



Teaching Functional Skills Mathematics

(Fully taught version)

**Accreditation guide for Ascentis level 5 unit
January 2019**

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Introduction

In 2018, the Education and Training Foundation (ETF) commissioned the development of full course materials to support the delivery of two new level 5 modules to support the introduction of reformed Functional Skills mathematics and English qualifications from September 2019. It is intended that the modules can be used either as freestanding CPD courses, or offered as optional units within the Diploma in Education and Training.

This course is designed to ensure that those responsible for teaching Functional Skills Mathematics are conversant with the new subject content and effective teaching practice, and have the confidence to teach Functional Mathematics to learners with skills below Level 2 and support their achievement.

The course materials have been written to support two modes of delivery:

- Traditional face-to-face (over 10 x ½ day session, or 5 x full days)
- Blended learning (3 x full days face-to-face, plus 3 x 1.5hr webinars and online distance learning tasks)

This accreditation guide has been written to support those studying for accreditation of the **face-to-face** course.

Learning aims

On completion of the course, participants will be able to:

- Motivate and engage reluctant learners and address barriers to maths learning
- Plan teaching and learning in accordance with the new subject content for Functional Skills Mathematics
- Use active approaches to developing learners' skills in:
 - Using numbers and the number system
 - Using measures, shape and space
 - Handling information and data
- Contextualise and apply maths to vocational learning and meaningful everyday situations
- Develop learners' problem-solving and decision-making skills
- Use assessment for learning approaches to support Functional Mathematics
- Prepare learners for the requirements of summative assessment

Target audience

- Existing teachers and trainers who currently teach Functional Skills Mathematics and would benefit from training & development.
- Staff who are new to teaching Functional Skills Mathematics – including vocational practitioners.
- Teachers and trainers from across the sector, including work-based learning, adult & community education, prison education and FE colleges.

Suggested entry requirements

Applicants should:

- Hold a maths qualification at level 2 or above
- Be employed in a teaching/training/assessing role in the post-16 education & training sector
- Be involved in the delivery of Functional Skills Mathematics (or due to deliver imminently)
- Have support for their application from their manager, who should agree to release them to attend all sessions

Course website

All course materials and links to suggested reading and websites can be accessed via the course website:

https://warwick.ac.uk/study/cll/courses/professionaldevelopment/wmcett/resources/maths_level_5_resources/ (NB You will need to obtain the password from your course tutor, or contact j.chamberlain@warwick.ac.uk)

Course content

Session	Title	Session content
1	Starting points	<ul style="list-style-type: none"> • Introduction to the course • The Functional Skills Maths learner journey • Approaches to initial & diagnostic assessment • Use of maths histories • Barriers to engagement • Developing self-belief & growth mindsets
2	Keeping it real	<ul style="list-style-type: none"> • Changes to Functional Mathematics & the new 2018 subject content • Identifying personal skills development needs • Links between maths and vocational/everyday contexts • Use of 'Fermi' questions to promote realistic maths questions
3	Developing number skills & number sense	<ul style="list-style-type: none"> • <i>Whole numbers</i> in the new Functional Maths subject content • Number sense & relational understanding • Different methods of calculation • Activities to develop number sense & fluency
4	Fractions, decimals & percentages	<ul style="list-style-type: none"> • Fraction, decimals & related number concepts in the Functional Maths subject content • Analysing mistakes & misconceptions • Conceptual understanding of fractions & decimals • Using bar modelling & ratio tables to solve percentage & proportion problems
5	Addressing language needs & SEND	<ul style="list-style-type: none"> • Language barriers to maths learning • Strategies to support language needs • Role of small group work & discussion • Hidden learning difficulties & maths learning • Strategies to support SEND
6	Measures, shape & space	<ul style="list-style-type: none"> • Measures, shape & space (MSS) in the Functional Skills Maths subject content • Identifying core knowledge & skills to progress in MSS • The role of estimation & practical measurement • Activities to develop skills in MSS • Designing authentic activities for MSS
7	Problem solving	<ul style="list-style-type: none"> • The role of problem solving in the new Functional Skills Maths subject content • Analysing reasons for difficulties with problem solving • Approaches to developing & supporting problem solving • Use of coaching techniques • Activities that allow learners to 'build the problem'
8	Handling information & data	<ul style="list-style-type: none"> • Handling data in the Functional Skills Maths subject content • Common errors & misconceptions with data handling • Activities to develop data handling skills • Use of real-life data to develop activities • Opportunities to develop data handling in different contexts

