

# Participant pack

## Module 12d: Developing functional mathematics with vocational learners

### Training the trainers

#### Handouts

HO 1: Aims and outcomes

HO 2: Staff training needs analysis (pre-course task)

HO 3: Data handling activities

HO 4: Support for English, maths and ESOL – new CPD modules overview

HO 5: Useful websites

#### PowerPoint slide notes

## **HO 1 : Aims and outcomes**

### **Aims**

To assist trainers and managers in working with a range of teachers to develop the functional mathematics skills of vocational learners

To consider how existing training modules might be customised and adapted for different cohorts and contexts.

### **Outcomes**

By the end of the session participants will have:

- shared and discussed some training needs and issues relating to vocational staff whose role involves teaching functional maths to vocational learners;
- experienced sample activities from each of Modules 12a, 12b and 12c, and reflected on the content in relation to their own professional contexts;
- considered how to adapt the content of Modules 12a, 12b and 12c for their own contexts and how to follow up and consolidate the module content; and
- identified what further content could be included in CPD sessions for those responsible for developing the numeracy skills of vocational learners.

## **HO 2: Staff training needs analysis (pre-course task)**

Before attending the training module, you need to collect information from your organisation to identify the roles and training needs of those staff who teach or support functional mathematics skills with vocational learners.

This may involve:

- **Talking to vocational and specialist maths/numeracy staff** about what challenges they encounter in teaching and supporting functional mathematics with vocational learners, and what types of training and support would help them.
- **Talking to managers** about issues facing the organisation in relation to functional maths, and any relevant strategic or operational plans.
- **Talking to those responsible for lesson observation** (and/or reading summaries of observation reports) and identifying any issues that have been raised with regard to functional maths
- **Talking to vocational learners** about how well they feel supported in developing their numeracy skills, and what might help them further.

**Please make notes of your findings and bring them to the training session.**

### HO 3: Data handling activities

<b>Activity</b>	<b><i>How could this be adapted for my vocational learners?</i></b>	<b><i>How could this be adapted for different levels?</i></b>
<b>A. Sampling</b>		
<b>B. An average exercise</b>		
<b>C. Using averages</b>		

<b>D. Which is better?</b>		
<b>E. Labels</b>		
<b>F. True or false?</b>		
<b>G. Clues</b>		

## **HO 4: Support for English, maths and ESOL: new CPD modules overview**

Downloaded from <http://www.excellencegateway.org.uk/node/21277>

## HO 5: Useful websites

### Adult numeracy core curriculum

<http://www.excellencegateway.org.uk/node/1514> New interactive online version. As well as the numeracy curriculum, there are sections on embedding, family learning and employability, links to resources and other curricula, ideas, suggestions and activities, personal space, contributions from other tutors and more.

### BBC Skillswise

<http://www.bbc.co.uk/skillswise/maths>

Online and paper-based resources for adult numeracy learners.

### Being Functional resources

<http://tlp.excellencegateway.org.uk/tlp/fs/fs-resources/about.php>

[A range of functional skills resources, including CPD activities.](#)

### Braingames

<http://www.braingames.org.uk/>

Online interactive learning materials in a games format, including English and maths.

### Excellence Gateway - nationally developed Skills for Life materials

<http://rwp.excellencegateway.org.uk>

Resources developed over the period 2001 to 2010 to support the national Skills for Life Strategy and other Skills for Life developments.

### Embedded learning materials

<http://rwp.excellencegateway.org.uk/Embedded%20Learning/>

An extensive range of materials to support embedded learning (including numeracy) in over 25 vocational, community, employability and health settings.

### Functional skills on the Excellence Gateway

<http://www.excellencegateway.org.uk/node/21154>

See this menu page to access the range of functional skills resources on the Excellence Gateway, including the new functional skills starter kit:

<http://www.excellencegateway.org.uk/node/20280>

### Improving Learning in Mathematics

<http://tlp.excellencegateway.org.uk/teachingandlearning/downloads/default.aspx#math>

Resources for improving teaching in mathematics, including a selection of downloadable materials. Aimed primarily at Level 2 and 3 learners.

### Learning Mathematics in Context

<http://tlp.excellencegateway.org.uk/tlp/xcurricula/lmic/>

Ideas and resources to help you explore teaching and learning mathematics within vocational and other subject areas.

### Mathematical Moments

<http://tlp.excellencegateway.org.uk/tlp/stem/stem-mm.html>

Each Mathematical Moment invites you to focus on a particular mathematical topic, offers you suggestions for activities you could carry out with your learners, prompts you to anticipate, and then reflects on learners' responses, and finally offers you some follow-up ideas. The topics are addressed at levels ranging from Entry to Level 3.

### **Move On**

<http://www.move-on.org.uk/>

English and Maths resources for teachers, learners and providers, encompassing promotion, engagement and delivery. Check out Stop 4 of the Teacher Route.

### **National Centre for Excellence in the Teaching of Mathematics**

<https://www.ncetm.org.uk/>

Resources and tools for teachers of maths and numeracy across all sectors (primary, secondary and FE). Check out the following pages. Note that you need to register before accessing these materials.

