

OCR Teaching in the Lifelong Learning Sector – Qualification Units

Unit 33 – Level 5 Numeracy and the Learners

Level 5

QAN Accreditation Number A/601/8235

Unit description

Unit aims

The aim of this unit is to develop an understanding of the impact of learners' background on numeracy learning, and how to identify the attainment and aspirations of numeracy learners. To develop knowledge and understanding of the numeracy and language/literacy skills which are integral to learners' achievement in numeracy.

Credit value 15

Unit synopsis

This unit is about:

- Knowledge of popular perceptions of numeracy
- Understanding of the implications of background and personal development on numeracy learning
- Evaluation and use of appropriate assessment methods, tools and procedures to identify attainment and aspirations
- Reflection on own strengths and weaknesses in relation to numeracy skills, knowledge and understanding
- Understanding of the different ways in which language/literacy skills are integral to learners' achievement in numeracy.

Examples of teaching and learning strategies

The following teaching methods and learning strategies are appropriate to the delivery and development of the knowledge, understanding and skills covered in this unit. A variety of these should be used to provide a model of good practice to the candidate. This list is not exhaustive:

- Small group discussion

- Directed study and research
- Lecture
- Resource based learning
- Question and answer
- Micro teaching session
- Role play
- Discussion
- Lecture and exposition
- Games
- Workshop activities
- Tutorials

Guidance on delivery for centres

For many candidates this may be the first opportunity to explore in depth numeracy acquisition and the relationship between personal backgrounds and numeracy development.

Appropriate methods of delivery:

- Provision of individual learning plans
- Provision of guidance on the qualification and progression routes to further development
- Provision of opportunities for learning e.g. discussion, tutorials, workshop activities etc
- Provision of ongoing mentoring to the candidate, including review and feedback on learning experiences and development of competence
- Observation of peer-to-peer discussions of groups of candidates or of discussions with colleagues
- Observation of candidates working within a partnership

Professional discussion with the assessor will test the knowledge requirements, where these are not already met through the activities described above.

Guidance on assessment for centres

The assessment can include:

- Written assignment
- Case studies
- Research projects
- Student assessments
- Individual learning plans
- Lesson plans
- Written review of students progress.

This is a level 4 unit and thus the candidate must demonstrate complex skills and knowledge in this particular area of numeracy acquisition and use. The ability to recognise and develop thinking across these criteria is to be encouraged but it does mean that written evidence, whilst aiming for succinctness and clarity of thought, will

need to be of sufficient depth and breadth to meet the level 4 standard. There is an expectation that the written work will be presented at the appropriate level.

Suggested reading

The following list is not intended to be exhaustive, but provides suggested texts which candidates may find helpful. It is not compulsory for students to read all publications in the list; they are identified for reference only.

Bolton, G. (2005) *Reflective Evidence Practice, Writing and Professional Development* (2nd ed) London: Sage

Brittan, J. (1996) *An Introduction to Numeracy Teaching* London: BSA.

Brooks, G. and Pollard, A. (2005) *Assessing Adult Literacy and Numeracy: A Review of Assessment Instruments* London: NRDC.

Buxton, L. (1981) *Do you Panic about Maths? Coping with Maths Anxiety* London: Heinemann.

Chinn, S.J. (2004) *The Trouble with Maths: A Practical Guide to Helping Learners with Numeracy Difficulties*. London: Routledge.

Coben, D. et al. (2007) *Effective Teaching and Learning Numeracy* London: NRDC.

Flegg, G. (1984) *Numbers, their History and Meaning* London: Andre Deutsch.

Hamilton, M. and Hillier, Y. (2006) *Changing Faces of Adult Literacy, Language and Numeracy, A Critical History*. Stoke-on-Trent: Trentham.

Henderson, A. (1998) *Maths for the Dyslexic, A Practical Guide*. London: Fulton.

Herrington, M. and Kendall, A. (eds) (2005) *Insights from Research and Practice: A Handbook for Adult Literacy, Numeracy and ESOL Practitioners*. Leicester: NIACE.

Mercer, N. (2000) *Words and Minds* London: Routledge.

Reece, I. and Walker, S. (2006) *Teaching Training and Learning* (6th ed) Sunderland: Business Education.

Swan, M. (2006) *Collaborative Learning in Mathematics, A Challenge to our Beliefs and Practices* Leicester: NIACE.

Swan, M. (2005) *Improving Learning in Mathematics: Challenges and Strategies* Sheffield: DfES Standards Unit.

Tett, L., Hamilton, M. and Hillier, Y. (2006) *Adult Literacy, Numeracy and Language* Maidenhead: OUP.

Wallace, S. (2007) *Teaching, Tutoring and Training in the Lifelong Learning Sector (Achieving QTLS)* (3rd ed) Exeter: Learning Matters.

Websites

www.ocr.org.uk

www.qca.org.uk

Qualifications and Curriculum Authority

www.dfes.gov.uk

Department for Children, Schools and Families

www.lluk.org.uk

Lifelong Learning UK

www.move-on.org.uk

www.LSNeducation.org

Learning and Skills Network

www.skillsforlifefnetwork.com

www.lifelonglearninguk.org Lifelong Learning UK: Professional Standards for teachers of Mathematics (Numeracy)

www.Maths4Life.org Resource: 'Thinking Through Mathematics, strategies for teaching and learning' DfES 2007

www.ncetm.org.uk/ The National Centre for Excellence in Teaching of Mathematics (NCETM)

www.nrdc.org.uk National Research and Development Centre for adult literacy and numeracy

www.dfes.gov.uk/readwriteplus Adult Numeracy Core Curriculum and related documents

Assessment Criteria, Knowledge and Evidence Linked to Practice

1.