Session	Title	Session content
9	Preparing for summative assessment	<ul style="list-style-type: none"> • Common mistakes in Functional Maths exams • Strategies to help learners interpret Functional Skills Maths questions • Working with exam papers • Supporting learners to explain & justify their reasoning • Planning a Functional Skills Maths activity
10	Putting it all together	<ul style="list-style-type: none"> • Peer presentation & evaluation of maths activities • Reflections on personal learning & areas for further development • Course evaluation

Assessment tasks

a) Meeting the needs of learners (1000-1500 words)

Present case studies of two of your learners. You should choose two learners who differ significantly in their backgrounds and needs in order to demonstrate the breadth of your knowledge and understanding. Each case study should include:

- The learner's background, interests and aspirations, and the context in which they are studying maths
- Details of the learner's maths learning needs, and how these were assessed
- The learner's past experiences and attitudes to maths, including any barriers to maths learning, and strategies you have used to motivate and engage them
- Details of how you have planned to meet the learner's needs within the subject content and summative assessment requirements of Functional Skills Mathematics. This should include details and examples of how you have adapted your approaches and resources to the learner's needs.
- An analysis of the progress made by the learner to date, including any areas requiring further development/practice.
- A self-evaluation of the effectiveness of the approaches and activities you have used, with recommendations for your future practice.

Your case study should seek to link theory and research with practice and include a justification of the decisions you made, with reference to background reading and ideas introduced during the course. Harvard referencing should be used to reference your work.

Where appropriate, attach source documents as appendices and refer to these in the body of your assignment; e.g. results of assessments, individual learning plans, lesson plans, examples of activities/resources used or adapted, examples of the learner's work, etc. All documents should be anonymised, with any information which might identify the learner removed. Note that appendices do **not** contribute to the overall word count.

(Assessment criteria 1.1, 1.2, 1.3, 2.1, 2.2, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4, 5.1, 5.2)

b) Approaches and activities for teaching Functional Mathematics (1000-1500 words)

Analyse different approaches to teaching and learning Functional Skills Mathematics, drawing on recent ideas and research, and providing examples of the application of these approaches in your practice.

You should:

- Discuss some of the key ideas and research concerning approaches to maths learning that are relevant to Functional Skills. Your discussion should be both descriptive and analytical.
- Provide examples of activities and resources that you have used, created or adapted to illustrate the approaches discussed.
- Evaluate the use of these different approaches, activities and resources within your own teaching context, and make recommendations for your future practice.

You should include reference to background reading to support your ideas and analysis, using Harvard referencing.

Examples of resources and activities used should be attached as appendices, as appropriate, and referred to in the body of your assignment. Note that appendices do **not** contribute to the overall word count.

(Assessment criteria 1.3, 2.1, 2.2, 3.1, 3.2, 4.1, 4.2, 4.3, 5.1, 5.2)

c) Reflective diary and action plan (500-750 words)

Keep a reflective diary for the duration of the course and update it at regular intervals.

The diary should include:

- A self-assessment against the ETF Professional Standards
- A self-assessment of your own personal maths skills
- Regular reflections on key learning points during the course, and planned changes to practice resulting from these
- An end-of-course action plan, detailing personal targets to develop:
 - Teaching, learning and assessment of Functional Skills Mathematics
 - Personal maths skills

(Assessment criteria 5.1, 5.2, 5.3)

How will I be assessed?

The assessment is designed to cover all the Ascentis assessment criteria; these criteria have been conflated into coherent assessment tasks in order to avoid assessment over-load.

All work submitted is expected to be your own work.

All assessment tasks must be passed. Assessment tasks will be marked on a pass/fail basis. Work which is not of the required standard for a pass will be referred and you will have one opportunity to amend and resubmit the work.