Numeracy Challenge <https://www.ncetm.org.uk/resources/13790>

Maths at Work <https://www.ncetm.org.uk/resources/11329>

FE Magazine <https://www.ncetm.org.uk/resources/14609>

Mathemapeda <https://www.ncetm.org.uk/mathemapeda/>

Thinking Through Maths (online CPD module) <https://www.ncetm.org.uk/reflective-learning/ttm>

### **Northern College**

<http://www.northern.ac.uk/content/?id=133>

Active resources for teaching functional mathematics (Entry 3 and Level 1).

### **Nrich**

<http://nrich.maths.org/public/index.php>

Free mathematics enrichment materials (problems, articles and games) for teachers and learners. Aimed at ages 5 to 19 years, but much is suitable for adults.

### **OCR support materials for Functional Skills Maths:**

Level 1: <http://www.ocr.org.uk/qualifications/type/fs%5F2010/maths/l1/documents/>

Level 2: <http://www.ocr.org.uk/qualifications/type/fs%5F2010/maths/l2/documents/>

Tasks to use as teaching resources or practice assignments.

### **Office of Fair Trading Skilled to Go**

<http://www.offt.gov.uk/about-the-offt/partnership-working/partnership-working-info/consumer-education/resources/sthome>

A teacher's toolkit of games and resources for consumer education, with literacy and numeracy embedded.

### **Resources to support the pilot of functional skills**

<http://www.excellencegateway.org.uk/page.aspx?o=201311>

Teaching and learning functional mathematics

### **Skills Workshop**

<http://www.skillsworkshop.org/>

Free downloadable Skills for Life and functional skills resources from this private

website.

**Subtangent**

<http://www.subtangent.com>

Interactive maths games and resources that can be used on line or downloaded.

**Tarsia Formulator**

[http://www.mmlsoft.com/index.php?option=com\\_content&task=view&id=4&Itemid=5](http://www.mmlsoft.com/index.php?option=com_content&task=view&id=4&Itemid=5)

Free downloadable software to help create your own mathematical jigsaws and domino activities.

## PowerPoint slide notes



Support for English, maths and ESOL

Module 12d: Developing functional mathematics with vocational learners - training the trainers

Transport to work



- What form of transport do you normally use to get to work?
- Group yourselves according to the transport used.
- Organise the data and use mini-whiteboards to represent it.

Starter activities



In pairs / small groups, discuss:

- What is the purpose of a starter activity?
- What makes an effective starter activity?

## Aims



- To assist trainers and managers in working with a range of teachers to develop the functional mathematics skills of vocational learners
- To consider how existing training modules might be customised and adapted for different cohorts and contexts.

## Learning outcomes



By the end of the training session, participants will have:

- Shared and discussed some training needs and issues relating to staff whose role involves developing numeracy with vocational learners
- Experienced sample activities from each of Modules 12a, 12b and 12c, and reflected on the content in relation to their own professional contexts
- Considered how to adapt the content of Modules 12a, 12b and 12c for their own contexts and how to follow up and consolidate the module content
- Identified what further content could be included in CPD sessions for those responsible for developing the numeracy skills of vocational learners

## Issues and training needs



What are the main training needs and issues for staff with regards to the teaching and learning of numeracy for vocational learners?

In what ways are these needs different for vocational tutors, numeracy specialists, assessors, etc?

Discuss in small groups:

- What similarities / differences are there across your organisations?

## Overview of the modules



	Primary Focus	Secondary Focus
Module 12a	Handling data	Process skills and problem solving
Module 12b	Number concepts	Conceptual understanding and misconceptions
Module 12c	Common measures, shape and space	Summative assessment for functional skills

## Common themes



The modules also have the following theme running through them:

- The numeracy curriculum and its relevance to different vocational areas
- Functional skills and the application of maths to solve problems
- Active and collaborative approaches to learning maths

## Module 12a: Handling data



Activity	Content
1 Starter: transport to work	Participants generate simple data using functional skills approach
2 Introductions	Introductions and content of the session
3 Functional mathematics: process skills	Introducing process skills in functional mathematics, and identifying these in practical problems
4 Challenge of functional skills	Identifying the difference between contextualised and functional maths, and examining the content of functional skills assessments
5 Data handling in vocational areas	Identifying the content of data handling in the numeracy core curriculum, and relating this to vocational areas
6 Creating a story	Creating a story for a bar chart with no labels on the axes. Identifying different types of questions that can be asked of the chart.
7 Carousel of activities	Experiencing a range of activities for active learning in data handling, and adapting these for vocational learners
8 Planning a data handling activity	Planning a purposeful data handling activity that is relevant to learners' vocational areas
9 Summary and next steps	Reflecting on what has been learned and what can be put into practice.

## Reflections on Module 12a



- Which sections and activities would be most useful to teachers in your organisation?
- Are there any that you wouldn't use?
- How might you adapt the materials for your organisation?

