

Vocational Maths Mentors:

A guide for Instructional
Officers and Maths Mentors
on embedding maths in
vocational workshops



MATHS
MENTORS

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Published by the Learning and Work Institute
21 De Montfort Street
Leicester LE1 7GE
Company registration no. 2603322
Charity registration no. 1002775

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INTRODUCTION

This guide is for prisons which wish to deliver maths in vocational workshops and industrial areas. It can be used by Prison Governors, Heads of Learning and Skills, Industry Managers and Instructional Officers, education staff, workshop leaders and Maths Mentors.

It is based on a project that Learning and Work Institute ran with eight prisons between April 2016 and March 2017. Vocational Maths Mentors aimed to work with Mentors and IOs to develop the skills and resources needed to embed maths in their vocational workshops.

This guide draws on the findings of that project and provides information on how to embed maths in vocational contexts. It explains why it is important to embed maths in industrial areas in prisons and the benefits for prisoners, Mentors, IOs and wider prison staff. It gives hints and tips for Mentors and IOs and shows the different approaches you can use to support prisoners to improve their maths while they are working. It also includes information on some of the challenges that you might face when supporting maths in vocational workshops and the different ways these can be overcome.

You don't have to read this guide from start to finish. You can dip in and out of it as you need to. If you already have a Maths Mentors scheme set up in your prison then you might want to go straight to the section on approaches to embedding maths and how to overcome challenges. If you're just starting up a scheme then you might want to read the sections about getting started and training mentors.

This guide is accompanied by a pack of resources which you can use to embed maths in different vocational areas. This can also be found on the Virtual Campus. For more information on how to use the resources, go to page 21

ABOUT THE MATHS MENTORS SCHEME

Led by Learning and Work Institute (L&W) and funded by the Department for Education (previously by BIS), the Maths Mentor scheme has been running since September 2012. The aim of the scheme is to train prisoners to become Maths Mentors and help their peers to handle everyday maths situations, become more confident about their own maths skills, and encourage them to join maths courses. Maths Mentors, together with prison staff, have now successfully supported other prisoners in over 30 prisons across England.

The information included in this guide is based on the Vocational Maths Mentors project which Learning and Work Institute (L&W) ran from April 2016 to March 2017. This project built on our Maths Mentors work and supported prisoners and Instructional Officers to embed maths skills in vocational and industrial activities, such as laundry, waste management, production, catering and gardening. We delivered a three-day training programme with eight prisons and worked with them to identify, re-purpose and develop their own resources to use in vocational settings, some of which are included in the resource pack.

The prisons used two different types of delivery. In prisons based in the West Midlands we delivered a direct 'train the Mentor' approach,

where Mentors and IOs attended training sessions together. In prisons in the East of England we delivered a 'train the trainer approach', where IOs were expected to pass knowledge onto Mentors.

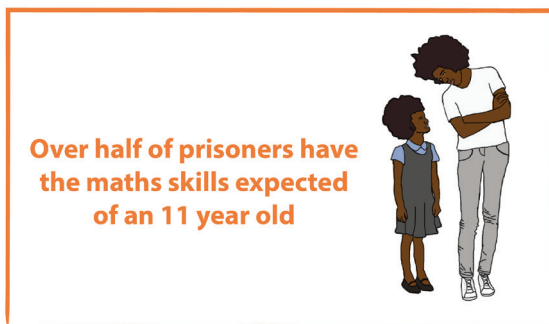
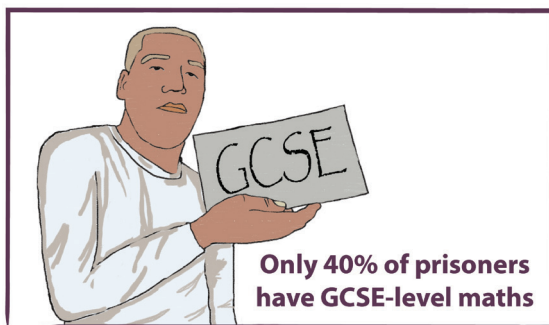
In each prison, we evaluated the training and captured feedback on the resources used. We did this by carrying out group discussions and feedback sessions with Mentors and industry staff, interviews with industry managers and questionnaires for training participants. The findings from these activities were used to review and improve the delivery of the project and the resources. They are included throughout this guide to show the difference that having Maths Mentors in vocational areas can make.