Presenting your work

- All assignments must be word processed and will usually be submitted electronically. You must always save your work in MS Word format. Scanned documents should be saved in pdf format.
- Do not use fancy fonts or colours. There is no place for these in academic work unless you are specifically asked or recommended to do so or you use them in graphs or diagrams. Recommended fonts are Arial, Calibri or Times New Roman.
- Set text spacing to 1.5 lines and font size to 12pt.
- Pages should be numbered throughout, as should diagrams, tables etc. These should be listed in a separate index after a contents page. Pages should be numbered at the bottom.
- If you use acronyms, the first time you include them, write them out in full, e.g. 'It is well known that the Education and Training Foundation', place the initials in brackets after this and then use the initials only thereafter. Then later in your essay, you can just say.... 'Recent news from the ETF'.
- Abbreviations should always be those in normal use: e.g., for example.
- Care must be taken to ensure correct spelling and grammar. This will be taken into consideration when work is marked, as will presentation of work.
- Always honour confidentiality and anonymity about your learners in your work.
- At Level 5 you are expected to use a variety of literature to support your points. These should be referenced using the Harvard Referencing system. You are required to acknowledge the author of each source within the text and in a references list at the end of the assignment. The references list is not included in the word count for the assignment.
- The total word count for your assignment (excluding the references list) must be within 10% of the stated word count.

Links to suggested reading

Here are further sources for reading, videos and weblinks to support your development on the course and to assist you in preparing for accreditation.

General reading

Askew, M. et al (1997) *Effective Teachers of Numeracy in Primary Schools: Teachers' Beliefs, Practices and Pupils' Learning*. Paper presented at the British Educational Research Association Annual Conference: University of York. [available at: <http://www.leeds.ac.uk/educol/documents/000000385.htm>]

Education & Training Foundation (2015) *Making maths & English work for all*. London: ETF [available at: https://www.et-foundation.co.uk/wp-content/uploads/2015/04/Making-maths-and-English-work-for-all-25_03_2015002.pdf]

NCETM (2008) *Mathematics Matters: Final Report*. London: NCETM [available at: <https://www.ncetm.org.uk/resources/12491>]

OFSTED (2006) *Evaluating mathematics provision for 14-19-year-olds*. London: Ofsted [available at: http://mei.org.uk/files/pdf/Evaluating_Mathematics_Provision.pdf]

OFSTED (2008) *Mathematics: understanding the score*. London: Ofsted [available at: <https://www.stem.org.uk/resources/elibrary/resource/31194/mathematics-understanding-score>]

The Research Base (2014) *Effective Practices in Post-16 Vocational Maths – Final Report*. Education & Training Foundation: London. [available at: <https://www.et-foundation.co.uk/wp-content/uploads/2014/12/Effective-Practices-in-Post-16-Vocational-Maths-v4-0.pdf>]

Skemp, R.R. (1978) *Relational Understanding and Instrumental Understanding* in 'The Arithmetic Teacher', Vol. 26, No. 3 (November 1978), pp. 9-15 [available at: <http://www.msurbanstem.org/teamone/wp-content/uploads/2014/07/Skemp-Relational-Instrumental-clean-copy-AT-1978.pdf>]

Swan, M. (2005) *Improving Learning in Mathematics: Challenges and Strategies*. DfES: London [available at: https://www.ncetm.org.uk/files/224/improving_learning_in_mathematicsi.pdf]

Reference sources

Basic Skills Agency (2001) *Adult numeracy core curriculum*. Basic Skills Agency: London. [available at: <https://funmathscpd.files.wordpress.com/2017/02/adult-numeracy-core-curriculum.pdf>]

DfE (2018) *Subject content: functional skills: mathematics*. London: DfE [available from: <https://www.gov.uk/government/publications/functional-skills-subject-content-mathematics>]

Education & Training Foundation (2014) *Professional Standards for Teachers and Trainers in Education and Training – England*. [Available at: <https://www.et-foundation.co.uk/supporting/support-practitioners/professional-standards>]

Education & Training Foundation (no date) *Foundation Online Learning: Maths Pathways* [Online: <https://www.foundationonline.org.uk/course/index.php?categoryid=19>]

Mathematics Glossary (no date) [Online. Available at: http://www.emaths.co.uk/index.php?option=com_zoo&view=item&layout=item&Itemid=513]

Ofqual (2018) *Functional Skills Mathematics Conditions & Requirements*. Coventry: Ofqual [available at: <https://www.gov.uk/government/publications/functional-skills-mathematics-conditions-and-requirements>]

Specific topics:

a) Assessment for learning (inc. initial & diagnostic assessment and misconceptions)

Black, P. and Wiliam, D. (1998) *Inside the black box: raising standards through classroom assessment*. London: King's College London School of Education [available at: <https://weaeducation.typepad.co.uk/files/blackbox-1.pdf>]

