

Top 10 Tips for facilitating learning in maths

This training is based on 'top tips' developed by Teaching and Learning Mentors (TLMs) at Brooklands College.

Training materials and this pack have been developed using materials from TLMs, CPD Modules on the Excellence Gateway and consultancy from the LSIS programme 'Support for English Maths and ESOL' 2012/13

<http://www.excellencegateway.org.uk/node/21207>

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CPD Evaluation Form

Please complete the following questions about this event

Name (optional)	
Name of your organisation (optional)	
Date of CPD Event	
Venue of CPD Event	
Did this CPD event meet your expectations?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Overall how satisfied were you with this event?	Very satisfied <input type="checkbox"/> Satisfied <input type="checkbox"/> Neither satisfied nor dissatisfied <input type="checkbox"/> Dissatisfied <input type="checkbox"/>
How useful was the event?	Excellent <input type="checkbox"/> Satisfactory <input type="checkbox"/> Very good <input type="checkbox"/> Unsatisfactory <input type="checkbox"/> Good <input type="checkbox"/>
What did you find most useful?	
What did you find least useful?	
How likely are you to apply your experience from the event in your day-to-day role? (Please tick one box only)	Very likely <input type="checkbox"/> Quite unlikely <input type="checkbox"/> Quite likely <input type="checkbox"/> Very unlikely <input type="checkbox"/> Neither likely nor unlikely <input type="checkbox"/> Do not know <input type="checkbox"/>
How soon do you expect to see these outcomes/outputs?	1 month <input type="checkbox"/> 1 year <input type="checkbox"/> 2 months <input type="checkbox"/> 1 year + <input type="checkbox"/> 6 months <input type="checkbox"/>
Do you need further support in this area? <i>Please comment below</i>	Yes <input type="checkbox"/> No <input type="checkbox"/>
How likely would you be to recommend this event to others in similar professional roles?	Likely <input type="checkbox"/> Neither likely nor unlikely <input type="checkbox"/> Unlikely <input type="checkbox"/>
How will you keep in touch with other attendees after the meeting?	Exchange emails <input type="checkbox"/> Meeting <input type="checkbox"/> Telephone <input type="checkbox"/> Moodle <input type="checkbox"/> Exchange visit <input type="checkbox"/> Other, please provide further details
Can we come back to you to discuss the impact of this programme on you and your organisation?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Any other comments:	

Self Assessment

Ref	Your role	Knowledge, understanding and confidence rating at start of session (1 low; 10 high)	Knowledge, understanding and confidence rating at end of session (1 low; 10 high)	Difference + -
	Ideas and approaches for embedding and facilitating maths learning across my area of the curriculum			

Reflection on Activities

Activity	How could I apply this learning/activity to support my learners?
Solving a problem (HO1)	
What is your way of working out the answer? (HO3)	
Analysing errors and providing good quality feedback (HO4)	
Reducing the ambiguity of mathematical language (HO5)	
True or false? (HO6a)	
Which is better? (HO6b)	
Equivalence card match (HO6c)	
0-9 cards (HO6d)	

HO1: Solving a problem



Prompt questions

What's the problem that you need to solve?

What information do you need to solve it?

What are some possible solutions?

Choose a solution and explain step by step what you would do.

How would you check if your answer is correct?

HO 2: Functional mathematics process skills

Functional skills qualifications in mathematics assess three interrelated process skills:

Representing – selecting the mathematics and information to model a situation	Analysing – processing and using mathematics	Interpreting – interpreting and communicating the results of the analysis
<p>Candidates recognise that a situation has aspects that can be represented using mathematics</p> <p>Candidates make an initial model of a situation using suitable forms of representation</p> <p>Candidates decide on the methods, operations and tools, including ICT, to use in a situation</p> <p>Candidates select the mathematical information to use</p>	<p>Candidates use appropriate mathematical procedures</p> <p>Candidates examine patterns and relationships</p> <p>Candidates change values and assumptions or adjust relationships to see the effects on answers in models</p> <p>Candidates find results and solutions</p>	<p>Candidates interpret results and solutions</p> <p>Candidates draw conclusions in light of situations</p> <p>Candidates consider the appropriateness and accuracy of results and conclusions</p> <p>Candidates choose appropriate language and forms of presentation to communicate results and solutions</p>

Source: Functional skills criteria for mathematics : Entry 1, Entry 2, Entry 3, level 1 and level 2 (September 2011) Ofqual/11/4953