WHY SHOULD PRISONS EMBED MATHS IN VOCATIONAL AREAS?

There are lots of different reasons why prisons should embed maths in their vocational workshops. Here are just a few:

It can help improve the maths skills of prisoners

In the UK, there is a real need to help adults improve their maths, as shown by national statistics on maths levels. Only 50% of adults in the UK have GCSE-level maths skills – in prisons this drops to 40%.



Embedding maths in vocational workshops can help overcome this challenge, demonstrating maths in real life contexts and the need for prisoners to have maths skills for employment on release. Research¹ suggests that learning maths in context helps learners to understand and remember the things they are taught. It helps them see how maths is relevant to their work and everyday lives, and can motivate them to continue learning at higher levels. Learning maths on the job can also help learners to understand how to use maths in the workplace, making them more employable on release.

"Within our work, both in the prison or at our factory, basic maths forms an essential element of everything we do, whether it's a case of simply counting the stock, knowing the production or from our staff's viewpoint, or knowing what wages they can expect with overtime and bonus." **Lawrence M Barry & Co**

¹ ETF (2014) Effective Practices in Post-16 Vocational Maths.
<http://www.et-foundation.co.uk/wp-content/uploads/2014/12/Effective-Practices-in-Post-16-Vocational-Maths-v4-0.pdf>

Mentors are effective at engaging prisoners in maths learning

Our work with Maths Mentors has found that peer support is an effective way of encouraging prisoners to engage in maths learning. Across the prisons we've worked with, Mentors and mentees have told us that it is easier for prisoners to ask their peers for help with their maths, as they are "in the same boat". Mentors can work closely with prisoners on a one-to-one basis to help them understand maths problems, and can also make maths more relevant to prisoners' everyday lives.

"I think because we are approachable, people feel more comfortable to admit their barriers to maths and try and tackle these. That's what makes it work." **Mentor**

"It's learning together in a process for enjoyment and not fear of ridicule of your own abilities." **Mentor**

A vocational workshop can be less daunting than a classroom

Our Vocational Maths Mentors project found that combining the use of Mentors and embedding maths in workshops produced encouraging results. Mentors felt that lots of prisoners are daunted by the idea of learning maths and often lack confidence in their maths skills. As a result, they could find it difficult to engage them in maths learning on the wing, let alone encourage them to join a maths class. However, Mentors found that doing maths in workshops was a good way of encouraging prisoners to take their first steps back into learning.

"It's a good training opportunity for prisoners who do not like classrooms."

Mentor

It helps prisoners recognise the importance of maths

Mentors could use the activities that prisoners were doing in the workshops to help them think about maths and recognise the skills they were already using in their day-to-day work. This boosted their confidence and helped them realise that they could do maths. Linking maths to learners' work was also a good motivator as it could help prisoners see the importance of improving their maths skills to get employment.

"This can help people improve their skills and have more chances to gain employment." **Mentor**

It benefits Mentors as well as mentees

As well as benefitting learners, being a Maths Mentor in a vocational workshop can have lots of positive outcomes for prisoners. The Mentors involved in our vocational project found that the training helped them to recognise and improve their own maths skills and learn how to apply these to industrial work. The project also helped them to develop new resources and approaches to mentoring, which helped them to engage more prisoners in maths activities.

"I learned a lot about my own skills and how to apply them to work situations." **Mentor**

"I learnt how to make the students that I mentor more interested in maths." **Mentor**

"It deepened my understanding of embedding maths in a functional manner."