Education & Training Foundation (no date). *Assessment for Learning: Effective Practice Guidelines* [Online. Available at: <https://www.et-foundation.co.uk/supporting/support-practitioners/effective-practice-guidelines>]

Hodgen, J., Coben, D. & Rhodes, V. (2010) *Feedback, talk & engaging with learners: Formative assessment in adult numeracy*. London: NRDC. [available at: https://dera.ioe.ac.uk/21955/1/doc_4713.pdf]

Hodgen, J. and William, D. (2006) *Mathematics inside the black box*. London: GL Assessment. [available at: https://funmathscpd.files.wordpress.com/2017/02/mathematics_blackbox_hodgen_william_2006.pdf]

b) Contextualising maths to vocational & everyday life

Casey, H. (2006) *You wouldn't expect a maths teacher to teach plastering...: embedding literacy, language and numeracy in post-16 vocational programmes: the impact on learning and achievement*. NRDC: London. [available at: <http://www.nrdc.org.uk/?p=429>]

Ness, C and Bouch, D (2007) *Maths4Life: topic-based teaching*. London: NRDC. [available at: https://www.ncetm.org.uk/public/files/257645/topic-based_teaching.pdf]

Swain, J, Baker, E, Holder, D, Newmarch, B and Coben D (2005) '*Beyond the daily application*': making numeracy teaching meaningful to adult learners. London: NRDC [available at: https://dera.ioe.ac.uk/22321/1/doc_2977.pdf]

c) Fractions

McLeod, R and Newmarch, B (2006) *Maths4Life: Fractions*. London: NRDC [available from: <http://www.nrdc.org.uk/?p=282>]

d) Handling information & data

Gapminder [Online: <https://www.gapminder.org>]

Office for National Statistics. [Online: <https://www.ons.gov.uk>]

Guardian Datablog. [Online: <https://www.theguardian.com/data>]

e) Language & maths

NCETM (no date). *Top Tips for Teaching Numeracy to ESOL Learners* [available from: https://www.ncetm.org.uk/public/files/340591/Action_Research_Project_Leicestershire_ALS_Top_Tips.pdf]

f) Measures, shape & space

Bouch, D. & Ness, C. (2007) *Maths4Life: Measurement*. London: NRDC [available at: <http://www.nrdc.org.uk/?p=284>]

Ness, C. & Bouch, D. (2007) *Maths4Life: Time & Money*. London: NRDC [available at: <http://www.nrdc.org.uk/?p=296>]

g) Mindsets, attitudes & maths anxiety

Ashcroft, M. and Krause, J.A. (2007) *Working memory, math performance and math anxiety* in *Psychometric Bulletin & Review*, 2007, 14 (2), 243-248 [available at: http://www.fi.uu.nl/publicaties/literatuur/2007_ashcraft_psychonomic_bulletin.pdf]

Dweck, C (2008) *Mindsets and Math/Science Achievement*. Carnegie Corporation of New York. [available at: https://www.nd.gov/dpi/uploads/1381/mindset_and_math_science_achievement_nov_2013.pdf]

Nardi, E. and Steward, S. (2003) *Is Mathematics T.I.R.E.D? A Profile of Quiet Disaffection in the Secondary Mathematics Classroom*. *British Educational Research Journal*, Vol. 29, No. 3, 2003 [available at: <https://eclass.uoa.gr/modules/document/file.php/MATH103/ELENA%20NARDI/NARDI3.pdf>]

National Numeracy (no date) *Attitudes Towards Maths: Research & Approach Overview*. National Numeracy [available at: https://www.nationalnumeracy.org.uk/sites/default/files/attitudes_towards_maths_-_updated_branding.pdf]

Johnston-Wilder, S.; Lee, C.; Garton, L.; Goodlad, S. and Brindley, J. (2013) 'Developing coaches for mathematical resilience'. In: *2013 ICERI 2013 : 6th International Conference on Education, Research and Innovation, 18-20 November 2013, Seville, Spain*. [available at: https://www.academia.edu/4835024/Developing_Coaches_for_Mathematical_Resilience_-_ICERI_paper]

Lee, C. and Johnston-Wilder, S. (undated) *The Construct of Mathematical Resilience* [Online. Available at: <http://mathsisok.com/wp-content/uploads/2016/11/The-construct-mathematical-resilience.pdf>]