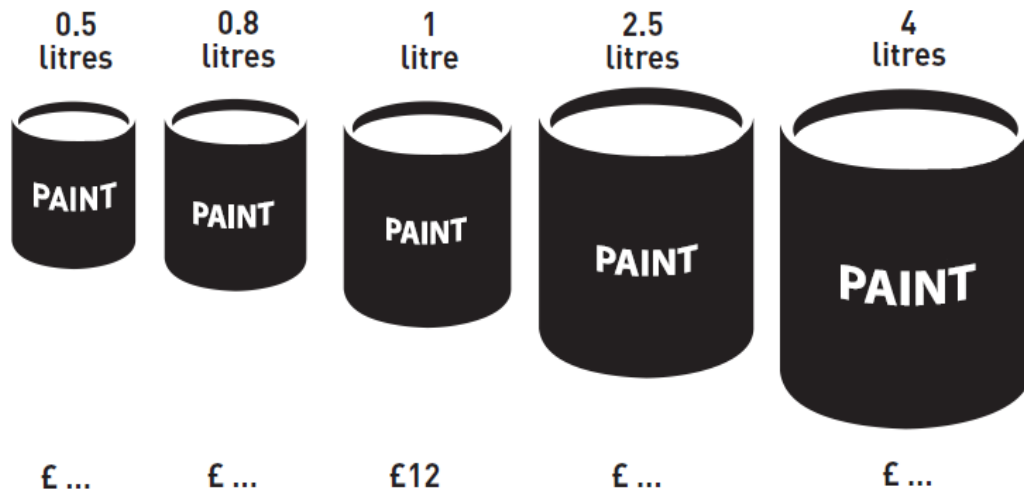
<http://www.ofqual.gov.uk/downloads/category/68-functional-skills-subject-criteria>

HO3: What is your way of working out the answer?

Proportional reasoning

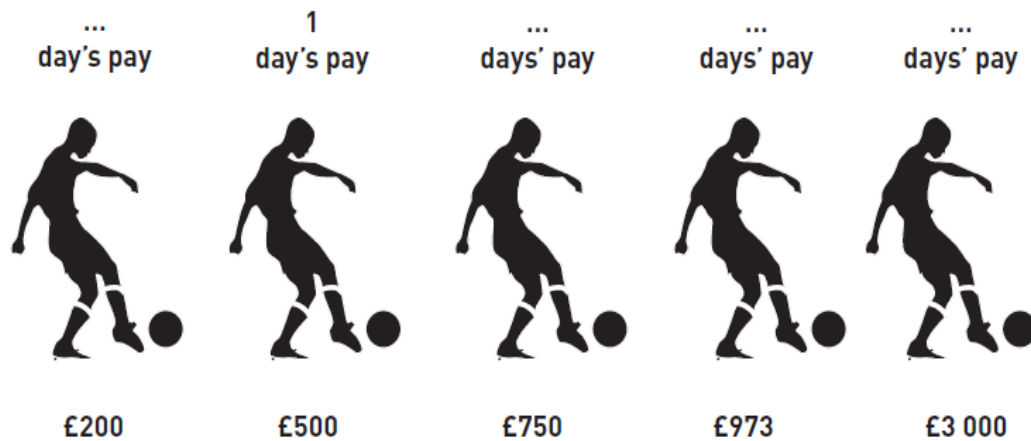
Calculate the missing prices of the paint cans.

The prices are proportional to the amount of paint in the can.



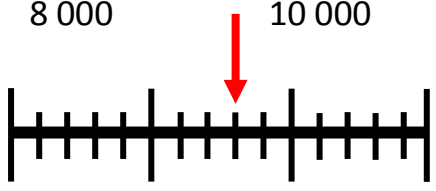
Calculate the missing days' pay for the footballer.

The pay is proportional to the number of days worked.



HO4: Analysing errors and providing good quality feedback

Choose question 1 or 2 to work on:

<p>Question 1:</p> <p>What is 50% of £400?</p> <p><i>Student answer:</i></p> $\frac{50}{400} \times 100 = \frac{50}{4} = £12.50$	<p>Question 2:</p> <p>What is the reading on the scale?</p>  <p>Student answer: 8 800</p>
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What happened and why do you think it happened?

What written feedback could you give to this learner to support learning and progress?

How else could you support this learner to progress?

HO5: Reducing the ambiguity of mathematical language

A. Look at the newspaper headlines and reports below. For each one, comment on why the use of the word 'average' is misleading.

