The Sector Skills Council for
lifelong learning

LIFELONG LEARNING UK
Skills for Learning Professionals

NEW OVERARCHING PROFESSIONAL STANDARDS FOR TEACHERS, TUTORS AND TRAINERS IN THE LIFELONG LEARNING SECTOR

APPLICATION OF THE PROFESSIONAL STANDARDS FOR TEACHERS OF MATHEMATICS (NUMERACY)

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CONTENTS

This document supports awarding institutions[1] developing subject specific qualifications. It is one of four documents required for developing qualifications for teachers of Mathematics (Numeracy) in the lifelong learning sector in England.

The other documents are:

1 **NEW OVERARCHING PROFESSIONAL STANDARDS FOR TEACHERS, TUTORS AND TRAINERS IN THE LIFELONG LEARNING SECTOR.**

These standards underpin all professional development of teachers, tutors and trainers.

2 **DEVELOPING QUALIFICATIONS FOR TEACHERS OF ENGLISH (LITERACY AND ESOL) AND MATHEMATICS (NUMERACY) IN THE LIFELONG LEARNING SECTOR IN ENGLAND.** *Interim information for awarding institutions.* Final information will be available when DfES regulations are published.

This provides detail about the structure, content and LLUK rules and requirements for these qualifications. A separate information document is available for generic teacher qualifications.

3 **DEVELOPING QUALIFICATIONS FOR TEACHERS OF ENGLISH (LITERACY AND ESOL) AND MATHEMATICS (NUMERACY) IN THE LIFELONG LEARNING SECTOR IN ENGLAND.** *Units of assessment*

This contains all units of assessment for literacy, ESOL and numeracy pathways. The units are also available in single subject documents for easy download from the LLUK Lifelong Learning UK website.

INTRODUCTION

From September 2007, new qualifications will be introduced for the initial training of teachers in the lifelong learning sector in England. Teachers of Mathematics (Numeracy) and English (Literacy and English for Speakers of Other Languages - ESOL) will continue to be required to gain subject specific teaching qualifications. Lifelong Learning UK (LLUK) is supporting the development of a range of flexible routes to achieving these qualifications.

This document has been written to support the development of new initial teaching qualifications for teachers of Mathematics (Numeracy) in the lifelong learning sector in England. It replaces the Further Education National Training Organisation (FENTO) *Subject Specifications for Adult Numeracy at level 4*[2]. It details the knowledge, understanding and professional practice to be demonstrated by teachers in relation to Mathematics (Numeracy). Awarding institutions will use it to develop qualifications for these teachers.

The reform of teacher training in England

In *Equipping our teachers for the future*[3] the Department for Education and Skills (DfES) outlined proposals for the reform of initial teacher education in the lifelong learning sector in England. As part of this reform, a new teaching qualifications framework has been developed by LLUK[4]. This will be introduced in September 2007. LLUK has developed new overarching professional standards for teachers, tutors and trainers in the lifelong learning sector. These professional standards will underpin all new initial qualifications including professional development for teachers. There will be new qualifications for those in a full teaching role at a minimum level 5 (QCF). There will also be qualifications for those in the newly defined 'associate' teaching role at a minimum of level 3.

Purpose of the document

The reform of initial teacher training detailed in 'Equipping our teachers for the future' provided an opportunity to revise the FENTO subject specifications. The revision has drawn on research and on the experience of both teacher trainers delivering and trainees undertaking qualifications developed using the specifications.

As with the FENTO subject specifications, this document defines the subject knowledge and understanding required of teachers of Mathematics (Numeracy). The FENTO subject specifications were a first attempt to define this nationally and were used to underpin subject qualifications introduced from September 2002. However, this document differs from the previous specifications in two important ways. Firstly, it no longer details any requirement relating to personal skills in Mathematics. This is detailed separately as an entry requirement to join programmes (see section immediately below this). Secondly, it introduces requirements relating to professional practice for Mathematics (Numeracy) teachers.

Those familiar with the FENTO specifications will note this document differs significantly in presentation and structure. This is explained below in the section *The application of the professional standards*.

Personal skills in Mathematics

LLUK will introduce an entry requirement for Mathematics (Numeracy) teacher training programmes from September 2007. LLUK will detail personal skills in Mathematics required at level 3 (QCF). As with all other trainees, those preparing to teach will have to evidence appropriate subject knowledge and skills before joining any teaching programme. LLUK will provide guidance on the requirement and how this can be evidenced. Trainees will, of course, develop these skills further during any programme but any requirement will be defined by the awarding institution's broader assessment strategy and not by LLUK. It should be noted that all teacher training programmes will include the minimum core of literacy, language, numeracy and ICT.

Mathematics (Numeracy) learning and teaching

The National Research and Development Centre for adult literacy and numeracy (NRDC)[5] researched teacher training programmes that used the FENTO subject specifications. The research recognised that subject knowledge and personal skills in Mathematics were developed and that the majority of trainees found this valuable. However, it identified a consensus that limited attention to subject specific learning and teaching provided inadequate preparation for teaching Mathematics (Numeracy). This was particularly the case for those taking a generic teacher training programme followed by the subject specific qualification. In addition, the OFSTED survey into initial teacher training[6] identified insufficient attention to subject learning and teaching generally within teacher training programmes.

LLUK has addressed this concern in the development of the new qualifications. The new professional standards contain a specific domain for specialist teaching to ensure teacher training programmes provide a focus for this.

NRDC research[7] found much value in the 'integrated' programmes that combined teacher training and subject qualifications. LLUK guidance for literacy, numeracy and ESOL teacher training programmes now details how all awarding institutions can develop initial teacher training qualifications for single subject cohorts. LLUK will encourage as many trainee teachers as possible to gain the required qualifications through this route. For those unable to access a subject specific training programme, the new subject specific continuing professional development (CPD) qualification will address learning and teaching in Mathematics (Numeracy), in addition to subject knowledge and understanding.

The application of the professional standards

The new professional standards for teachers describe consistent performance in terms of teachers' knowledge, understanding and professional practice. As the new professional standards are 'overarching' and apply to all teachers, it was considered appropriate to produce an application of these standards for teachers of Mathematics (Numeracy). The new professional standards detail the knowledge, understanding and professional practice for all teachers in any role. This document details the same for teachers of Mathematics (Numeracy) in particular, to be demonstrated through qualifications appropriate for the full teaching role at a minimum of level 5 (QCF).

LLUK is developing a similar application document for specialist 'Learning for living and work' teachers. As with the application documents for Mathematics (Numeracy) and English (Literacy and ESOL) the document will detail subject knowledge and professional practice required by those specialist teachers. It will also support the development of qualifications. This is not to suggest any requirement in terms of a regulated pathway. Development of guidance documents and qualifications is to ensure that appropriate opportunities for professional development are available. Subject specific application documents could be produced for any area of learning to underpin appropriate professional development opportunities.

Teachers of Mathematics (Numeracy)

Mathematics learning and teaching across all levels has many similarities and challenges. Following the Smith report[9] and the ACME report[10] the subject has a significantly increased level of national prominence. Developmental research based projects such as the DfES Standards Unit 'Improving Learning in Mathematics' and its subsequent extension 'Thinking Through Mathematics within Maths 4 Life' have given a much needed focus to the professional development of all teachers within the subject. Research based advances in practice have informed the document development.

This document offers a framework for both the development of subject specific teacher training qualifications and the content of their subsequent delivery. LLUK welcomes wider usage by awarding institutions to inform the professional development needs for those teachers who lead learning of Mathematics in the Learning and Skills sector in England at level 3 and above.

LLUK is to produce further guidance concerning effective practice in course delivery to support awarding institutions. This should be available in the summer of 2007.

This further guidance is not required for the development of qualifications.