Mentor

It can help prisons to meet current government priorities

In "**Unlocking Potential: A review of education in prison**", Dame Sally Coates recommended that education in prison should give individuals the skills they need to unlock their potential, gain employment, and become assets to their communities, in order to support effective rehabilitation and reduce reoffending. Her report encouraged all who work in a prison – not just education staff, but also instructors in the gym and workplace and peer mentors – to recognise the value of their interactions with prisoners. "Unlocking Potential" specifically called for basic skills development to include one-to-one support from other prisoners and to be embedded in workshop or other work settings (e.g. kitchens and gardens).

"In the Ofsted annual report in 2016, one of the things coming from the prison inspections was the lack of recognition of Functional Skills in work areas. There are lots of opportunities for embedding maths in workshops, but none of these were being captured. Maths Mentors can help prisons take advantage of these missed opportunities and it has benefits not just for education staff but also industries staff."

Cluster HOLSE, West Midlands

However, our pre-project activity with industry/workshop managers and other staff identified barriers to this, including staff motivation, confidence and capacity. These barriers resulted from the possible impact on production targets, limited staff skills in maths and lack of teaching qualifications or experience. Staff agreed that using the existing maths skills and capacity of many prisoners could present a solution to these issues, and that Maths Mentors could help to "plug the gaps", supporting their peers to improve their maths skills in vocational contexts.

"Probably half of our prisoners are at Level 1 or below, so if we were to take all those into a classroom, we'd need an education department half the size of the prison. Embedding maths in the vocational areas that we have in the establishment opens it up to a vastly greater number of our learners, and is probably in a format that is a lot more practical in terms of what learners will be using their skills for in the future."

Cluster HOLSE, West Midlands

HOW TO EMBED MATHS IN VOCATIONAL CONTEXTS

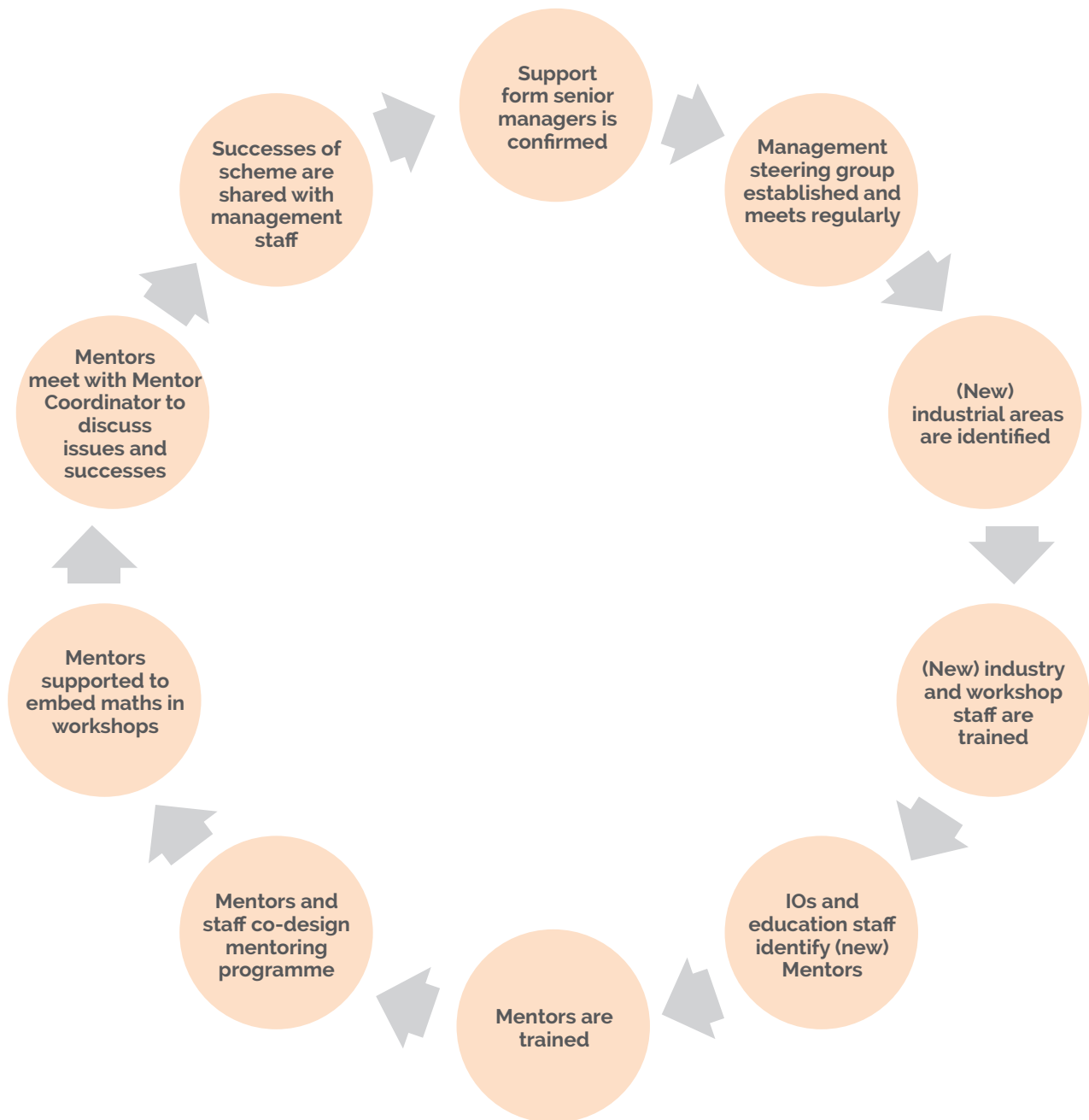
This section explains the different approaches you can take to embedding maths in the vocational workshops in your prison. First, it talks you through how to get management support and set up your Maths Mentors scheme. It goes on to explain how Mentors should be trained, what this should include and some resources you can use in your training programme. It then talks through the different models you can use to run your Maths Mentors scheme and embed maths in your vocational workshops.

