



The
Education
& Training
Foundation

Hairdressing & Beauty Therapy

The Maths Pipeline:
*Supporting maths in post-16
vocational provision*



Resources created as part of
the Maths Pipeline programme.

MEI Innovators in
Mathematics
Education



www.et-foundation.co.uk

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Hairdressing & Beauty Therapy

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About this guide

This guide is one of a series aimed at practitioners from a wide range of providers, including colleges, independent learning providers and those working in the Secure Estate, who support post-16 vocational learners to develop their maths skills up to and including level 2.

The guides, together with films which aim to stimulate viewers to reflect on their practice, have been created as part of the [Maths Pipeline Programme](#)

As a vocational teacher you are able to provide a practical learning environment in which learners see a real purpose for developing their maths skills, and you can demonstrate convincingly that strong maths skills underpin vocational professionalism. This guide suggests ways in which you can engage your learners' interest and support them to develop their maths skills.

Throughout the guide you will find sections encouraging you to take a look at other websites, film clips or educational research documents. These sections are identified using the icons shown below.



The guide is one of five in a series from the Education and Training Foundation (ETF) Maths Pipeline Programme. There are four Guides aimed at vocational teachers working in

1. Construction and the Built Environment
2. Health and Social Care
3. Hospitality and Catering
4. Hairdressing and Beauty Therapy

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Why should I be concerned about developing my learners' maths skills?

Here are four good reasons:

Developing your learners' maths skills can help them progress in their vocational course

When vocational and maths teachers work together, retention and achievement rates for maths and for the vocational subject improve. See [You Wouldn't Expect a Maths Teacher to Teach Plastering.....](#)

Improving your learners' maths skills increases the employment opportunities open to them.

Maths skills are highly transferable, and improving them will help a learner to become more employable, regardless of whether they stay with their current vocational area.

Maths errors can be costly to any business

Think about the wider consequences if people make mathematical errors whilst working in their chosen area of employment or self-employment. Errors can waste time and resources, can lead to dissatisfied customers, and can undermine health and safety standards.

Some teaching ideas

We've introduced a small number of teaching ideas in this section to illustrate approaches which relate maths to your vocational subject and which help learners to understand key mathematical ideas deeply.

Active learning is key; in particular, it can help learners to become aware of and resolve any mathematical misconceptions they may have. Active learning uses strategies such as group work, discussion and open questioning to encourage learners to become re active, to think mathematically and make links between topics, instead of using memorised techniques or processes. This approach helps students to make connections between their ideas, to understand the interconnected nature of maths and confront common misconceptions and difficulties.

Later sections (see page 9 onwards) describe and respond to some challenges you might face, expand on the principles and research underpinning these teaching approaches, and offer many more teaching ideas.

Picturing the maths in your vocational area

Start with a picture related to hair and beauty, one which your learners can relate to, and ask them to list some jobs/tasks that spring to mind. Then ask your learners to think about the maths they are likely to encounter when performing those tasks.

Here is one example used at a Vitaliser event, run as part of the [Maths Pipeline Program](#) for hairdressing teachers. You could substitute a picture of towels, colouring solutions or beauty products, shampooing, rollers, a reception desk, an appointment book, etc.

Tasks/Jobs



Maths which underpins one of these tasks: Mixing hair dyes





This [interactive tool](#) lets you design your own salon. It can be used to cover areas such as scale drawing, practical design aspects, costing, etc. The tool could also support the work in this [booklet](#) from the Hwb Welsh key skills support program.

[VirtualSalon](#) is an interactive activity that shows some of the maths involved with running a hair and beauty salon.

Sometimes true, always true, never true

This kind of activity challenges learners to think deeply about a topic, and also requires them to articulate their thinking. As they are working on the activity, listen to the arguments they are creating, and encourage them to express themselves clearly verbally and on paper; this formative assessment aspect will help identify and resolve any misconceptions.



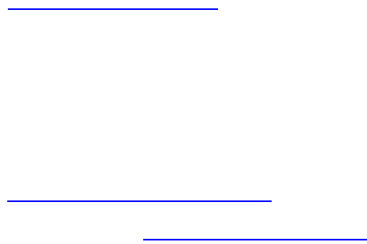
Find a space large enough for all the learners to line up facing you. Give each learner one of the cards. Ask the group to select one of the statistics from the cards, e.g. total population. Now ask the learners to line up in order of total population, from the smallest at one end to the largest at the other end. When they have done this, ask them to read out their population statistic. Get the whole group involved in checking that everyone is in the right place in the line.