ORGANISATION OF THE DOCUMENT

The new professional standards

These were published in December 2006 and should be used alongside this document. The professional standards detail the values, knowledge, understanding and professional practice expected of all teachers in the lifelong learning sector in England. This information is detailed in domains. The domains reflect the functions of the role. There are six domains:

Domain A Professional values and practice
Domain B Learning and teaching
Domain C Specialist learning and teaching
Domain D Planning for learning
Domain E Assessment for learning
Domain F Access and progression

References

1 LLUK uses this term to include National Awarding Bodies and Higher Education Institutions
2 FENTO (2002). Subject Specifications for Teachers of Adult Numeracy level 4
3 DfES (2004). Equipping our Teachers for the Future: Reforming Initial Teacher Training for the Learning and skills Sector
4 LLUK New Overarching Professional Standards for Teachers, Tutors and Trainers in the Lifelong Learning Sector (2006).
5 DfES Equipping our Teachers for the Future: Reforming Initial Teacher Training for the Learning and skills Sector (2004).
6 NRDC (2004). New initial teacher education programmes for teachers of literacy, numeracy and ESOL 2002/03.
7 OFSTED (2003) The initial teacher training of further education teachers, page 7 HMI
8 NRDC Towards a professional workforce 2007 and Review of literacy, numeracy and ESOL teacher education research 2006
9 Making Mathematics Count: The report of Professor Adrian Smith's Inquiry into Post-14 Mathematics Education 2004
10 ACME Mathematics in Further Education Colleges 2006

The values detailed in Domain A are repeated at the start of each domain to emphasise their importance in all aspects of the teaching role. Domain C will ensure a focus on specialist learning and teaching in generic teacher training programmes. In each domain, detailed after the value statements, there are a number of commitment statements. They could equally be represented as responsibilities. Under these are two columns detailing knowledge and understanding and professional practice. The coding of these is related to the value and commitment statements. Knowledge and understanding statements are coded by the domain letter, followed by K for knowledge and the number of the related commitment statement, for example, DK 1.1. Professional practice statements are coded by the domain letter, followed by P for practice and again, the number of the related commitment statement, for example, DP 1.1.

The application of the standards

This document details requirements against the domains of the professional standards. In developing an application of the professional standards for subject specific qualifications the need for domains B and C seemed unnecessary as all learning and teaching would be considered from a subject specific perspective on these programmes. As stated previously, the inclusion of Domain C is to ensure a focus on subject knowledge in generic teacher training programmes. To resolve this, the approach taken has been to detail only the subject knowledge and understanding requirements in Domain C and to detail requirements related to professional practice, learning and teaching, in Domain B.

Within the domains, requirements for Mathematics (Numeracy) teachers have been detailed against the value and commitment statements. It was considered unnecessary and unhelpful to try to detail the application of every knowledge and understanding and professional practice statement for teachers of Mathematics (Numeracy). Some value and commitment statements are generic in every sense and little could usefully be added to make them subject specific. The commitment statements are coded by the letter of the domain and S, for example, FS 2. All the value and commitment statements from the standards are included in this document. However, where it was felt there was nothing specialist to add this is made clear.

Requirements are detailed throughout this document as elements. A comprehensive list of these can be found in section one of this document. They are coded with the domain letter and then in number sequence. A suffix, .Ma denotes an element from the Mathematics application document (a suffix .En denotes an element from the document for English). Elements will be regulated by SVUK in qualifications developed for teachers of English (Literacy and ESOL) and Mathematics (Numeracy).

Extent of coverage of these elements is provided as guidance only and this is detailed in section 2. The use of the terms element and extent has been supported through consultation. The terms are used in the minimum core documentation and have been found to be useful. Extent is provided as guidance only. It has been developed in consultation with the field and reflects

the experience of teacher trainers and trainees. Those developing and delivering teacher education programmes will find it useful to consider this extent guidance when making any decision to include more or less than that detailed.

Elements have been written as areas of knowledge and practice for Mathematics (Numeracy) teachers. They detail the requirement for any value and commitment statement. The majority of commitment statements have several associated elements, a few have a significant number and some have none. The guidance on the extent of the coverage provided in Section 2 has been referenced to detailed statements in the new overarching professional standards.

Here is an example from Domain E

Standard ES 3
Learner involvement and shared responsibility in the assessment process
(This is a commitment statement from the professional standards)

Element E4.Ma
Develop strategies to involve learners in their own numeracy/ mathematics assessment.
(This is a required element for qualifications)
Mathematics (Numeracy) teachers know and understand:

- That previous learning experiences and views of mathematics can affect learner perceptions of teacher and learner roles in the numeracy learning environment. (EK 3.1, EK 3.2)
- The role of meta-cognition in mathematics/numeracy learning. (EK 3.1)

(This is guidance on extent – this particular guidance relates to subject knowledge. The references are to statements in the professional standards.)

Mathematics (Numeracy) teachers:

- Encourage learners to use a range of self-checking strategies in numeracy, for example, inverse operations, estimation, alternative methods of calculation. (EP 3.1, EP 3.2)
- Value learner methods of problem solving in numeracy and encourage reflection on and evaluation of alternative strategies. (EP 3.1, EP 3.2)
- Create opportunities for learners to mark their own and each other's work and encourage them to see and use errors as opportunities for further learning. (EP 3.1, EP 3.2)
- Facilitate learner reflection on the process of learning numeracy skills, knowledge and understanding, recognising that this may be unfamiliar in the context of numeracy. (EP 3.1, EP 3.2)

(This is guidance on extent. This particular guidance relates to subject knowledge and professional practice. The references are to statements in the professional standards.)

DOMAIN A: PROFESSIONAL VALUES AND PRACTICE

Mathematics (Numeracy) teachers in the lifelong learning sector value:

Standard AS 1
All learners, their progress and development, their learning goals and aspirations and the experience they bring to their learning

Element A1.Ma
Understand mathematics and numeracy learners' background, experiences, goals and aspirations.

Standard AS 2
Learning, its potential to benefit people emotionally, intellectually, socially and economically, and its contribution to community sustainability

Element A2.Ma
Promote the links between mathematics/numeracy development and other areas of development.

Standard AS 3
Equality, diversity and inclusion in relation to learners, the workforce, and the community

Element A3.Ma
Address particular diversity and inclusion issues relating to mathematics and numeracy learners.

Standard AS 4
Reflection and evaluation of their own practice and their continuing professional development as teachers

Element A4.Ma
Engage in professional development relating to international, national and local research relating to mathematics and numeracy.

Standard AS 5
Collaboration with other individuals, groups and/or organisations with a legitimate interest in the progress and development of learners

Element A5.Ma
Collaborate with others to develop learners' mathematics and numeracy in a whole range of settings and contexts.

Mathematics (Numeracy) teachers in the lifelong learning sector are committed to:

Standard AS 6
The application of agreed codes of practice and the maintenance of a safe environment

Informed by professional standards only

Standard AS 7
Improving the quality of their practice

Element A6.Ma
Use approaches which develop the quality of mathematics and numeracy learning and teaching across an organisation.

Mathematics (Numeracy) teachers in the lifelong learning sector are committed to:

DOMAIN B: LEARNING AND TEACHING

Standard BS 1
Maintaining an inclusive, equitable and motivating learning environment

Element B1.Ma
Recognise the effects of learner backgrounds on feelings about numeracy and mathematics and foster positive self images as independent mathematics/numeracy learners.

Element B2.Ma
Create an environment where learners feel valued as members of a numeracy community.

Standard BS 2
Applying and developing own professional skills to enable learners to achieve their goals

Element B3.Ma
Use subject knowledge to adopt appropriate approaches to mathematics and numeracy teaching.

Element B4.Ma
Use specialist pedagogical knowledge to adopt appropriate learning and teaching strategies for mathematics and numeracy.

Element B5.Ma
Employ specialist pedagogical knowledge to support a wide range of learners' needs in mathematics/numeracy.

Standard BS 3
Communicating effectively and appropriately with learners to enhance learning

Element B6.Ma
Enable learners to develop appropriate specialist mathematical/ numeracy language.

Element B7.Ma
Use a wide range of communication strategies to support conceptual understanding in mathematics and numeracy.

Element B8.Ma
Facilitate appropriate learner-teacher and learner-learner interaction in order to support learning in a numeracy context.

Standard BS 4
Collaboration with colleagues to support the needs of learners

Element B9.Ma
Work with teachers of other subjects where numeracy is embedded to identify relevant numeracy skills, and plan how to develop these in context.

