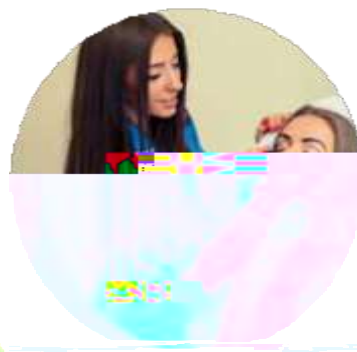


Hairdressing & Beauty Therapy

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





Developed by Mathematics in Education and Industry (MEI) and
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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.

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About this guide

This guide is one of a series aimed at practitioners from a wide range of providers, including FE colleges, independent learning providers and those working in the Secure Estate, who support post-

should demonstrate commitment to:

“Address the mathematics and English needs of learners and work creatively to overcome individual barriers to learning.”

Why use a vocational lesson to develop maths skills?

Many post-16 learners view their previous learning experiences in maths very negatively.

The prior experiences of many vocational learners mean that they may have little or no maths confidence. Making maths relevant with authentic learning activities that link to real work contexts, and highlighting where learners have used maths in your lessons have real benefits. The desire to make progress in their chosen vocation provides considerable motivation for learners to master relevant mathematical skills and concepts. Success and enjoyment in a vocational lesson means their expectations will be high. They may be more willing to persevere with challenging maths and maths that isn't directly relevant to the vocational area but is relevant to a Functional Skills or GCSE qualification they are aiming for.

View this [film](#) in which learners comment about how learning maths in a vocational lesson has helped them to understand concepts. Notice how Vicky from Intuitions Ltd comments "hairdressers are practical people" and explains how they prefer to learn in a practical way, for example learning about ratio by mixing solutions, or about angles by cutting hair.

In this [clip](#) the

Some teaching ideas

Maths which underpins one of these tasks: Mixing hair dyes





This [set](#) of resources produced by Cre8ate Maths involve aspects maths in a salon setting. (Register for free with the National STEM Centre in order to download them.)

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.



Using vocationally-oriented learning materials helps engage and maintain learners' interest; however, often you will also need to provide support so that learners develop deep understanding of essential mathematical ideas, and develop confidence in their own ability. You could use or adapt the activities below.

Examples of active learning activities that you could use

These puzzles use measurement and percentages, both of which are relevant to hair and beauty; and you can make similar puzzles of your own using other key concepts.

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.

The idea is that the learners have a collection of

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support helps learners identify and resolve any mathematical misconceptions.

In the example below the theme is countries, which learners may see as relevant to

the Secure Estate in England.

When learners help each other, they reinforce their own knowledge and build their confidence; this also allows you to spend more time with the learners who need extra support. Often if these

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 NCETM and set up 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 and planning journeys); a set of 'how to do' short clips; and some interactive questions to try. It is also available as an app.

The [Skills Workshop](#) is a site where practitioners can upload their own

You might get some further ideas from the report [Fit for Release](#), which discusses ways of helping prisoners prepare for life outside the prison.



This [clip](#) introduces the ETF Offender Teaching and Learning (Vocational Training) Toolkit, and this [clip](#) covers the maths content of the toolkit. Related materials are available on the ETF [Offender Learning Exhibition Site](#).

Meeting the challenges

Working together with maths practitioners

There are benefits to all concerned when vocational and maths practitioners plan work together. Maths specialists can gain an insight into where learners are likely to encounter maths in the world of work, and you get to see how maths is taught to your learners in their maths lessons. You may also be able to get support from the maths specialists in relation to particular maths topics.

This report and the associated case studies describe how embedding works, and the benefits it brings. "[You Wouldn't Expect a Maths Teacher to Teach Plastering ...](#)" NRDC, Nov 2006.

Level to Level 2.

A related resource, [Improving Learning in Mathematics](#), offers similar approaches for mathematics from Level 1 to Level 3.

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 ...

- builds on existing knowledge
- exposes and discusses misconceptions
- uses higher-order questions
- uses cooperative small group work
- encourages reasoning not 'answer getting'
- uses rich, collaborative tasks
- creates connections between topics
- 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 informal self-evaluation questionnaires to help you and your learners understand their needs, and often these can be directly related to a topic they are working on. And most of the resources recommended in this guide have strong elements of formative assessment; for example insights often emerge directly from learner-learner or teacher-learner discussions during active learning activities.

The [Excellence Gateway](#) has a collection of diagnostic

Track learners' mathematical progress alongside their vocational targets

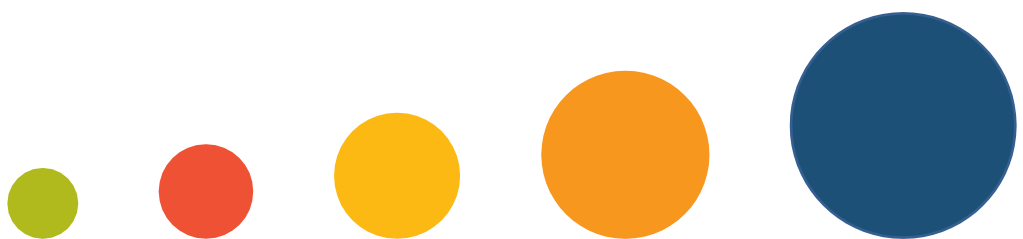
This will help you and the learners to see where they are progressing and where they need further support. This tracking could also be linked to a positive incentive scheme. Again, this is an area that your maths specialist may be able to support you with.

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:

- [YouTube](#): ETF MPP Hairdressing and Beauty Therapy: Why teach maths in a vocational setting?
- [YouTube](#): ETF MPP Hairdressing and Beauty Therapy: Planning to practise and assess maths in the workplace
- [YouTube](#): ETF MPP Hairdressing and Beauty Therapy: Building mathematical confidence



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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
Tarsia <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.fi.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 film on maths in hairdressing <https://www.youtube.com/watch?v=GOGW6FJWfDM>
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 basicmaths

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_final_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>

Difficult 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.excellencegatewaye860.204 JTJ0.204 RG>

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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=KoCUI0CSJtI>

42. Excellence Gateway: Exhibitions website - Offender learning <http://offender-learning.excellencegateway.org.uk/>

Meeting the challenges

Working together with maths practitioners

43. See 4

Teaching and learning strategies:

