the resources in the pack, a number of other more traditional worksheets and texts could be used to enable participants to practise the skills identified in the pack. Further appropriate material can be found in a range of Higher Level GCSE textbooks or online.

## **More about the content**

### **Learning mathematics in the context of adult numeracy teaching**

It has become established practice to set all numeracy teaching and learning in an appropriate context and, the context here is numeracy teacher education and training. With this in mind, the pack was developed to include a number of elements that teacher trainers might consider when running their own programmes.

These elements are important for all levels of numeracy training and it was thought helpful to identify these issues at the preparation stage.

The elements are:

**Personal mathematics skills:** the pack has the development of personal mathematics skills as its primary focus. Many reports on adult numeracy provision voice concerns about the quality and competence of those who support the numeracy development of the workforce. It is believed that numeracy teachers need to have maths skills at a higher level than the previously accepted norms.

**Self-assessment:** the first section includes a carousel of self-assessment tasks so that trainees can identify their own strengths and areas for development. This provides an opportunity for the trainer to observe trainees on task, and also to identify individual support needs. The resulting needs analysis is useful for planning individual support and drawing up personal development plans. Additionally, the self-assessment tasks give participants an overview of what they will be studying on the course.

**History of mathematics:** the pack content includes an element of the history of mathematics. This gives participants an opportunity to place mathematical problems in a historical context and emphasises the way mathematics can change over time. Variations in development in different geographical locations and cultures help to give participants a broader and more rounded view of mathematics and its place in society. For some, engagement with the history of mathematics is a motivation for learning and doing. In the context of a multicultural classroom, the history of maths activities is a practical approach to inclusiveness and valuing diversity.

**Profound understanding of fundamental mathematics:** One approach used on such a course is to promote a 'profound understanding of fundamental mathematics'. This means understanding the basic elements of mathematics in many ways, for example understanding a variety of models that can be used to understand multiplication of fractions. In addition, the need to make connections is emphasised by research by NRDC on what makes for effective teaching.

**Sophisticated use of elementary mathematics:** Sections on data handling include a look at how individuals perform quite complex analysis using relatively simple statistical techniques. It has been argued that in today's workplace, the usage of mathematics is more likely to be a sophisticated application of basic mathematical calculations supported by technology, and decision-making, facilitated by data analysis tools.

**Errors and misconceptions:** The topic of learner errors and misconceptions runs like a thread through the course. Its inclusion provides an opportunity for participants to review their own mathematical skills and knowledge and also provides an opportunity to address pedagogy on a course that has personal skills as its primary focus, as a range of alternative teaching and learning strategies and techniques can be explored.

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