## Data handling carousel



A selection of data handling activities is laid out on the tables

- Working in pairs or small group, try out and discuss the activities
- Make notes on your handout about how each might be adapted for vocational learners and different levels

## Module 12b: Number concepts



Activity	Content
1 Starter: Equivalence cards	This starter activity uses commonly occurring fractions to explore the concept of alternative forms of representation
2 Introductions	Outline of the session with aims and intended outcomes. Participants introduce themselves
3 Functional maths in vocational contexts	Participants identify naturally-occurring maths in their own vocational context
4 Calculating skills related to whole number	This section enables participants to experience the wide range of approaches to carrying out the four operations
5 Developing conceptual understanding	Participants develop their own conceptual understanding of maths through a variety of activities which they can use, or adapt for use, with their learners.
6 Exploration of common errors	Examining how the exploration of errors and misconceptions can lead to a greater understanding of underlying mathematical concepts
7 Proportional reasoning	An opportunity to see that enabling learners to work through a process with simple numbers will help them identify which operation to use when the numbers are more complex
8 Summary and next steps	Reflecting on what has been learned and what can be put into practice

### Reflections on Module 12b



- Which sections and activities would be most useful to teachers in your organisation?
- Are there any that you wouldn't use?
- How might you adapt the materials for your organisation?

### Reflection on ordering activity



- What is the value of this type of concrete activity for concept development? Why?
- How might the activity be adapted for other mathematical concepts?
- How might you adapt it for different vocational areas?
- How could it be extended?

### Module 12c: Measures, shape and space



Activity	Content
1 Starter: Domino game	Matching domino game: Common measures
2 Introductions	Introduce each other and content of the session. Discuss the initial, diagnostic and summative assessment used by the participants and / or their organisations
3 Identify the measures, shape and space curriculum	Exploring the content of the measures, shape and space curriculum and its relevance to vocational contexts
4 Examiners' reports and common errors	Identifying common errors in measures, shape and space and the reasons for these
5 Example activities for teaching measures, shape and space	Modelling alternative approaches to teaching concepts where errors are frequently seen
6 Links to summative assessment	Review of a specimen exam question and writing one for a given vocational context
7 Summary and next steps	Reflecting on what has been learned and what can be put into practice

### Reflections on Module 12c



- Which sections and activities would be most useful to teachers in your organisation?
- Are there any that you wouldn't use?
- How might you adapt the materials for your organisation?

### Example question



**As you work through the question consider:**

- What will learners find challenging?
- What are the implications for your teaching?
- What steps can you take to better prepare your learners for the summative assessment?

### Progression factors in functional maths



Technical demand of the maths	Complexity of the problem	Familiarity of the situation	Independence of the learner
Lower level	Simple	Familiar	Supported
↓	↓	↓	↓
Higher level	Complex	Unfamiliar	Independent

#### Further sources of professional development



- Development of personal maths skills
- Other LSIS functional skills modules
- Numeracy subject specialist diplomas
- Wider professional development

#### Personal maths skills



Many staff may have maths development needs themselves. Qualifications include:

- Functional mathematics – up to Level 2
- GCSE mathematics
- Level 3 Award in Mathematics for Numeracy Teaching

#### Other LSIS CPD modules



- LSIS has developed a suite of CPD modules to support English, maths, ICT and functional skills
- Full details can be found at:  
<http://www.excellencegateway.org.uk/node/21207>

## Numeracy specialist diplomas



To be regarded as a 'fully qualified' numeracy teacher, staff should hold a specialist diploma in numeracy teaching:

**a Level 5 Diploma in Teaching Mathematics (Numeracy)**

- An additional standalone qualification for teachers who already hold a generic teaching qualification.

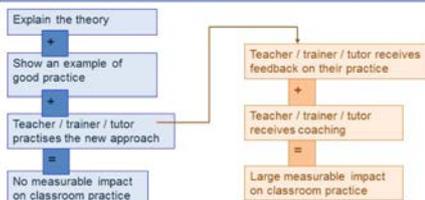
**or a Level 5 Diploma in Teaching in the Lifelong Learning Sector (Mathematics / Numeracy)**

- An integrated DTLLS course for teachers who don't hold a generic teaching qualification.

## Wider professional development



### Continuing professional development: a model for transfer



Based on research by Joyce and Showers (2002).  
Used by the Standards Unit

23

## Planning CPD



**Consider how the content of Modules 12a, 12b and 12c might be adapted for your own context.**

**Use the materials to plan a CPD event or programme for staff in your organisation.**

- How might you restructure the modules, e.g. 'mixing and matching' the content?
- How might you extend or consolidate the content and what other models of CPD could you use to do this?
- What further content might be usefully included in future CPD sessions for your staff?

### Session outcomes



**By the end of the training session, participants will have:**

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- Considered how to adapt the content of Modules 12a, 12b and 12c for their own contexts and how to follow up and consolidate the module content.
- Identified what further content could be included in CPD sessions for those responsible for developing the numeracy skills of vocational learners.