Standard BS 5
Using a range of learning resources to support learners

Element B10.Ma
Use specialist knowledge and awareness of learner needs and goals to select, develop and use appropriate resources for mathematics/numeracy learning, including ICT where appropriate.

Mathematics (Numeracy) teachers in the lifelong learning sector are committed to:

DOMAIN C: SPECIALIST LEARNING AND TEACHING

Standard CS 1
Understanding and keeping up to date with current knowledge in respect of own specialist area

Element C1.Ma
Develop own knowledge and understanding of the development of mathematics across cultures and through time.

Element C2.Ma
Develop own knowledge and understanding of the language and concepts associated with place value systems.

Element C3.Ma
Develop own knowledge and understanding of the nature of argument and proof in mathematics.

Element C4.Ma
Develop own knowledge and understanding of how to critically gather, use, process, display and interpret data.

Element C5.Ma
Develop own knowledge and understanding of wide range of ways of defining or representing different concepts in mathematics and numeracy.

Element C6.Ma
Develop own knowledge and understanding of a range of common mathematics/numeracy learner errors and misconceptions, possible reasons why they occur and approaches for addressing them.

Element C7.Ma
Develop own knowledge and understanding of a wide range of mental, written and diagrammatic strategies for different calculations with numbers and spatial information.

Element C8.Ma
Develop own knowledge and understanding of the activities, processes and stages within mathematical problem solving/ investigation.

Element C9.Ma
Develop own knowledge and understanding of how the approach used for solving a mathematical/numeracy problem/investigation can be affected by its context or transfer between contexts.

Element C10.Ma
Develop own knowledge and understanding of a range of connections between areas in mathematics/numeracy.

Element C11.Ma
Develop an understanding of the origins and status of mathematical knowledge and the effect on mathematics curriculum development.

Element C12.Ma
Understand the roles of mathematics and numeracy in the world at large.

Standard CS 2
Enthusing and motivating learners in own specialist area

Element C13.Ma
Develop own knowledge and understanding of public/popular perceptions of mathematics/numeracy and consider their impact on learner motivation.

Element C14.Ma
Demonstrate specialist knowledge of appropriate strategies that engage and enthuse learners in numeracy and mathematics.

Standard CS 3
Fulfilling the statutory responsibilities associated with own specialist area of teaching

Element C15.Ma
Develop knowledge and understanding of a range of learning and teaching theories and strategies, relevant to numeracy and mathematics, in order to apply them to practice.

Element C16.Ma
Develop knowledge of the effects of learner backgrounds and needs on numeracy and mathematics learning.

Element C17.Ma
Use understanding of the different ways in which language and literacy skills are integral to learners' achievement, in numeracy and mathematics, to address the development of these skills within numeracy and mathematics.

Element C18.Ma
Use of communication to promote and develop conceptual understanding of mathematics via collaborative tasks and sharing of strategies.

Standard CS 4
Developing good practice in teaching own specialist area

Element C19.Ma
Use specialist organisations and publications to develop own practice as a Mathematics (Numeracy) teacher.

Element C20.Ma
Access subject specific training and development opportunities, using a reflective continuing professional development cycle to critically select such opportunities.

Mathematics (Numeracy) teachers in the lifelong learning sector are committed to:

DOMAIN D: PLANNING FOR LEARNING

Standard DS 1
Planning to promote equality, support diversity and to meet the aims and learning needs of learners

Element D1.Ma
Plan mathematics and numeracy-related course outlines and lessons to meet learner needs and curriculum requirements.

Element D2.Ma
Plan mathematics/numeracy learning and teaching that reflects diversity and promotes equality of opportunity.

Standard DS 2
Learner participation in the planning of learning

Element D3.Ma
Negotiate numeracy and mathematical goals related to assessment results and use these to inform planning.

Standard DS 3
Evaluation of own effectiveness in planning learning

Element D4.Ma
Employ strategies to evaluate mathematics/numeracy learning and teaching.

Mathematics (Numeracy) teachers in the lifelong learning sector are committed to:

DOMAIN E: ASSESSMENT FOR LEARNING

Standard ES 1
Designing and using assessment as a tool for learning and progression

Element E1.Ma
Develop knowledge of the types of skills, knowledge and understanding that can be assessed in mathematics and numeracy and use these to select or design appropriate assessment tools.

Standard ES 2
Assessing the work of learners in a fair and equitable manner

Element E2.Ma
Recognise that learners can have a wide variety of mathematical/numeracy skills, knowledge and understanding which does not necessarily conform to broad standards.

Element E3.Ma
Develop awareness of the differences that learner backgrounds can make with regard to approaches to mathematics and numeracy.

Standard ES 3
Learner involvement and shared responsibility in the assessment process

Element E4.Ma
Develop strategies to involve learners in their own numeracy/mathematics assessment.

Standard ES 4
Using feedback as a tool for learning and progression

Element E5.Ma
Apply specialist knowledge of assessment and feedback for mathematical/numeracy learning to develop learner skills, knowledge and understanding in the subject.

Standard ES 5
Working within the systems and quality requirements of the organisation in relation to assessment and monitoring of learner progress

Element E6.Ma
Record relevant information about the mathematical/numeracy skills, knowledge and understanding of learners in order to progress learning.

Mathematics (Numeracy) teachers in the lifelong learning sector are committed to:

DOMAIN F: ACCESS AND PROGRESSION

Standard FS 1
Encouraging learners to seek initial and further learning opportunities and to use services within the organisation

Element F1.Ma
Signpost numeracy and mathematics learners to subject specialist support services, learning and progression opportunities.

Standard FS 2
Providing support for learners within the boundaries of the teacher role

Element F2.Ma
Identify the boundaries between their own specialist areas and those of other specialists including literacy, ESOL, ICT and learning difficulties and disabilities.

Standard FS 3
Maintaining own professional knowledge in order to provide information on opportunities for progression in own specialist area

Element F3.Ma
Maintain professional knowledge relating to progression opportunities for mathematics and numeracy learners.

Standard FS 4
A multi-agency approach to supporting development and progression opportunities for learners

Element F4.Ma
Develop relationships with a range of specialist services, agencies and professionals for numeracy learners both within and outside the organisation.

Mathematics (Numeracy) teachers in the lifelong learning sector value:

DOMAIN A: PROFESSIONAL VALUES AND PRACTICE

Standard AS 1
All learners, their progress and development, their learning goals and aspirations and the experience they bring to their learning

Element A1.Ma
Understand mathematics and numeracy learners' background, experiences, goals and aspirations.
Mathematics (Numeracy) teachers know and understand:

- The second chance nature of adult numeracy learning and the impact of this on learners' perceptions of their chances of success and ability to work independently. (AK 1.1)
- Ways to identify the range of other skills, experiences and expertise that numeracy learners bring to their learning. (AK 1.1)
- Ways to identify the vocational and other subject areas which interest, motivate and inspire numeracy learners. (AK 1.1)

Mathematics (Numeracy) teachers:

- Apply their understanding of numeracy learners' backgrounds, experiences, goals and aspirations to supporting their development and progression. (AP 1.1)

Standard AS 2
Learning, its potential to benefit people emotionally, intellectually, socially and economically, and its contribution to community sustainability

Element A2.Ma
Promote the links between mathematics/numeracy development and other areas of development.
Mathematics (Numeracy) teachers know and understand:

- Ways to help numeracy learners identify the links between developing their numeracy skills and developing other areas of importance to them. (AK 2.1, AK 2.2)

Mathematics (Numeracy) teachers:

- Use opportunities with learners to highlight the links between developing numeracy skills and developing other areas of importance to them. (AP 2.1)
- Encourage numeracy learners to reflect on ways numeracy development can empower them as individuals and make a difference in their communities. (AP 2.2)

Standard AS 3
Equality, diversity and inclusion in relation to learners, the workforce, and the community

Element A3.Ma
Address particular diversity and inclusion issues relating to mathematics and numeracy learners.
Mathematics (Numeracy) teachers know and understand:

- The range and diversity of numeracy practices. (AK 3.1)
- The personal, social, cultural, economic and political factors which may affect the learning, development and progression of people with numeracy needs. (AK 3.1)

- The particular impact and implications of physical disabilities, sensory impairment and mental health issues for numeracy learners. (AK 3.1)
- Current definitions of dyslexia, dyscalculia and other related conditions, and strategies for supporting learners in numeracy settings. (AK 3.1)

Mathematics (Numeracy) teachers:

- Facilitate the development of numeracy learners' own numeracy practices. (AP 3.1)
- Demonstrate the skills needed to identify the particular learning and development needs of numeracy learners' which are due to personal, social, cultural, economic and political factors. (AP 3.1)
- Recognise the impact and implications of physical disabilities, sensory impairment and mental health issues for numeracy learners and use appropriate advice and referral strategies. (AP 3.1)
- Demonstrate understanding of current definitions of dyslexia, dyscalculia and other related conditions, and use strategies for supporting learners in numeracy settings. (AP 3.1)

Standard AS 4
Reflection and evaluation of their own practice and their continuing professional development as teachers

Element A4.Ma
Engage in professional development relating to international, national and local research relating to mathematics and numeracy.