Hedon United spend an average of twice as much on each new player!

Over the last few weeks both Hedon United and Paull Town have bought new players but Hedon United have spent an average of £4 million whereas Paull Town have spent a mere £2 million on average.

The most expensive player was Tim Wall who cost Hedon United £13 million – their other three new signings cost £1 million each. Paull Town, on the other hand, paid between £1.5 million and £3 million for each of their new players.

Teenagers lose out to parents!

Sixteen-year-olds make fewer calls on their mobile phones than their parents.

In a survey of a group of 10 teenagers and their parents, it turned out that the average number of calls made by the teenagers the previous day was 5.3. The number of calls they made ranged from three to seven.

However the dads who were asked made an average of 6.5 calls, even though nine of the ten dads questioned admitted they had not used their phone the previous day. Mr Ingram, one of the dads, revealed that he made a massive 65 calls. He explained that he used his phone as part of his job.

All children have a right to be above average

Schools should ensure that no child is below average in maths and English, said the shadow spokesperson on education at a meeting of head teachers today.

B. What questions could you ask learners to stretch their mathematical learning?

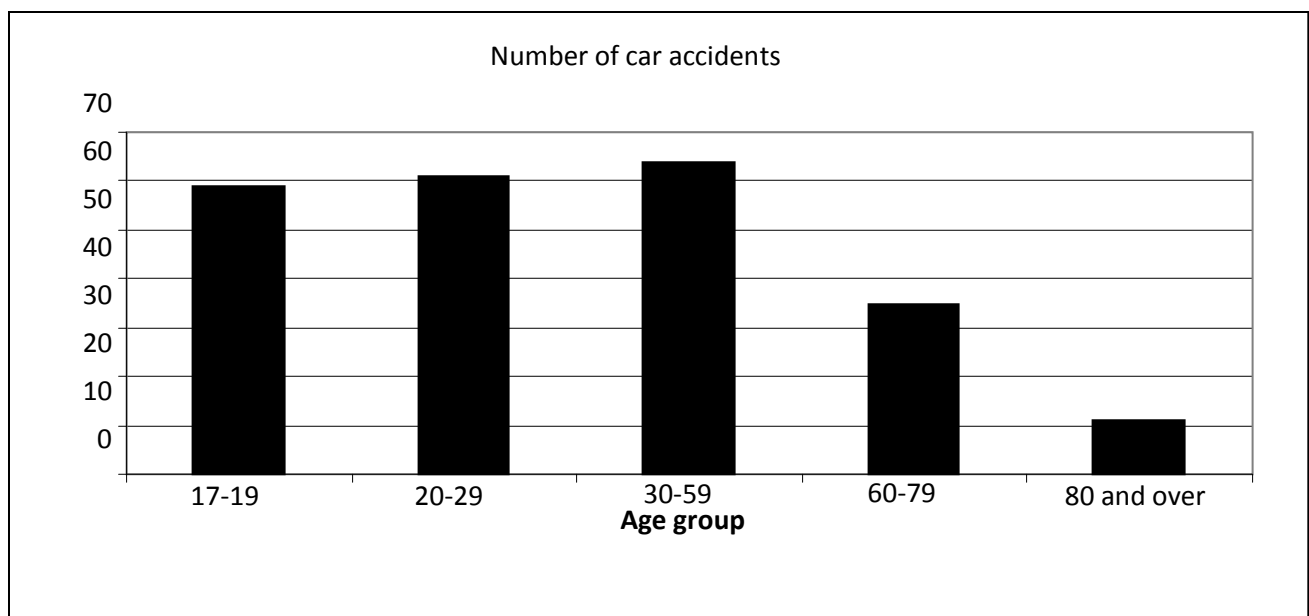
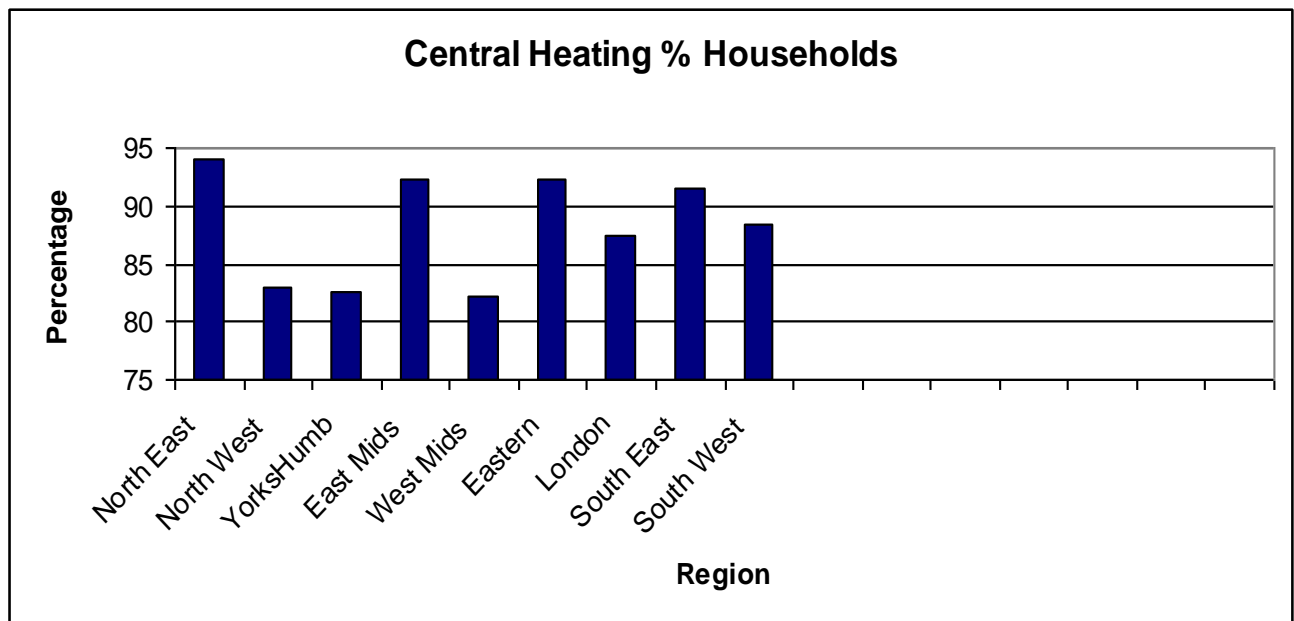
e.g. Is there anywhere in the paragraphs above that you could replace the word 'average' with any of the following words: mode, median, mean? If so, would this make the report more accurate?