Based on our project and evaluation, an effective Vocational Maths Mentor programme must include:

- Engaging the Prison Governor and other staff through recognised routes (e.g. from Heads of Learning and Skills via the Quality Improvement Group)
- Establishing a management steering group (including a rep from the prison education department)
- Identifying target vocational areas and staff, preferably via Industries Managers
- Delivering initial training for industry and workshop staff
- Identifying Maths Mentors who can work in vocational contexts
- Delivering training for Maths Mentors to embed in vocational workshops
- Engaging Mentors and staff in the co-design of the mentoring programme (including agreements on mentor role, time commitments, activities, outputs and materials)
- Delivering the programme
- Coordinating and supporting Mentors, including identification of issues and barriers with possible solutions
- Sharing knowledge and reporting outcomes

The importance of gaining ongoing support from managers cannot be emphasized too strongly. As the programme is based on a two-level delivery model (staff and mentors), the majority of industry and workshop staff have limited experience of teaching, this programme needs support at all levels across the prison to remove barriers. This support needs to be ongoing, so we recommend a cyclical approach, establishing an ongoing and regular model of review, delivery and knowledge sharing.

Vocational Maths Mentors programme model



Getting started

In order to run a successful Maths Mentors scheme, it is important to get senior management, prison staff and education staff on board from the beginning. This guide and the other Maths Mentors booklets (which can be found on the Virtual Campus) can help you

to make the case for having a Maths Mentors scheme in your prison. The previous section on why prisons should embed maths in vocational areas should be particularly useful in getting senior managers on board. It should help them to see the potential benefits for prisoners, staff and the prison as a whole.

"It's got to be driven from the top. Any establishment in which we've done this successfully, we have the governors and their senior management teams 100% behind it." **Cluster HOLSE, West Midlands**

Once the support of senior management and other staff has been agreed, the first group of mentors must be identified. We recommend asking prisoners who have a helpful, supportive manner and are confident in their maths skills to be Mentors. Mentors do not need to have a formal maths qualification, but they should have a positive attitude about maths.