Mathematics (Numeracy) teachers know and understand:

- How research into numeracy and mathematics, together with teachers' and learners' own insights, can inform learning and teaching and their own practice. (AK 4.3)
- The relationships between international, national and regional numeracy and mathematics policies and initiatives, learning and teaching and their own practice. (AK 4.3)

Standard AS 5
Collaboration with other individuals, groups and/or organisations with a legitimate interest in the progress and development of learners

Element A5.Ma
Collaborate with others to develop learners' mathematics and numeracy in a whole range of settings and contexts.

Mathematics (Numeracy) teachers:

- Collaborate with colleagues and/or others to enable cross-disciplinary approaches to numeracy development. (AP 5.1)
- Apply their numeracy specialist knowledge to collaboration with teachers of other subjects and professionals within and outside the organisation. (AP 5.1)
- Collaborate with mathematics/numeracy colleagues to enable improvements in the development of mathematics and numeracy learners. (AP 5.1)

Mathematics (Numeracy) teachers in the lifelong learning sector are committed to:

Informed by professional standards only

Standard AS 6
The application of agreed codes of practice and the maintenance of a safe environment

Element A6.Ma
Use approaches which develop the quality of mathematics and numeracy learning and teaching across an organisation.
Mathematics (Numeracy) teachers know and understand:

- How numeracy practices are situated within organisational policy, planning and implementation processes and practice. (AK 7.1)

Standard AS 7
Improving the quality of their practice

Mathematics (Numeracy) teachers:

- Evaluate their own contribution to the development of the organisation's policies and practices relating to numeracy practices. (AP 7.2)

Mathematics (Numeracy) teachers in the lifelong learning sector are committed to:

DOMAIN B: LEARNING AND TEACHING

Standard BS 1
Maintaining an inclusive, equitable and motivating learning environment

Element B1.Ma
Recognise the effects of learner backgrounds on feelings about numeracy and mathematics and foster positive self images as independent mathematics/numeracy learners.
Mathematics (Numeracy) teachers:

- Use strategies to overcome the effects of mathematics anxiety in learners. (BP 1.1)
- Value learners' existing strategies for using numeracy in their own lives and provide opportunities to build on this. (BP 1.1)
- Use strategies to encourage learner motivation, independence and aspirations, for example, self selection of tasks, opportunities to uncover facts for themselves, learner experimentation with and evaluation of different numeracy methods. (BP 1.3)

Standard BS 2
Applying and developing own professional skills to enable learners to achieve their goals

Element B2.Ma
Create an environment where learners feel valued as members of a numeracy community.
Mathematics (Numeracy) teachers:

- Recognise the possible effects of prior learning experiences of mathematics and facilitate a classroom culture where learners are confident about asking questions and discussing methods and solutions with other learners. (BP 1.2)
- Develop an ethos of mutual support and encouragement so that learners do not feel 'judged' by their peers in terms of their numeracy learning. (BP 1.2)
- Create an environment where learners are comfortable about making mistakes, and see these as an opportunity for further learning. (BP 1.3)
- Manage group tasks so that participants recognise that interacting with others can enhance numeracy learning and understanding. (BP 1.2)

Element B3.Ma
Use subject knowledge to adopt appropriate approaches to mathematics and numeracy teaching.
Mathematics (Numeracy) teachers:

- Employ appropriate approaches to numeracy concepts in order to meet specified learning outcomes and the needs of learners, for example, whether to present 50% as a proportion (50 out of every 100) or a fraction (½). (BP 2.1)
- Facilitate deeper understanding by learners of the connections within and between different areas of the numeracy curriculum. (BP 2.1)

Element B4.Ma
Use specialist pedagogical knowledge to adopt appropriate learning and teaching strategies for mathematics and numeracy.
Mathematics (Numeracy) teachers:

- Use learning and teaching strategies for numeracy that relate to curriculum requirements and learner needs, goals and contexts. Select these strategies on the basis of knowledge of subject specialist theories and research in mathematics and numeracy education, as well as own experience. (BP 2.1, BP 2.4, BP 2.6)
- Use learning and teaching strategies designed to engage and motivate numeracy learners recognising that some learners have previous negative experiences of mathematics education. (BP 2.2)
- Use learning and teaching strategies to promote learner independence in numeracy recognising that mathematics education is often perceived as teacher-centred. (BP 2.3)

Element B5.Ma
Employ specialist pedagogical knowledge to support a wide range of learners' needs in mathematics/numeracy.
Mathematics (Numeracy) teachers:

- Use specialist knowledge to differentiate and support numeracy learning and teaching activities in order to make them more accessible for some learners, for example, concrete experimentation, in order to develop conceptual understanding, in contrast with paper and pencil methods. (BP 2.3)
- Use specialist knowledge to extend numeracy activities for those learners who would benefit from developing their skills and understanding further, for example, using open ended tasks such as 'How many different ways are there to do this?'. (BP 2.3)
- Incorporate opportunities for learners to justify their statements and conclusions. (BP 2.3)
- Identify and use strategies for addressing individual needs in numeracy and engaging all learners to take a full part in sessions, for example, language and literacy needs, global and specific learning difficulties, physical disabilities or mental health issues. (BP 2.2, BP 2.4)

Standard BS 3
Communicating effectively and appropriately with learners to enhance learning

Element B6.Ma
Enable learners to develop appropriate specialist mathematical/ numeracy language.
Mathematics (Numeracy) teachers:

- Identify and use strategies for encouraging the active use of numeracy-related vocabulary by learners. (BP 3.1)
- Identify sources of linguistic confusion in numeracy and adopt strategies to address these where appropriate. (BP 3.1)

Element B7.Ma
Use a wide range of communication strategies to support conceptual understanding in mathematics and numeracy.
Mathematics (Numeracy) teachers:

- Use strategies such as discussion or question and answer to develop understanding of numeracy related topics, modifying language according to audience, employing techniques to address the fact that some learners may not have positive experiences of talking about mathematics and numeracy. (BP 3.2, BP 3.4)
- Facilitate deeper understanding by use of appropriate higher order questioning skills, for example, 'show me types' or 'how have you worked that out?'. (BP 3.2, BP 3.4)

- Use a wide range of non-verbal strategies to support conceptual understanding in numeracy, including the use of diagrammatic representation, animation, colour, realia (including data from internet sites), manipulatives, physical movement and multimedia approaches, for example, pacing to approximate measurements of a room, or animation in PowerPoint to indicate manipulation of simple formulas. (BP 3.1, BP 3.3)
- Use specialist knowledge to adapt written texts in numeracy contexts to appropriate levels, with minimum compromise of meaning or accuracy, including using multimedia, non-verbal communication or visual aids to support learner understanding. (BP 3.3)

Element B8.Ma
Facilitate appropriate learner-teacher and learner-learner interaction in order to support learning in a numeracy context.
Mathematics (Numeracy) teachers:

- Use skilfully framed open and closed, oral and written questions to elicit answers from which learners' numeracy understanding can be judged, and use this information to take learning forward. (BP 3.2, BP 3.4)
- Use a range of strategies to encourage collaborative learning of numeracy, where appropriate drawing on specialist research and/or resources in this area. (BP 3.5)
- Use tasks to promote discussion and develop the conceptual understanding and critical thinking skills of learners, for example, focusing on interpretation of data as well as extraction of numerical information. (BP 3.1)

Standard BS 4
Collaboration with colleagues to support the needs of learners

Element B9.Ma
Work with teachers of other subjects where numeracy is embedded to identify relevant numeracy skills, and plan how to develop these in context.
Mathematics (Numeracy) teachers:

- Design, adapt or select appropriate, authentic activities in collaboration with colleagues in vocational areas to introduce and develop the numeracy skills and knowledge needed in particular contexts. (BP 4.1)

Standard BS 5
Using a range of learning resources to support learners

Element B10.Ma

Use specialist knowledge and awareness of learner needs and goals to select, develop and use appropriate resources for mathematics/numeracy learning, including ICT where appropriate.