HO6 - Further activity ideas to take away:

- Which of these activities could you use/adapt most easily for your learners?
- What maths skills, knowledge and understanding might learners be using to complete this activity?
- How could this problem be extended to challenge more able learners? It might help to think of 'What if...' questions (e.g. 'What if there was a 20% reduction...?')

HO6a: True or false?

Look at the two charts below. In your group, decide whether each of the statements on the accompanying cards is true or false. Give reasons for your decisions.



The safest drivers are those aged 80 and over.

17-19 year olds are safer drivers than those aged 20 to 59.

The 60-79 age group accounts for approximately 15% of all accidents.

30-59 year olds are the most dangerous drivers.

The percentage of households with central heating in the South East is twice that in Yorkshire and Humberside.

The difference between the South East and London is 5%.

More than three quarters of houses in the West Midlands have central heating.

HO6b: Which is better?

Look at the sets of charts below. For each set, decide whether Chart A or Chart B gives a better representation of the data.

Make sure you give reasons for your choices.

Set 1

Chart A

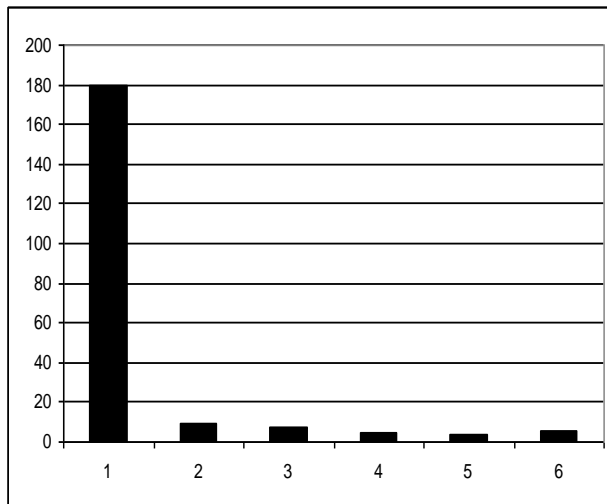
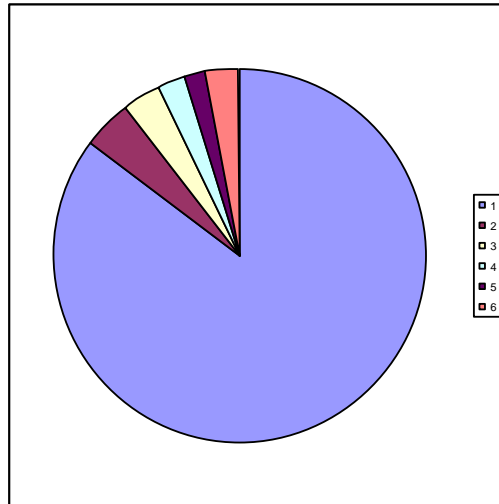