Difficult topics

There may be specific mathematical topics which, from experience, you know learners will find difficult. Below are some suggestions of resources to support learners in some of these areas.

[Maths4life](#) is a series of booklets providing teaching materials for a variety of topics, including number, time and money, fractions, measurements. (You will need to register with NCET, get a free account.)

[Maths Everywhere](#) has some excellent short clips to help learners develop their maths skills. The site has three sections; some tools to help with everyday maths (e.g. currency conversion, planning journeys); a set of 'how to do' short clips; some



Meeting the challenges

Working together with maths practitioners

Professor Malcolm Swan of Nottingham University, whose research underpinned both *Improving Learning in Mathematics*, and *Thinking Through Mathematics*, identified eight principles for effective teaching of maths.

Teaching is more effective when it ...

- | | |
|--|---|
| t builds on existing knowledge | t encourages reasoning not 'answer getting' |
| t exposes and discusses misconceptions | t uses rich, collaborative tasks |
| t uses higher-order questions | t creates connections between topics |
| t uses cooperative small group work | t uses technology in appropriate ways |



Take a look at [Improving Learning in Mathematics](#) and [Thinking Through Mathematics](#) on the NCETM website for more information about these principles and how you can apply them in your own practice.

Initial, diagnostic and formative assessment

Your learners will learn most effectively when you and they develop insights - through initial and formative assessment approaches - into their needs. Maths specialists often carry out initial and diagnostic assessments before learners join a course, and may be able to share the results with you. You can also use

How can I develop my own maths knowledge and skills?

In parallel with developing your teaching strategies, you may wish to develop your personal maths skills.

A quick internet search may yield a good film clip or document which helps. Another approach might be to ask a friend or colleague, maybe someone from your maths department if you work in a college. Some clips of staff working together are shown in the films which link to this guide, and have been referenced earlier:

to [YouTube:](#)

References

External references

This guide offers links to external websites and resources. At the time of publication all urls provided were correct; however, website addresses may be updated and changed. For each reference, the full name of the publication / resource has been provided to help you deal with any broken links.

The references below are split by chapter and section heading.

About this guide

1. The Education and Training Foundation Maths Pipeline <http://www.et-foundation.co.uk/>
2. YouTube video: ETF MPP Supporting maths in post-16 vocational and Secure Sector provision: An introduction <https://youtu.be/EiLhhqE1Rn4>
3. YouTube library: Excellence Gateway lms to support post-16 teaching and learning <https://www.youtube.com/user/excellencegateway/>

Why should I be concerned about developing my learners' maths skills?

4. "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 (2006) <http://dera.ioe.ac.uk/22311/>
5. ETF Professional Standards: 'Initial Guidance for users of the Professional Standards for Teachers and Trainers in Education and Training – England' <http://www.et-foundation.co.uk/wp-content/uploads/2014/05/ETF-Prof-Standards-Guidance-v2-2.pdf>

Why use a vocational lesson to develop maths skills?

6. YouTube - ETF MPP Hairdressing and Beauty Therapy: Why teach maths in a vocational setting? <https://youtu.be/4QQJErwpmE>
7. YouTube - ETF MPP Hairdressing and Beauty Therapy: Planning to practise and assess maths in the workplace <https://youtu.be/lyQrFED4E3E>
8. YouTube - ETF MPP Hairdressing and Beauty Therapy: Building mathematical confidence <https://youtu.be/Ds3yskwo0>
9. See 4
10. ETF: 'Effective Practices in Post-16 Vocational Maths' <http://www.et-foundation.co.uk/supporting/research/effective-practices-post-16-vocational-maths/>
11. NIACE: 'Engaging Learners in GCSE Maths and English' Feb 2015 http://shop.niace.org.uk/media/catalog/product/e/n/engaging_learners_report_1.pdf
12. NIACE: 'Vocational Training and Employability Skills in Prisons and Young Offenders Institutions' Jul 2013 <http://shop.niace.org.uk/training-skills-prisons-yois.html>
13. See 5