We have found that the project works best if the prison can identify and support a Mentor Coordinator who is willing to take responsibility for Mentors and give regular feedback to prison staff on the successes of the scheme and any issues that arise. We also recommend that Mentors meet regularly to share experiences, develop their skills and identify the successes and challenges of the scheme.

Training your Instructional Officers

Before you train your Mentors, it is important to get your Instructional Officers on board. Many IOs will already be convinced of the benefits of improving prisoners' maths skills and confidence, and will be supporting the prisoners in their workshops to practise their maths. However, in our Vocational Maths Mentors project, it was clear that some IOs were not very confident in their own maths ability, let alone to support others to improve their maths skills.

To overcome this, you could run an initial briefing or training session with IOs to clarify their role in the scheme, recognise the importance of embedding maths in vocational areas and identify their own skills which can support this. This training can also encourage IOs to think about the benefits of working with Maths Mentors and how they can capitalise on their skills, knowledge and ability to engage with other prisoners. Emphasise IOs' main role will be to ensure that Mentors have the time to carry out their activities; outside of this, IOs can choose to help coordinate Mentors and their activities, promote the scheme across the prison or help select appropriate resources for their workshop, but this all depends on their confidence and motivation. Everyone can have a role to play which suits their situation.

Our Vocational Maths Mentors training made a big difference to the way that IOs thought about maths in vocational workshops and their skills to support this.

"Our staff on the first day, they didn't really want to be there. When I observed them in the final session, the change in them was absolutely incredible. They never realised that they could support maths mentors when they felt that they didn't have great maths skills themselves. Since then, one of the staff has developed a whole range of resources that he can use with his guys in horticulture." **Regional HOLSE, East of England**



1 in 3 realised the importance of embedding maths in vocational workshops

1 in 4 realised the importance of maths in everyday life



Training your Maths Mentors

Before your Mentors start supporting prisoners with their maths, we recommend involving them in a short, one-day training programme. This should aim to help Mentors understand their role and give them the skills and confidence to act as a Maths Mentor. It should involve discussions about the reasons for having mentors, what makes a good mentor, boundaries and responsibilities, and active listening skills, as well as providing examples of activities that Mentors can carry out with mentees.



1 in 4 felt more confident to support maths in vocational workshops

1 in 4 felt more confident to support others with their maths skills

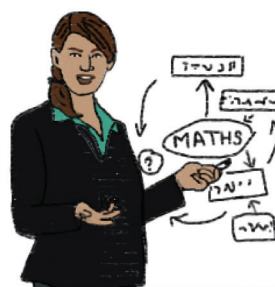


The Maths Mentors Handbook (2nd Edition) includes a training programme and lots of resources that you can use to train your mentors. These can be used by education or prison staff who are confident in training; at least one trainer needs to be maths confident. You can also use activities from the other Maths Mentors booklets (Whole Numbers, Money, Time and Distance, and Mathematical Magic) in your training programme. The Handbook and Maths Mentors booklets can all be found on the Virtual Campus.

"It's fun and will help you on the road to be a great mentor." **Mentor**



1 in 3 had developed new resources



Half said it improved their knowledge on how to embed maths in vocational workshops

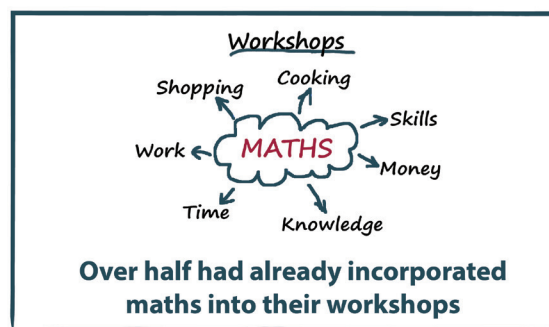
One of the main things that participants valued about the training we ran for the Vocational Maths Mentors project was the opportunity for Mentors, Instructional Officers and education staff to come together and discuss the best ways of putting the activities into practice. So, if

you're not able to run a 'formal' training session, you might want to think about arranging regular meetings for Mentors, Instructional Officers and education staff to talk about the scheme, its successes so far and how any challenges can be overcome.