Chart B



Set 2

Chart A

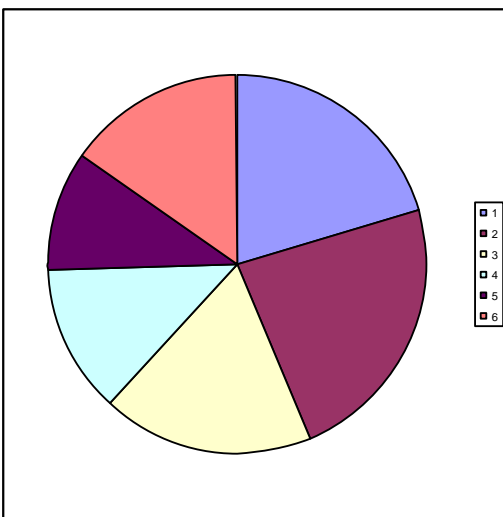
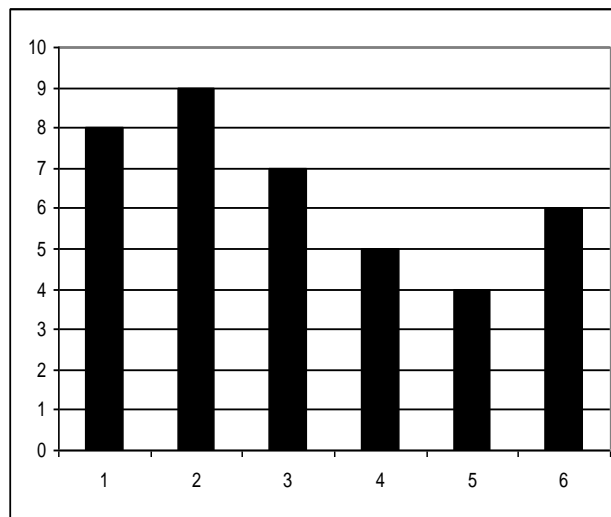
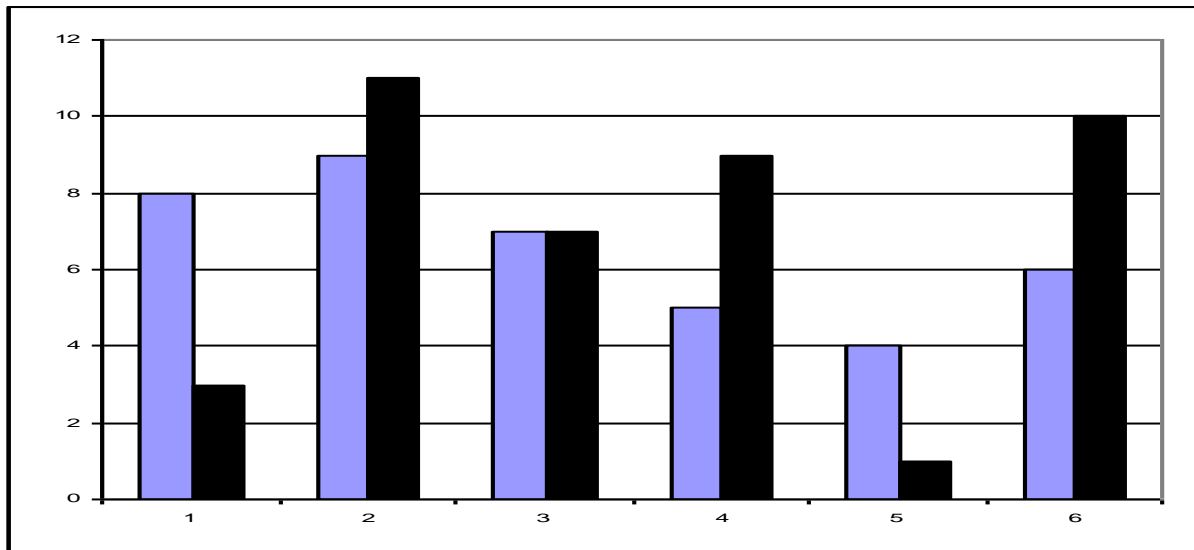