	Assessment Criteria	Knowledge	Evidence Linked to Practice
1.1	Analyse the role of mathematics and numeracy in the world at large.	The position of mathematics in the education system and in wider society.	Written evidence discussing: <ul style="list-style-type: none"> the role of mathematics and numeracy in the world at large popular perceptions of mathematics and numeracy and the impact on the learner the links between numeracy development and other areas of personal development the impact of learners backgrounds and needs on numeracy learning approaches to mathematics and numeracy assessment which take into account learners background.
1.2	Discuss public/popular perceptions of mathematics and numeracy and the impact on the learner.	Use of mathematics in personal life and vocational contexts.	
1.3	Justify the importance of encouraging learners to make links between their numeracy development and other areas of their personal development.	Effect of mathematical/numeracy skills, or lack of, on life in society. The nature of mathematics related anxiety.	
1.4	Analyse the impact of learners' backgrounds and needs on numeracy learning.	Use of a range of motivations for learning numeracy. Links between numeracy development and other areas of personal development.	
1.5	Evaluate approaches to mathematics and numeracy assessment which take into account learner backgrounds.	The possible effects of social background, gender, culture, age and personal circumstance on numeracy learning. The possible effects of physical disabilities, mental health issues and learning difficulties on numeracy development. How to adapt numeracy assessment tools in order to make them more accessible to learners without compromising what is being assessed.	

2.

	Assessment Criteria	Knowledge	Evidence Linked to Practice
2.1	Establish existing skills, knowledge and understanding and ascertain what learners can do as well as what they cannot do.	Initial assessment methods including screening, initial and diagnostic assessment methods.	Three case studies including: <ul style="list-style-type: none"> • initial assessment and identification of learners strengths and weaknesses • identification of areas which interest, motivate and inspire the learners with appropriate use of these areas to enhance achievement of learners aspirations • use of techniques to encourage the learners to make links between their numeracy development and other areas of personal development.
2.2	Use the results of assessment and knowledge of learner's background to identify areas which interest, motivate and inspire individual learners and address needs, goals and aspirations.	Evaluation methods which identify areas of interest and aspirations for learners.	
2.3	Justify the importance of encouraging learners to make links between their numeracy development and other areas of their personal development.	Links between numeracy development and other areas of personal development.	

3.

	Assessment Criteria	Knowledge	Evidence Linked to Practice
3.1	Discuss the historic and cultural development of mathematics	<p>The historic and cultural development of mathematics including number systems, measuring systems, recording and processing of data</p> <p>The language and concepts associated with calculations and conversions between number bases</p> <p>Standard form and its application to real world situations</p> <p>Mental, written and diagrammatic strategies for calculations including those related to the four rules of number</p> <p>Metalanguage to describe and analyse strategies including decomposition, partitioning, commutative, associative and distributive laws</p> <p>Common errors and misconceptions in mathematical concepts, processes and algorithms</p> <ul style="list-style-type: none"> the links, connections and generalisations between a range of areas in mathematics/numeracy including: activities, processes and stages within a mathematical problem solving/investigation including exploring, generalising, sorting, hypothesising, modelling and interpreting 	<p>Written evidence discussing:</p> <ul style="list-style-type: none"> the historic and cultural development of mathematics the language and concepts associated with place value systems mental, written and diagrammatic strategies and the metalanguage used common errors and misconceptions and possible reasons why they occur <p>Written evidence identifying the processes, stages, links, connections and generalisations within a problem solving/investigation that you have undertaken</p>
3.2	Discuss the language and concepts associated with place value systems		
3.3	Compare a wide range of written, mental and diagrammatic strategies and the metalanguage to describe and analyse these		
3.4	Analyse a range of common errors and misconceptions and possible reasons why they occur		
3.5	Analyse the links, connections and generalisations that can be made between a range of areas in numeracy/mathematics		
3.6	Analyse the activities, processes and stages within a mathematical problem/investigation		

4.

	Assessment Criteria	Knowledge	Evidence Linked to Practice
4.1	Devise strategies to enable learners to develop appropriate numeracy language and vocabulary.	Strategies for encouraging active use of numeracy-related vocabulary.	Provide three case studies including: <ul style="list-style-type: none"> • identification of learners vocabulary skills related to numeracy • provision of learning strategies to improve learners understanding of appropriate mathematical language • provision of appropriate strategies to promote and encourage communication of mathematical ideas Written evidence discussing how context can affect approaches used for mathematical investigation, problem solving and interpretation of results.
4.2	Maintain an integrated approach to wider language and literacy skills needed to develop learners' numeracy skills.	Sources of linguistic confusion in numeracy. How to communicate with appropriate mathematical language.	
4.3	Use strategies to promote and encourage communication of mathematical ideas both between teacher and learner and learners themselves.	Issues that can occur with words with a specific meaning in a mathematical context which is different from their everyday language meaning.	
4.4	Discuss how context can affect approaches used for mathematical problem solving and investigation and also the interpretation of the results.	Issues that can occur when learners do not have English as a first language. Strategies to promote and encourage communication including: <ul style="list-style-type: none"> • oral and written work • individual, small group and whole class work • teacher and learner interaction • peer support. The role and implications of estimation and accuracy across the stage of a mathematics calculation. How the choice of mathematical methods may be influenced be context. Use of shortcuts, diagrams and practical experimentation.	

	Interpretation and reporting of solutions.	
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