Mathematics (Numeracy) teachers:

- Design, adapt or select resources from an appropriate range that promote factual knowledge, develop conceptual understanding and/or enable practice of skills relating to numeracy, according to learner needs and goals. (BP 5.1, BP 5.4)
- Use ICT to create resources for numeracy and mathematics, recognising the issues related to communicating about mathematics/numeracy through ICT, for example, mathematical layouts in resource preparation and real time online communication of numeracy techniques. (BP 5.1)
- Use numeracy resources in a range of ways in order to meet planned learning outcomes, for example, using worksheet questions as part of a collaborative task, or splitting up a diagram into its component parts for learners to piece together. (BP 5.1)
- Select and use appropriate specialist equipment for numeracy learning and teaching, for example, measuring instruments, manipulatives, calculating aids, etc. (BP 5.1)
- Adapt the mathematical content of numeracy learning and teaching resources as appropriate for particular groups or individuals, either by simplification or extension. (BP 5.2)
- Use ICT and e-learning resources that link appropriately to numeracy learning outcomes and promote learner engagement with tasks and activities, for example, spreadsheets to record and process data, the ‘draw’ function in Word to investigate tessellation, software to model the ‘real world’ when solving problems and specialist numeracy software. (BP 5.1)

Mathematics (Numeracy) teachers in the lifelong learning sector are committed to:

Standard CS 1
Understanding and keeping up to date with current knowledge in respect of own specialist area

DOMAIN C: SPECIALIST LEARNING AND TEACHING

Element C1.Ma
Develop own knowledge and understanding of the development of mathematics across cultures and through time.
Mathematics (Numeracy) teachers know and understand:

- The outlines of number system development. (CK 1.1, CK 1.2)
- The outlines of measuring system development. (CK 1.1, CK 1.2)
- The outlines of recording and processing of data development. (CK 1.1, CK 1.2)

Element C2.Ma
Develop own knowledge and understanding of the language and concepts associated with place value systems.
Mathematics (Numeracy) teachers know and understand:

- Other number bases and conversion between bases. (CK 1.1)
- Simple calculations in other number bases. (CK 1.1)
- Standard form and its application to real world situations with associated language. (CK 1.1, CK 1.2)

Element C3.Ma
Develop own knowledge and understanding of the nature of argument and proof in mathematics.
Mathematics (Numeracy) teachers know and understand:

- The language of proof. (CK 1.1)
- Origins of proof in geometry. (CK 1.1)
- Role of algebra in generalising. (CK 1 .1)
- Use of generalised statements as a predictive/identifying mechanism in given situations. (CK 1.1)
- Potential benefits and concept of rearrangement. (CK 1.1)

Element C4.Ma
Develop own knowledge and understanding of how to critically gather, use, process, display and interpret data.
Mathematics (Numeracy) teachers know and understand:

- Design of data collection strategy. (CK 1.1, CK 1.2)
- Influence of sample size and data character. (CK 1.1, CK 1.2)
- Choice and use of data processing techniques. (CK 1 .1, CK 1.2)
- Rationale for choice of display type. (CK 1.1, CK 1.2)
- Representation and misrepresentation of data and its analysis. (CK 1.1, CK 1.2)

Element C5.Ma
Develop own knowledge and understanding of wide range of ways of defining or representing different concepts in mathematics and numeracy.
Mathematics (Numeracy) teachers know and understand:

- Multiple strategies for deducing and communicating individual concepts within mathematics up to and including NQF level 2 for mathematical curricula in frequent usage. (CK 1.1)
- Conceptual knowledge and understanding of sample areas of mathematics, suitable for target audience, at higher levels that can inform the development of mathematical understanding at NQF level 2 and below. (CK 1.1)

Element C6.Ma
Develop own knowledge and understanding of a range of common mathematics/numeracy learner errors and misconceptions, possible reasons why they occur and approaches for addressing them.
Mathematics (Numeracy) teachers know and understand:

- Common errors and misconceptions in mathematical concepts, processes and algorithms up to and including NQF level 2 for mathematical curricula in frequent usage across:
  - Number (CK 1.1)
  - Measure (CK 1.1)
  - Shape and space (CK 1.1)
  - Data-handling (CK 1.1)
  - Probability (CK 1.1)

Element C7.Ma
Develop own knowledge and understanding of a wide range of mental, written and diagrammatic strategies for different calculations with numbers and spatial information.
Mathematics (Numeracy) teachers know and understand:

- Wide ranging mental, written and diagrammatic strategies for calculations, including those relating to the 4 rules of number. (CK 1.1)
- Selection and use of such strategies. (CK 1.1)
- Metalanguage to describe and analyse strategies, including decomposition, partitioning, the commutative, associative and distributive laws. (CK 1.1)
- The implication of coping strategies and efficiency of calculation for future learning. (CK 1.1)

Element C8.Ma
Develop own knowledge and understanding of the activities, processes and stages within mathematical problem solving/ investigation.
Mathematics (Numeracy) teachers know and understand:
- Exploring (CK 1.1, CK 1.2)
- Generalising (CK 1.1, CK 1.2)
- Sorting (CK 1.1, CK 1.2)
- Hypothesising (CK 1.1, CK 1.2)
- Modelling (CK 1.1, CK 1.2)
- Measuring (CK 1.1, CK 1.2)
- Testing (CK 1.1, CK 1.2)
- Adjusting/remodelling (CK 1.1, CK 1.2)
- Reporting (CK 1.1, CK 1.2)
- Interpreting (CK 1.1, CK 1.2)

Element C9.Ma
Develop own knowledge and understanding of how the approach used for solving a mathematical/numeracy problem/ investigation can be affected by its context or transfer between contexts.
Mathematics (Numeracy) teachers know and understand:
- The role and implications of estimation and accuracy across the stages of calculation. (CK 1.1, CK 1.2)
- How the choice of mathematical methods may be influenced by context. (CK 1.1, CK 1.2)
- Use of shortcuts, diagrams, practical experimentation. (CK 1.1, CK 1.2)
- The interpretation and reporting of solutions. (CK 1.1, CK 1.2)

Element C10.Ma
Develop own knowledge and understanding of a range of connections between areas in mathematics/numeracy.
Mathematics (Numeracy) teachers know and understand:
(This is illustrative, not complete.)
- The use of number calculations in the analysis of data. (CK 1.1)
- The relationship between ratio and maps, plans and scale drawings. (CK 1.1)
- The link between measurement systems, number and place value. (CK 1.1)
- The role of algebra in the generalisation of number relationships and patterns. (CK 1.1)
- Graphical representation of algebraic relationships to support conceptual understanding and visualisation of solutions/trends. (CK 1.1)

Element C11.Ma
Develop an understanding of the origins and status of mathematical knowledge and the effect on mathematics curriculum development.

