Top Ten Tips for facilitating learning in maths

Top Tips	Key Points/Ideas/Resources
1. Review your scheme of work to identify where maths naturally arises, then reflect on how you can make the most of the learning opportunities for the learners in your classes; ask your Teaching and Learning Mentor (TLM) if in doubt.	• Know the levels of Eng/Maths of your learners and be familiar with the qualification they are taking.
2. Facilitate the learning of maths skills in context and with everyday items, then discuss where else this learning might be applied. This will support learners to prepare for their exams which do ask them to demonstrate learning in unfamiliar contexts.	• Keep it relevant to subject study area/interests. • Web links for embedding: www.Skillsworkshop.co.uk • http://rwp.excellencegateway.org.uk/Embedded%20Learning/ • http://tlp.excellencegateway.org.uk/tlp/xcurricula/lmic/
3. Make maths learning interesting and fun by using problem solving activities; this encourages learners to think things through and develop their independence and confidence in real life situations.	• Sabotage your lesson with a relevant maths problem. • Encourage a plan/do/review approach to problem solving. • Use the high ropes/reaction wall.
4. Use costing and producing a product as a vehicle for developing number skills.	• Cost, scale up/down, VFM, ratio, proportion. • Use of costing sheet as a framework.
5. Allow learners to find their own way of working out a maths question and encourage them to record their method in clear and logical steps – show them examples, but don't insist that there is ONLY one route to the answer.	• In exams, as long as the answer is correct and the method works, it is right – significant marks are awarded for working out so vital to learn this.
6. Allow learners to make mistakes and use these mistakes as a tool for learning. Provide positive feedback to promote confidence and esteem.	• Encourage learners to evaluate their mistakes and the mistakes of others, e.g. peers or examples you provide. • Expose and discuss common misconceptions. • Remind learners to estimate answers before starting a calculation.
7. Extend and stretch learning by asking open questions which develop mathematical thinking; consider formulating good quality questions when you are planning.	• E.g. What different methods could you use to check your answers? • What if you had half/double/one third as many? • How could you work this out using/not using a calculator?
8. Integrate the language of maths into activities and instructions (verbal /written) and explain these terms clearly to reduce confusion and ambiguity.	• Maths terms bingo; word search; maths dictionaries. • Use highlighters – words unknown/confusing.
9. Where possible, take maths learning outside of the classroom.	• Plan a trip, use maps, timetables, cost, and timings. • Relate maths learning to work on placement, jobs etc.
10. Differentiate your language, tasks, groupings and resources to ensure the maths is accessible to and enjoyable for all learners.	• Use different methods, e.g. maths rap, memory aid and card games, maths stories, sequencing puzzles, 0-9 cards, competitions, voting technology and mini white boards.

Top 10 Tips for facilitating learning in Maths – Training Plan (90 minutes)

Time	Activity	Resource
5	**A. Introduction** • **Aims on board/flip chart:** To gain ideas and confidence for embedding and facilitating maths learning across the curriculum. • **Purpose:** To continue to support our learners in developing their maths in a way which helps them gain qualifications and also the confidence and competence in the skills necessary for life and work. • Basic agenda is to go through top tips from Teaching and Learning Mentors (TLM) and have a go at some related activities. • We hope you will feel energised and will take away a few ideas to try. • 'Before we start, please can you go to the end of the evaluation form and rate yourselves on the self-assessment 'before the session.''	Flip Chart/Board with aims and purpose. Participant pack *(all handout are contained in this pack)* Evaluation form (self-assessment sheet on page 3 of pack).
10	**B. Maths Skills at different levels – warm up** • Quick activity to reflect on your learners and the levels of their maths skills. • Functional skills = 5 levels: Entry 1, 2, 3, Level 1 and 2. GCSEs are equivalent to Level 2 and A-levels to Level 3. • The handout lists skills, knowledge and understanding required for 'number' at 3 different levels (Taken from the Adult Numeracy Core Curriculum. It informed the writing of the functional skills criteria alongside Key Skills, so although we might not use this as a direct curriculum, it is useful to provide a feel for what is expected at the different levels.) • You have to read it and decide as a group which these three levels are represented e.g. Entry 1, 2, 3 … E2, 3, L1 E3, L1, L2 or L1, L2, L3? What makes you think you are right? • **Extend learning:** Think of your learners at Level 1 or 2 – are they confident with these skills? Which of these skills do you actively teach? Are you surprised by the skills expected?	Handout from Adult Numeracy Core Curriculum page 15 Number showing E3, L1 and L2 (delete levels and codes.) If you want to see more of this curriculum, it can be found on the Excellence Gateway.
65 in total	**C. Top Tips – Read through the Top Tips sheet and have a go at some activities** • Tell delegates that there is a 'reflection sheet' on page 4 of their packs which they can use to reflect and take notes as the session progresses. Give out the Top Ten Tips sheet. • Read through the Top Tips one by one stopping along the way to complete the activities below. If you are running short on time, omit an activity – make sure you get through all ten tips! • Use your experience to expand and add any short anecdotes which are relevant. • Refer to the 'key points' column to elaborate. • **Trainer:** You can replace the activities listed below with others as appropriate to your delegates – just make sure they relate to the tips sheet, are appropriate for learning maths at any level and are active.	Reflection sheet page 4 of the participant pack Top Ten Tips sheet