Youcubed: Growth mindset resources [online. Available at: <https://www.youcubed.org/resource/growth-mindset/>]

h) Number skills & number sense

Boaler, J and Williams, C (2015) *Fluency Without Fear: Research Evidence on the Best Ways to Learn Maths Facts*. Stanford University: Youcubed [available at: <https://bhi61nm2cr3mkgk1dtaov18-wpengine.netdna-ssl.com/wp-content/uploads/2017/03/FluencyWithoutFear-2015-1.pdf>]

Newmarch, B and Part, T (2007) *Maths4Life: Number*. London: NRDC [available at: <http://www.nrdc.org.uk/?p=286>]

Newmarch, B, Rhodes, V and Coben, D (2007) 'Bestimation': *Using basic calculators in the numeracy classroom*. London: NRDC [available at: <http://www.nrdc.org.uk/?p=163>]

i) Problem solving

Bowland Maths [Online: <http://www.bowlandmaths.org.uk>]

NRICH – Problem solving [Online: <https://nrich.maths.org/10334>]

j) Special Educational Needs & Disability (SEND)

Adler, B. (2001) *What is Dyscalculia?* Cognitive Centre in Sweden [available at: https://funmathscpd.files.wordpress.com/2017/02/what_is_dyscalculia_-_b_adler.pdf]

Chinn, S. et al. (2001) *Classroom studies into cognitive style in mathematics for pupils with dyslexia in special education in the Netherland, Ireland and the UK*. *British Journal of Special education*, 28-2. [available at: https://funmathscpd.files.wordpress.com/2017/02/chinn_et_al_cognitive_style.pdf]

DfES (2001) *Access for All*. DfES [available from: https://moodle.warwick.ac.uk/pluginfile.php/294732/mod_book/chapter/17241/Access%20for%20All.pdf]

DfES (2001) *A Framework for Understanding Dyslexia*. [available from: <https://funmathscpd.files.wordpress.com/2017/02/dfes-framework-for-understanding-dyslexia.pdf>]

ETF (no date) *Special Educational Needs & Disability microsite* [Online: <https://send.excellencegateway.org.uk>]

LSIS (no date) *How does dyslexia affect maths?* [Online: <https://webarchive.nationalarchives.gov.uk/20090319195927/http://excellence.qia.org.uk/article.aspx?o=126799>]

Butterworth, B. (no date). *The Mathematical Brain*. [Online: <http://www.mathematicalbrain.com>]

k) Visual & mastery approaches to maths

Dickinson, P. & Hough, S. (2012) *Using Realistic Mathematics Education in UK classroom*. [available from: http://mei.org.uk/files/pdf/RME_Impact_booklet.pdf]

Maths No Problem! (no date) *What is Maths Mastery?* [Online: <https://mathsnoproblem.com/en/mastery/what-is-maths-mastery/>]

MEI Realistic Mathematics Education [Online: <http://mei.org.uk/rme?section=teachers&page=rme>]

NCETM Mastery microsite [Online: <https://www.ncetm.org.uk/resources/47230>]

Key websites & videos

ALM Adults Learning Mathematics [Online: <http://www.alm-online.net>]

Excellence Gateway – maths collection [Online: <https://maths.excellencegateway.org.uk>]

National Research & Development Centre for Adult Literacy & Numeracy (NRDC) [Online: <http://www.nrdc.org.uk>]

National Centre for Excellence in Teaching Mathematics (NCETM) [Online: <https://www.ncetm.org.uk>]

National Numeracy [Online: <https://www.nationalnumeracy.org.uk>]

Youcubed [Online: <https://www.youcubed.org>]