Mathematics (Numeracy) teachers know and understand:

- A range of notions of the words 'mathematics' and 'numeracy' including debates about their use such as whether numeracy is seen as a subset of maths or as 'more than maths'. (CK 1.1)
- The notions of 'context' and 'embedding' in relation to numeracy learning. (CK 1.1, CK 1.2)
- Debates around the origins and status of mathematical knowledge such as absolutist/fallibilist philosophies and their relationship to how mathematics/numeracy is taught. (CK 1.1)
- An outline of a range of national and international policy initiatives in mathematics and numeracy curriculum development. (CK 1.1)
- The relationship between views of mathematics/numeracy and curriculum development such as the introduction and subsequent removal of coursework for GCSE Mathematics, the context-free nature of the Adult Numeracy Core Curriculum and perceptions of the development of functionality in mathematics. (CK 1.1)
- The meaning of the terms 'multicultural mathematics' and 'ethnomathematics'. (CK 1.1)
- The impact of mathematics registers, for example, formal, scientific and street. (CK 1.1)

Standard CS 2
Enthusing and motivating learners in own specialist area

Element C12.Ma
Understand the roles of mathematics and numeracy in the world at large.

Mathematics (Numeracy) teachers know and understand:

- The position of mathematics in the education system and in wider society, for example, the images of mathematics in popular culture, the use of mathematics as a gatekeeper. (CK 1.2)
- Examples of the use of mathematics in personal life in a variety of circumstances and situations such as financial literacy, measurement in DIY, cooking and crafts, travel, the critical use of statistics. (CK 1.2)
- Examples of the use of mathematics/numeracy in a range of vocational and work-related contexts. (CK 1.2)
- Examples of the use of mathematics/numeracy in informing decision making such as the use of statistics in business or government initiatives. (CK 1.2)
- The types of effects that mathematical/numeracy skills, or lack thereof, have on employment, health, community participation and other aspects of life in society. (CK 1.2)

Element C13.Ma
Develop own knowledge and understanding of public/popular perceptions of mathematics/numeracy and consider their impact on learner motivation.
Mathematics (Numeracy) teachers know and understand:

- The nature of mathematics related anxiety in individuals. (CK 2.1)
- The range of motivations for learning numeracy including intrinsic and extrinsic examples and the relationship to wider views of mathematics/numeracy. (CK 2.1)

Element C14.Ma
Demonstrate specialist knowledge of appropriate strategies that engage and enthuse learners in numeracy and mathematics.
Mathematics (Numeracy) teachers know and understand:

- How to build confidence in numeracy learners, for example, valuing prior learning and experience, breaking down tasks into appropriate steps in order to create opportunities for success or by giving learners appropriate challenges. (CK 2.1)
- The value and use of both holistic and sequential approaches to problem solving in numeracy to address a variety of preferred ways of learning. (CK 2.1)
- The effects of teacher confidence and enthusiasm in overcoming possible stigma associated with mathematics and numeracy. (CK 2.1)
- How learner expectations of mathematics and its learning may be raised by actively responding to the embedding agenda and hence linking into wider motivations for success. (CK 2.1)

Standard CS 3
Fulfilling the statutory responsibilities associated with own specialist area of teaching

Element C15.Ma
Develop knowledge and understanding of a range of learning and teaching theories and strategies, relevant to numeracy and mathematics, in order to apply them to practice.
Mathematics (Numeracy) teachers know and understand:

- A wide range of ways in which generic learning and teaching and teaching techniques may be applied to the numeracy curriculum. (CK 3.1)
- Ways in which numeracy learning and teaching strategies, activities and resources may be analysed in terms of implied theories of learning. (CK 3.1)
- The rationale for using learner experience as a starting point for the development of numeracy skills, knowledge and understanding. (CK 3.1)
- Examples of theory and research related to the role of assessment in developing numeracy skills, knowledge and understanding. (CK 3.1, CK 3.2)

- A range of approaches to numeracy curriculum including the roles of deep and surface learning, inductive and deductive methods, global and analytic perspectives, process and product. (CK 3.1)
- The meaning of 'situated cognition' in mathematics and numeracy and related issues of knowledge transfer. (CK 3.1)
- The debates around what constitutes 'good' or 'effective practice' in mathematics and numeracy. (CK 3.1)
- The debates around models of learning styles and their application to numeracy learning. (CK 3.1)
- The rationale for providing opportunities to systematically explore understanding of key concepts and to expose, challenge and discuss common errors and misconceptions. (CK 3.1)
- The concepts of 'right' and 'wrong' in mathematics/numeracy and how these link with theories such as radical or social constructivism. (CK 3.1)
- A range of questioning techniques to facilitate the development of numeracy skills, knowledge and understanding. (CK 3.2)
- The use of rich collaborative tasks for the development of numeracy skills, knowledge and understanding and related theory, research and resources. (CK 3.1)
- The role of experiential problem solving in relevant practical situations to develop numeracy skills, knowledge and understanding and promote ownership of relevant learning. (CK 3.1)

Element C16.Ma
Develop knowledge of the effects of learner backgrounds and needs on numeracy and mathematics learning.
Mathematics (Numeracy) teachers know and understand:

- The possible effects of social background, gender, culture, age and personal circumstances on numeracy learning and a range of strategies for responding to these. (CK 3.2)
- The literature on personal learning histories and how these can affect learning in mathematics/numeracy. (CK 3.2)
- The possible effects of physical disabilities, mental health issues and learning difficulties on numeracy development and a range of strategies for responding to these. (CK 3.2)
- The complex relationship between dyslexia and mathematics/ numeracy development and related research. (CK 3.2)
- A range of strategies for supporting numeracy development in learners with dyslexia and other specific learning difficulties. (CK 3.2)
- The developing notions of dyscalculia, related research and strategies for responding to these. (CK 3.2)

Element C17.Ma
Use understanding of the different ways in which language and literacy skills are integral to learners' achievement, in numeracy and mathematics, to address the development of these skills within numeracy and mathematics.
Mathematics (Numeracy) teachers know and understand:

- How to communicate with appropriate mathematical language and vocabulary using recognised conventions, notation and terminology. (CK 3.3, CK 3.4)
- A range of literacy and language issues, and ways of addressing them, within numeracy, for example, that words may have a specific meaning in a mathematical context which is different from their everyday language meaning, for example, mean, range, similar, translation. (CK 3.3)
- A range of issues that can occur in numeracy learning when learners do not have English as a first language, or have literacy learning needs, and how to respond to these. (CK 3.3)

Element C18.Ma
Use of communication to promote and develop conceptual understanding of mathematics via collaborative tasks and sharing of strategies.
Mathematics (Numeracy) teachers know and understand:

- The integral character of communication and mathematical conceptualisation via use of:
  - Oral and written work. (CK 3.3)
  - Individual, small group and whole class work. (CK 3.3)
  - Teacher and learner interaction. (CK 3.3)
  - Peer support. (CK 3.3)

Standard CS 4
Developing good practice in teaching own specialist area

Element C19.Ma
Use specialist organisations and publications to develop own practice as a mathematics (numeracy) teacher.
Mathematics (Numeracy) teachers know and understand:

- How to access a range of organisations and mathematics/numeracy professional development resources, such as:
  - Regional support groups and networks. (CK 4.1)
  - Skills for Life and/or mathematics/numeracy networks - online or otherwise. (CK 4.1)
  - Mathematics and numeracy associations. (CK 4.1)
  - Mathematics/numeracy/Skills for Life journals and websites. (CK 4.1)

- National bodies with associated research and training and their publications and events, for example, the National Centre for Excellence in the Teaching of Mathematics (NCETM), NRDC, NIACE, BSA. (CK 4.1)
- (In)formal collaboration with specialist colleagues as a mechanism for professional development. (CK 4.1)
- National professional development initiatives. (CK 4.1)

Element C20.Ma
Access subject specific training and development opportunities, using a reflective continuing professional development cycle to critically select such opportunities.
Mathematics (Numeracy) teachers:

- Take up further opportunities to develop subject specific knowledge, subject specific pedagogical knowledge and associated practice through access to training, both accredited and non-accredited. (CP 4.1)
- Use reflective practice and research to inform their own knowledge of mathematics (numeracy) and its learning and teaching in both policy and practice. (CP 4.1)

DOMAIN D: PLANNING FOR LEARNING

Mathematics (Numeracy) teachers in the lifelong learning sector are committed to:

Standard DS 1
Planning to promote equality, support diversity and to meet the aims and learning needs of learners