Chart B

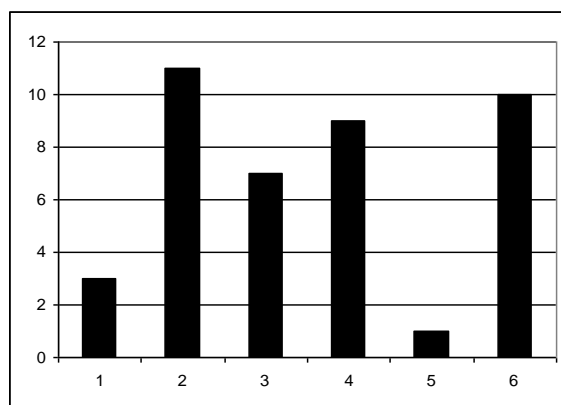
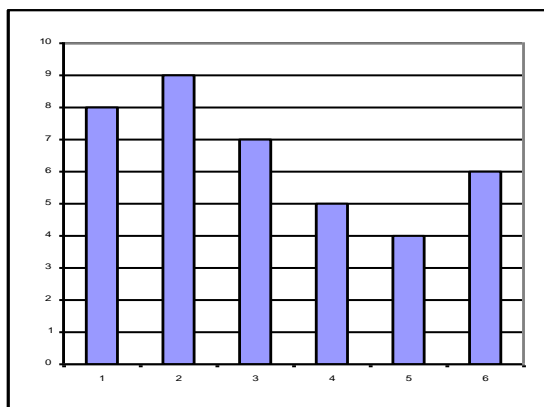


Set 3

Chart A



Charts B



HO6c: Equivalence card match

Cut up the cards and ask learners to sort equivalences

Ask learners to invent more equivalence cards

$\frac{1}{5}$	0.2	One fifth	20%
$\frac{2}{3}$	0.6	Two thirds	$66\frac{2}{3}\%$
$\frac{6}{10}$	0.6	Six tenths	60%
$\frac{1}{100}$	0.01	One hundredth	1%
$\frac{3}{4}$	0.75	Three quarters	75%

HO6d: 0-9 Cards

Each learner has a pack of cards. Ask quick fire questions and learners arrange the answers on the table in front of them. You can walk around the room to see who is getting the answer right. They can be used as a warm up, consolidation or main learning activity.

Learners can use the cards to represent ways in which they are solving maths problems.

1	2	3
4	5	6
7	8	9

0	+	x
-	/	%
=	.	£

HO 7: Useful web sites

The area on the Excellence Gateway for English, Maths and ESOL materials

<http://www.excellencegateway.org.uk/sfl>

Specific links in alphabetical order:

Adult numeracy core curriculum

<http://www.excellencegateway.org.uk/node/1514>

New interactive online version. As well as the numeracy curriculum, there are sections on embedding, family learning and employability, links to resources and other curricula, ideas, suggestions and activities, personal space, contributions from other tutors and more.

BBC Skillswise

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

Online and paper-based resources for adult numeracy learners.

Being Functional resources

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

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

Excellence Gateway - nationally developed Skills for Life materials

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

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

Embedded learning materials

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

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

Functional skills on the Excellence Gateway

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

See this menu page to access the range of functional skills resources on the Excellence Gateway, including the new functional skills starter kit: <http://www.excellencegateway.org.uk/node/20280>

Improving Learning in Mathematics

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

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

Learning Mathematics in Context

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

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

Mathematical Moments

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

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

Move On

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

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

National Centre for Excellence in the Teaching of Mathematics

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

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

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

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

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

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

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

Northern College

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

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

Nrich

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

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

OCR support materials for Functional Skills Maths:

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

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

Tasks to use as teaching resources or practice assignments.

Office of Fair Trading Skilled to Go

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

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

Resources to support the pilot of functional skills

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

Teaching and learning functional mathematics

Skills Workshop

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

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

Subtangent

<http://www.subtangent.com>

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

Tarsia Formulator

http://www.mmlsoft.com/index.php?option=com_content&task=view&id=4&Itemid=5

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