Appendix A: Ascentis Unit Specifications

Teaching Functional Skills Mathematics

Credit Value of Unit: 15

GLH of Unit: 50

Level of Unit: 5

Learning Outcomes	Assessment Criteria
The learner will be able to	The learner can
1. Understand how to address barriers to learning functional mathematics	1.1 Analyse factors that might have disengaged functional mathematics learners
	1.2 Analyse personal barriers to learning functional mathematics
	1.3 Review strategies for motivating and engaging reluctant learners
2. Use a range of assessment strategies to support functional mathematics learners	2.1 Use initial, diagnostic and formative assessment strategies to identify and build on learners' knowledge and understanding
	2.2 Use approaches to prepare learners for summative assessment
3. Plan inclusive teaching and learning for functional mathematics learners	3.1 Plan learning in line with the subject content for Functional Skills Mathematics
	3.2 Plan contextualised learning activities which responds to learners' personal, vocational, educational and civic interests and ambitions
	3.3 Plan learning to meet the assessed needs of individual learners
4. Deliver inclusive teaching and learning for functional mathematics learners	4.1 Use active approaches to teaching and learning
	4.2 Use strategies to develop learners' mathematical problem solving and decision-making
	4.3 Use strategies to develop written, mental and visual approaches to mathematics
	4.4 Adapt teaching and learning approaches and resources to meet the individual needs of learners
5. Evaluate own practice in planning, delivering and assessing functional mathematics	5.1 Review the effectiveness of own practice in planning, delivering and assessing functional mathematics
	5.2 Identify areas for improving own practice in planning, delivering and assessing functional mathematics
	5.3 Identify opportunities to improve and update own personal mathematics skills

Indicative Content

Understand how to address barriers to learning functional mathematics

- Factors that might have disengaged learners including:
 - Social attitudes and perceptions of mathematics
 - Previous negative experiences of learning mathematics
 - Mathematics anxiety
 - Lack of perceived relevance of mathematics
 - Parental influences
 - Other barriers to engagement
- Personal factors to learning functional mathematics including:
 - Low levels of language and literacy skills
 - Specific learning difficulties- dyslexia and dyscalculia
 - English for Speakers of Other Languages needs (ESOL)
 - Lack of self-belief

- Specific learning difficulties- dyslexia and dyscalculia
 - English for Speakers of Other Languages needs (ESOL)
 - Lack of self-belief
 - Other barriers to learning mathematics
- Promoting the demand for and use of mathematics skills in the labour market, citizenship and personal life.
 - Making connections between mathematics and the real world. Very little experience of using number/maths in the real world
 - Developing learners' self-belief and attitudes to mathematics learning through use of positive messages, feedback, and praise for effort and ideas, as well as success
 - Listening to learners and involving them in decisions about their learning
 - Promoting a safe environment where learners are happy to struggle with mathematics and make mistakes
 - Developing learners' persistence and mathematical resilience

Use a range of assessment strategies to support functional mathematics learners

- Tools for initial and diagnostic assessment of functional mathematics
- Use of mathematics histories and other approaches to discover learners' past experiences and attitudes towards mathematics
- Assessment of learners' mathematics practices, interests and aspirations
- Involving learners in self-assessment and setting their own learning targets
- Use of learning activities, discussion and questioning to assess learners' understanding and progress
- The role of talk and discussion in developing learners' conceptual understanding
- Effective questioning strategies, e.g. use of open questions, different methods of response, scaffolding and stretch questioning
- Effective feedback strategies
- Identifying and using learners' mistakes and misconceptions to help them re-evaluate their understanding of mathematical ideas
- Identifying common errors in summative assessments
- Using examiner reports and past papers to identify what is difficult and how to respond
- Developing the skills for responding under timed conditions
- Strategies to support understanding of exam questions (e.g. learners writing questions, marking work, producing posters, revision guides, etc.)
- Strategies to encourage checking and explaining of answers

Plan inclusive teaching and learning for functional mathematics learners

- Knowledge of the subject content for Functional Skills Mathematics
- How mathematics skills and knowledge progress through the levels of the subject content
- How to plan learning sessions to meet the Subject Content for different levels
- Identify opportunities to relate functional mathematics to learners' personal, vocational, educational and civic interests and ambitions within the scheme of work
- Collaboration with vocational teachers and other professionals in planning
- Develop learning sessions and activities which embed mathematics within vocational and everyday contexts
- Explore how mathematics is learned and used within social and vocational practices
- Use the outcomes and results of initial, diagnostic and formative assessment to agree and review individual learner targets, and to personalise learning
- Plan learning sessions and activities which meet the needs and goals of whole groups and individual learners
- Plan and adapt activities to meet the language and literacy needs of learners to ensure inclusion
- Plan and adapt activities for those with special educational needs and disabilities (SEND) to ensure inclusion
- Plan for use of ICT software and TA support