Element D1.Ma
Plan mathematics and numeracy-related course outlines and lessons to meet learner needs and curriculum requirements.
Mathematics (Numeracy) teachers know and understand:

- Approaches to planning numeracy programmes, their rationales and critical selection, for example, 'spiral' learning (revisiting topics/ skills and making connections between different curriculum areas) or teaching through theme or context and integrating skills from a range of curriculum areas. (DK 1.1, DK 1.3)
- The range of current numeracy and maths standards and curricula applicable to the sector, including wide ranging contexts, from central such as the Adult Numeracy Core Curriculum to more targeted such as the application of the National Curriculum to support family learning. (DK 1.1)

- The difference between different types of learning objective in mathematics and numeracy, including those based on:
    - Mathematical techniques. (DK 1.2)
    - Problem solving. (DK 1.2)
    - Motor skills relevant to numeracy. (DK 1.2)
    - Conceptual understanding. (DK 1.2)
    - Mathematical vocabulary and language. (DK 1.2)
    - Attitudes to mathematics/numeracy and when it is appropriate to use what type. (DK 1.2)
- How to break down a numeracy aim into a set of achievable objectives. (DK 1.2)
- Issues related to the use of numeracy learning objectives, for example, numeracy learning beyond those measured by SMART objectives. (DK 1.2, DK 1.3)
- How analytical, evaluative and critical thinking skills can be applied to numeracy, (for example, discuss the reasons why an advertiser might choose to present their mathematical data in a particular format). (DK 1.1, DK 1.2)

Mathematics (Numeracy) teachers:

- Research and use learner aims and goals to plan numeracy programmes and sessions (for example, maths for electricians or maths to help children with homework), and balance individual needs against those of the group. (DP 1.2, DP 1.3)
- Plan appropriate schemes of work which clearly indicate connections within and between numeracy topics and skills, encourage progression, identify assessment opportunities and use a variety of activities to achieve different mathematical and other appropriate outcomes. (DP 1.1, DP 1.2, DP 1.3)
- Work with colleagues to plan contextualised schemes of work where numeracy is embedded. (DP 1 1, DP 1.2)
- Use relevant numeracy curricula as an aid to planning structured and coherent schemes of work and session plans, and to plan assessment at an appropriate level. (DP 1.1)
- Plan to use relevant overarching themes, where appropriate, to integrate numeracy skills and highlight connections between topics, justifying selections made. (DP 1.1)
- Plan to use differentiated activities that meet the individualised needs of learners. (DP 1.1)

- Set numeracy-related lesson objectives and design related activities that:
    - Reflect learner needs and curriculum requirements. (DP 1.1, DP 1.2, DP 1.3)
    - Break down longer term aims into achievable steps. (DP 1.1, DP 1.2, DP 1.3)
    - Develop higher order and/or critical thinking skills in numeracy. (DP 1.1, DP 1.2, DP 1.3)
    - Relate to understanding of mathematical concepts as well as the application and demonstration of skills and knowledge. (DP 1.1, DP 1.2, DP 1.3)
    - Develop the use of numeracy-related language and vocabulary as appropriate. (DP 1.1, DP 1.2, DP 1.3)
    - Anticipate questions from learners. (DP 1.1, DP 1.2, DP 1.3)
    - Promote the appropriate use of cognitive conflict. (DP 1.1, DP 1.2, DP 1.3)

Element D2.Ma
Plan mathematics/numeracy learning and teaching that reflects diversity and promotes equality of opportunity.
Mathematics (Numeracy) teachers know and understand:

- How to use different cultural approaches to numeracy appropriately in planning learning and teaching. (DK 1.1)
- How to use learner backgrounds such as interests, contexts and experiences to inform the planning of numeracy learning and teaching. (DK 1.1, DK 1.2)

Mathematics (Numeracy) teachers:

- Plan numeracy learning and teaching that takes account of the backgrounds, needs and goals of learners, recognising that this approach may challenge some perceptions of mathematics education. (DP 1.1, DP 1.2)
- Anticipate the particular requirements of learners with physical disabilities, mental health issues and learning difficulties with respect to numeracy learning, to support appropriate response to their learning needs. (DP 1.1)
- Plan learning and teaching activities that encourage learners to value mathematics/numeracy as a social activity that has developed across time and cultures. (DP 1.1)

Standard DS 2
Learner participation in the planning of learning

Element D3.Ma
Negotiate numeracy and mathematical goals related to assessment results and use these to inform planning.
Mathematics (Numeracy) teachers know and understand:

- A range of issues related to balancing numeracy curriculum requirements and individual learner goals, and how to negotiate these with learners, for example, using the learner's own words while mapping goals against numeracy curriculum elements, breaking down longer term aims into achievable numeracy goals, addressing a range of goals in planning numeracy teaching and learning. (DK 2.1, DK 2.2)

Mathematics (Numeracy) teachers:

- Agree relevant numeracy-related goals with learners based on personal aims, assessment results and curriculum requirements. (DP 2.1, DP 2.2)
- Select appropriate strategies for supporting a range of needs within a numeracy group. (DP 2.2)
- Use information about existing numeracy skills, experience, personal contexts and goals of learners, as well as their learning needs and concerns about numeracy, on an ongoing basis when planning teaching and learning. (BP 2.5, DP 2.1, DP 2.2)

Standard DS 3
Evaluation of own effectiveness in planning learning

Element D4.Ma
Employ strategies to evaluate mathematics/numeracy learning and teaching.
Mathematics (Numeracy) teachers know and understand:

- How to evaluate and analyse numeracy activities from theoretical perspectives as well as practical ones, with reference to appropriate general and mathematics-related learning theories. (BP 2.6, DK 3.1, DK 3.2)

Mathematics (Numeracy) teachers:

- Use learner reflection and feedback on numeracy activities to evaluate learning and teaching, recognising the role of learner feelings about mathematics/numeracy in informing how learning and teaching is planned. (BP 2.6, DP 3.1, DP 3.2)
- Evaluate learning and teaching activities for numeracy in a range of ways, for example, in terms of what was learned, and use this to inform the planning of further teaching, learning and assessment activities. (BP 2.6, DP 3.1, DP 3.2)

Mathematics (Numeracy) teachers in the lifelong learning sector are committed to:

Standard ES 1
Designing and using assessment as a tool for learning and progression

DOMAIN E: ASSESSMENT FOR LEARNING

Element E1.Ma
Develop knowledge of the types of skills, knowledge and understanding that can be assessed in mathematics and numeracy and use these to select or design appropriate assessment tools.

Mathematics (Numeracy) teachers know and understand:

- The different types of skills, knowledge and understanding that can be assessed in numeracy across the cognitive, affective and psychomotor domains, including mental/written, product/process, contextualised/discrete, atomised skills/holistic approaches, understanding, articulation of understanding, recall of facts and knowledge, problem-solving, application and transferability of skills to and between contexts. (EK 1.1)
- That numeracy skills, knowledge and understanding can vary over time for individual learners if they are not used regularly, and that this can affect assessment results. (EK 1.1)
- That assessment in numeracy can include information about the whole learner, including previous learning experiences, personal contexts and goals, and ways in which this can feed into planning for numeracy learning and teaching. (EK 1.1)
- The different types of methods of assessment that can be used in numeracy and their suitability for what is being assessed and for what purpose, including mathematical investigation, portfolio assignments, observation of tasks, use of questioning techniques, closed answer or multiple choice tests, written/oral/practical assessments, formal/informal techniques, etc. (EK 1.2, EK 1.3)
- How the character and purpose of assessment, such as initial, diagnostic, formative or summative influences the nature of numeracy assessment activities. (EK 1.1)

Mathematics (Numeracy) teachers:

- Select, design, adapt and use assessment tools that are appropriate to the mathematical purpose of the assessment, and take into account learner backgrounds, where appropriate. (EP 1.2, EP 1.3)
- Evaluate assessment tools on the basis of relevant principles and theories of assessment in mathematics/numeracy. (EP 1.1)