Some teaching ideas

Picturing the maths in your vocational area

14. See 1

Other learning activities related to your vocational area

15. Excellence Gateway home page featuring a search facility <http://www.excellencegateway.org.uk/>
16. Excellence Gateway Embedded Learning for vocational areas <http://rwp.excellencegateway.org.uk/Embedded%20Learning/Vocational/Hairdressing/>
17. Cre8 Salon online resource in the National STEM Centre e-Library (You will need to register free.) <http://www.nationalstemcentre.org.uk/elibrary/resource/360/cre8-salon>
18. Interactive tool to design your own salon <http://www.beautydesign.com/salon-planner/>
19. Trainer Guide for Key Skills in Hairdressing on the TES website <https://www.tes.co.uk/teaching-resource/key-skills-in-hairdressing-6017522>

Tarsia

20. Tarsia on the Hermitech Laboratory - Information on Formulator Tarisa
<http://www.mmlsoft.com/index.php/products/tarsia>

Sometimes true, always true, never true

21. NCETM interactive resource, 'Thinking Through Mathematics'. You need to register free on the NCETM portal
<https://www.ncetm.org.uk/online-cpd-modules/ttm/contents>
22. NCETM Thinking Through Mathematics - collection of statements You need to register free on the NCETM portal
<https://www.ncetm.org.uk/online-cpd-modules/ttm/teaching-activities/evaluating-mathematical-statements>

Top Trumps

23. TES online teaching resources. Enter 'Top Trump maths' into the search term.
<https://www.tes.co.uk/teaching-resources>

Other resources to help learners understand key mathematical ideas

24. WisWeb applets http://www.uu.nl/wisweb/applets/mainframe_en.html
25. Virtual Maths website <http://www.virtualmaths.org/>

What challenges am I likely to face?

Engaging learners

26. YouTube - NCETM Im on maths in hairdressing <https://www.youtube.com/watch?v=GQGW6FJWfDM>
27. Film on BBC Skillswise - Why are maths and English skills useful in hair, fashion and beauty jobs?
<http://www.bbc.co.uk/programmes/p00k3yrd>

Some learners may need to improve their confidence with basic maths

28. NIACE report - 'Vocational Training and Employability Skills in Prisons and Young Offenders Institutions' May 2013 (see page 44) http://shop.niace.org.uk/media/catalog/product/v/t/vt_and_es_report_2013_nal_1.pdf
29. NIACE - 'Maths4Prisons: Maths Mentor Handbook' <http://shop.niace.org.uk/maths4prisons-handbook.html>
30. YouTube - ETF MPP Teaching Maths in the Secure Sector: Developing peer mentoring in the secure sector
<https://youtu.be/X-R2-zBqNqU>

Different topics

31. NCETM website - Maths4Life 'Taking the Numeracy Challenge Forward Resources'
https://www.ncetm.org.uk/resources/numeracy_challenge_microsite_resources
32. Maths Everywhere, interactive learning tool <http://www.mathseverywhere.org.uk/>
33. Skills workshop - Free functional skills and skills for life resources
http://www.skillsworkshop.org/contextual?op=or&tid_depth%5B%5D=4
34. See 15
35. Excellence Gateway: Exhibitions website - Raising Standards in Maths <http://maths.excellencegateway.org.uk/>

Working in the Secure Estate

36. NIACE - Vocational Training and Employability Skills in Prisons and Young Offenders Institutions
http://shop.niace.org.uk/media/catalog/product/v/t/vt_and_es_report_2013_nal_1.pdf
37. YouTube - Embedded Learning at HMP Swaleside
<https://www.youtube.com/watch?v=AbRfDOOf-OA&feature=youtu.be>
38. Prisoners' Education Trust - Teaching in the gym at HMP Swaleside, 15 May 2013
<http://www.prisonerseducation.org.uk/news/teaching-in-the-gym-at-hmp-swaleside>
39. Prisoners' Education Trust - Fit for Release, Aug 2012
https://fbclientprisoners.s3.amazonaws.com/Resources/PET_Fit_for_Release_Report.pdf
40. YouTube - Offender Teaching & Learning Toolkit (Vocational Training)
<https://www.youtube.com/watch?v=2kNpx506-vU>
41. YouTube - Offender Teaching & Learning Toolkit (English, Maths, ESOL & ICT)
<https://www.youtube.com/watch?v=KoCUJ0CSJtl>
42. Excellence Gateway: Exhibitions website - Offender learning <http://offender-learning.excellencegateway.org.uk/>