Deliver inclusive teaching and learning for functional mathematics learners

- Activities and approaches that create connections between mathematical topics (e.g. between fractions, decimals and percentages), and between mathematics and the real world.
- Higher-order questioning to promote explanation, application and mathematical thinking.
- Collaborative small group work to facilitate sharing of ideas and methods between learners, and promotion of critical, constructive discussion to develop conceptual understanding.
- Use of activities to expose current thinking and misconceptions, allowing opportunities for resolution in a way that values mistakes.
- Use of technology to promote engagement and independent learning
- Co-operative small group work to encourage discussion and collaboration as a way of developing and supporting mathematical thinking and problem solving
- Rich collaborative tasks which are accessible and extendable to develop process skills and encourage decision-making
- Scaffolding techniques to support problem solving and develop persistence, e.g. coaching approaches, use of pictures/diagrams, peer support, writing frames
- Alternative written methods of calculation, e.g. grid multiplication, division by 'chunking', ratio tables
- Strategies for mental calculation, e.g. partitioning, bridging, rounding and compensating, doubling and halving, multiplying and dividing by 10 and 100
- Visual approaches to calculation, e.g. number lines, bar modelling
- Use of multiple representations to develop conceptual understanding
- Use of reverse calculations for checking
- Strategies for rounding, approximating and estimating
- Adapting published resources to support learners' personal, vocational, educational and civic interests and ambitions
- Adapting approaches and resources to support learners' language needs, e.g. explicit teaching of key language and vocabulary, facilitating active use of language, encouraging the use of mathematical glossaries
- Adapting approaches and resources to meet those with SEND requirements, for example:
 - Using alternative methods of calculation to support dyslexic learners
 - Providing support with problem solving to learners with ASD
 - Adapting resources to meet the needs of those with physical disabilities (e.g. sight, hearing and mobility impaired)
- Effective use of technology, including specialist software, to promote mathematical skills and understanding of mathematical concepts
- Use of on-line learning modules and materials for blended and distance learning

Evaluate own practice in planning, delivering and assessing functional mathematics

- Using feedback from learners and colleagues to review effectiveness of own practices in planning, delivering and assessing
- Using a journal or blog to reflect on the effectiveness of own practices, and identify how they might be developed or improved
- Using course programme, peer discussion and relevant literature to identify areas for improving own practice
- Using a journal or blog to reflect on different approaches that have been introduced and how they might be adapted for own context
- Awareness of potential for peer observation and practitioner research
- Development of a personal action plan
- Use of on-line tools to self-assess personal mathematics skills
- Using a journal or blog to reflect on personal mathematics skills and identify areas for improvement
- Identification of resources to improve personal mathematics skills, e.g. on-line learning materials, textbooks, relevant courses and qualifications
- Development of a personal action plan

Appendix B: Professional Standards for FE Teachers (2014)¹

Professional values and attributes

Develop your own judgement of what works and does not work in your teaching and training.

1. Reflect on what works best in your teaching and learning to meet the diverse needs of learners
2. Evaluate and challenge your practice, values and beliefs
3. Inspire, motivate and raise aspirations of learners through your enthusiasm and knowledge
4. Be creative and innovative in selecting and adapting strategies to help learners to learn
5. Value and promote social and cultural diversity, equality of opportunity and inclusion
6. Build positive and collaborative relationships with colleagues and learners



Professional knowledge and understanding

Develop deep and critically informed knowledge and understanding in theory and practice.

7. Maintain and update knowledge of your subject and/or vocational area
8. Maintain and update your knowledge of educational research to develop evidence-based practice
9. Apply theoretical understanding of effective practice in teaching, learning and assessment drawing on research and other evidence
10. Evaluate your practice with others and assess its impact on learning
11. Manage and promote positive learner behaviour
12. Understand the teaching and professional role and your responsibilities

Professional skills

Develop your expertise and skills to ensure the best outcomes for learners

13. Motivate and inspire learners to promote achievement and develop their skills to enable progression
14. Plan and deliver effective learning programmes for diverse groups or individuals in a safe and inclusive environment
15. Promote the benefits of technology and support learners in its use
16. Address the mathematics and English needs of learners and work creatively to overcome individual barriers to learning
17. Enable learners to share responsibility for their own learning and assessment, setting goals that stretch and challenge
18. Apply appropriate and fair methods of assessment and provide constructive and timely feedback to support progression and achievement
19. Maintain and update your teaching and training expertise and vocational skills through collaboration with employers
20. Contribute to organisational development and quality improvement through collaboration with others

¹ <https://www.et-foundation.co.uk/supporting/support-practitioners/professional-standards/>