Standard ES 2
Assessing the work of learners in a fair and equitable manner

Element E2.Ma
Recognise that learners can have a wide variety of mathematical/numeracy skills, knowledge and understanding which does not necessarily conform to broad standards.
Mathematics (Numeracy) teachers know and understand:

- That proficiency across types of skills, knowledge and understanding or areas of the numeracy curriculum is not necessarily uniform in individuals. (EK 2.1, EK 2.3)

Mathematics (Numeracy) teachers:

- Assess learners across a range of types of skills, knowledge and understanding in numeracy (for example, problem-solving, mental approaches or measuring skills, as well as recall of multiplication facts) in order to ascertain what learners can do as well as what they cannot do. (EP 2.1, EP 2.2, EP 2.3)

Element E3.Ma
Develop awareness of the differences that learner backgrounds can make with regard to approaches to mathematics and numeracy.
Mathematics (Numeracy) teachers know and understand:

- The nature of a range of cultural differences to approaches to mathematics/numeracy. (EK 2.1, EK 2.2)
- The types of issues that learners with physical disabilities, mental health issues and learning difficulties can have with assessment in numeracy. (EK 2.1, EK 2.2)
- The range of possible responses that learners can have to assessment in numeracy, based on previous mathematics-related learning experiences and perceptions of mathematics/numeracy in society. (EK 2.1, EK 2.2)

Mathematics (Numeracy) teachers:

- Evaluate numeracy assessment tools for accessibility according to what is being assessed, for example, whether a test that requires a calculation to be completed by a particular technique is fit for purpose, or the equity of questions that assume knowledge of culturally specific objects or information. (EP 2.1, EP 2.4)
- Use specialist knowledge to adapt numeracy assessment tools and processes in order to make them more accessible to learners, without compromising what is being assessed. Examples include using discussion and self-assessment activities at the beginning of a programme instead of a formal written test to cater for learners who have previous negative experiences of testing in mathematics and knowing when to use a problem contextualised to a familiar situation to assess a mathematical skill. (EP 2.1, EP 2.4)

Standard ES 3
Learner involvement and shared responsibility in the assessment process

Element E4.Ma
Develop strategies to involve learners in their own numeracy/ mathematics assessment.

Mathematics (Numeracy) teachers know and understand:

- That previous learning experiences and views of mathematics can affect learner perceptions of teacher and learner roles in the numeracy learning environment. (EK 3.1, EK 3.2)
- The role of meta-cognition in mathematics/numeracy learning. (EK 3.1)

Mathematics (Numeracy) teachers:

- Encourage learners to use a range of self-checking strategies in numeracy, for example, inverse operations, estimation, alternative methods of calculation. (EP 3.1, EP 3.2)
- Value learner methods of problem solving in numeracy and encourage reflection on and evaluation of alternative strategies. (EP 3.1, EP 3.2)
- Create opportunities for learners to mark their own and each other's work and encourage them to see and use errors as opportunities for further learning. (EP 3.1, EP 3.2)
- Facilitate learner reflection on the process of learning numeracy skills, knowledge and understanding, recognising that this may be unfamiliar in the context of numeracy. (EP3.1, EP 3.2)

Standard ES 4
Using feedback as a tool for learning and progression

Element E5.Ma
Apply specialist knowledge of assessment and feedback for mathematical/numeracy learning to develop learner skills, knowledge and understanding in the subject.

Mathematics (Numeracy) teachers know and understand:

- How to interpret the wider results of assessment in numeracy, considering understanding of concepts and methods not just achievement, for example, that getting the 'correct' answer may not always be due to using the 'correct' method, that getting the 'wrong' answer may be for a number of reasons. (EK 4.1)

Mathematics (Numeracy) teachers:

- Use feedback on assessment information about learner understanding, including errors and misconceptions, to continually inform further learning in numeracy, both in-situ and in further planning. (EP 4.1)
- Routinely use a range of informal assessment methods, such as questioning techniques, to further diagnose learner skills, knowledge and understanding in a particular area of numeracy, for example, asking learners to explain their methods after solving a problem, or posing questions that lead to cognitive conflict in order to expose misconceptions. (EP 4.1)

Standard ES 5
Working within the systems and quality requirements of the organisation in relation to assessment and monitoring of learner progress

Element E6.Ma
Record relevant information about the mathematical/numeracy skills, knowledge and understanding of learners in order to progress learning.
Mathematics (Numeracy) teachers know and understand:

- A range of issues related to recording learner progress in numeracy, such as the level of detail regarding mathematical skills, knowledge and understanding, the balance of process and product, how to record attitudes to and feelings about learning numeracy, how to evidence development in numeracy-related motor-skills (for example, measuring, drawing graphs), how to document the extent to which the learner is able to transfer skills from one context to another. (BK 3.5, EK 5.1, EK 5.2, EK 5.3)

Mathematics (Numeracy) teachers:

- Develop systems for recording learner progress in numeracy that take into account the complex nature of numeracy learning and that inform the learner, the teacher and the institution. (BP 3.5, EP 5.1, EP 5.2, EP 5.3)

Mathematics (Numeracy) teachers in the lifelong learning sector are committed to:

DOMAIN F: ACCESS AND PROGRESSION

Standard FS 1
Encouraging learners to seek initial and further learning opportunities and to use services within the organisation

Element F1.Ma
Signpost numeracy and mathematics learners to subject specialist support services, learning and progression opportunities.
Mathematics (Numeracy) teachers know and understand:

- Where to find sources of specialist information, advice and guidance relating to numeracy. (FK 1.1)
- The specialist numeracy support and development services and opportunities offered by the organisation. (FK 1.1)
- How to help learners develop the numeracy skills needed to research, access and use the organisation's services and those outside the organisation. (FK 1.1, FK 1.2)
- Statutory entitlements to learning and personal support for numeracy, literacy and ESOL learners, along with the procedures in place for their implementation. (FK 1.2)

Mathematics (Numeracy) teachers:

- Offer specialist numeracy information and advice and guidance. (FP 1.1)
- Provide numeracy learners with the information they need about the organisation and its facilities, services and opportunities which support the development of numeracy confidence and competence. (FP 1.2)
- Enable numeracy learners to develop the research skills they need to access and use the organisation's services and those outside the organisation. (FP 1.2)

Standard FS 2
Providing support for learners within the boundaries of the teacher role

Element F2.Ma
Identify the boundaries between their own specialist areas and those of other specialists including literacy, ESOL, ICT and learning difficulties and disabilities.

Mathematics (Numeracy) teachers know and understand:

- The boundaries between the specialist advice and support that numeracy teachers give, the specialist advice and support which involves learning difficulties and disabilities specialists and the specialist advice, support, guidance and counselling which involves specialists from other professional areas. (FK 2.1)
- Developments within the numeracy learning and teaching profession, and also those relating to the fields of literacy, ESOL, ICT and learning difficulties and disabilities. (FK 3.1)

Standard FS 3
Maintaining own professional knowledge in order to provide information on opportunities for progression in own specialist area

Element F3.Ma
Maintain professional knowledge in relation to progression opportunities for mathematics and numeracy learners.

Mathematics (Numeracy) teachers know and understand:

- The importance of numeracy in relation to learners' current situation and opportunities for further progression into education, training and/or career. (FK 3.1)

Mathematics (Numeracy) teachers:

- Use professional subject knowledge to provide information to learners on the place of numeracy in potential progression routes for education, training and/or career. (FP 3.1)

Standard FS 4
A multi-agency approach to supporting development and progression opportunities for learners

Element F4.Ma
Develop relationships with a range of specialist services, agencies and professionals for numeracy learners both within and outside the organisation.

Mathematics (Numeracy) teachers know and understand:

- A wide range of national, regional and local support services available to numeracy learners to support development and progression. (FK 4.1)
- The specialists from other areas, both within and outside the organisation, which particularly support numeracy learners, and also those which support literacy and ESOL learners and learners with learning difficulties and disabilities. (FK 4.1, FK 4.2)

Mathematics (Numeracy) teachers:

- Work collaboratively with specialists from other areas, both within and outside the organisation, which particularly support numeracy learners, and also those which support literacy and ESOL learners and learners with learning difficulties and disabilities. (FP 4.1, FP 4.2)

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