(15)	**Top Tip 3: Problem solving** • Groups complete the activity together. • At first they may be confused as there is insufficient information to complete the problem, but this task is all about problem solving, e.g. knowing what information they would need to have in order to solve the problem … then, when they do have that information, what they would do with it to solve the problem, and then finally … getting to a reasonable answer. • **Ask for feedback:** Ask for reflection on exactly what learning this activity might promote. Make the point that this aligns well to functional skills as learners are marked heavily on process, e.g. representing, selecting and analysing. See handout 2. • **Extension questions** 1. What could this assessment tell us about a learner's ability to solve a problem using maths? 2. To what extent was there one correct answer to this problem? 3. 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…?) 4. What maths skills, knowledge and understanding might the learner be using to solve this problem?	Handout 1 Handout 2
(15)	**Top Tip 5: What is your way of working out the answer?** • Ask each table to choose one of the proportional reasoning questions on handout 3. • Individuals spend 3 minutes working on the chosen question, noting down their working out. • Share with colleagues on their table – have people used different methods to arrive at the same answer? Refer to the TV show Countdown (numbers game.) • Share outcomes with the whole group.	Handout 3
(15)	**Top Tip 6: Analysing mistakes and giving feedback** • Ask pairs/threes to choose either question 1 or 2 to work on. • Work together to consider exactly what written feedback could be given and what further support may be offered to this learner. Ensure feedback includes praise and an area for improvement – encourage a range of responses including strategies for success with something else to practice, a memory aid, visuals, use of estimation, thinking it through practically, different ways of checking answers, phrasing the question differently, further support from teacher/peer, and independent learning resources including e-learning. • Discuss on tables and then share key points with the whole group.	Handout 4
(15)	**Top Tip 8: Reducing the ambiguity of mathematical language** • Activity A: Ask individuals to read through the three reports on handout 3 and then engage in a group discussion to identify why the term 'average' may be misleading (5 minutes) • Quick feedback from each group – make the point that many mathematical terms are used	Handout 5

	inaccurately and ambiguously in general life, and this can add to confusion. We can support learners by completing activities like this which asks them to examine these terms in more detail. • Complete activity B. Split delegates into two large groups. Good quality questions which support learning and progress – who can think of the most – 3 minutes – go! • The groups share answers with each other – light heartedly congratulate the team with most high quality answers but praise for all.	
(5)	**Top Tip 10: Active learning activities** Direct delegates to 4 further active maths learning activities in their packs which they can reflect on in their own time – have a quick look now. 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…?)	Handout 6a - d
10	**Summary and Evaluation** • Summarise the session (skills at different levels; top tips from TLMs and activities) • What will you take away from today? Most useful thing - one idea each. • TLM area on intranet is developing – look out for updates, web links and resources to support English and maths. List of web links in your pack on handout 7. • Evaluation forms – rate yourself again on the self assessment part to see if you feel you have improved Collect in evaluation forms and self assessment – calculate % increase in confidence from self evaluation	Evaluation forms Handout 7