"Being able to discuss roles with Instructional Officers and coordinators was really useful." **Mentor**

"I enjoyed listening to the ideas and suggestions raised as to how the scheme is likely to work. Some very good suggestions came out of the discussions."

Instructional Officer

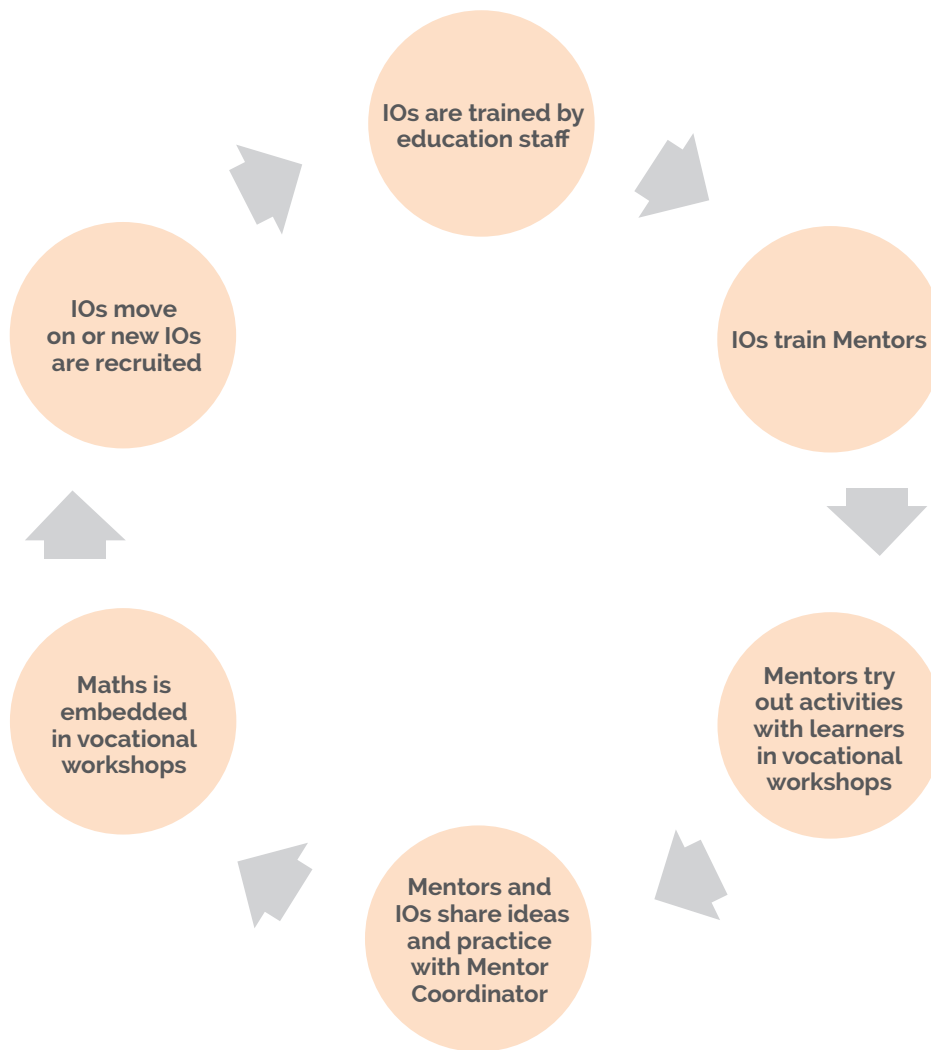


Different approaches

The prisons we worked with during the Vocational Maths Mentors project took different approaches to running their Maths Mentors scheme and to embedding maths in vocational workshops. We've included the different approaches here so you can think about which models (or which parts of each model) would suit your prison best.

1. Train the Trainer model

In this model, education staff do not train mentors directly. Instead, education staff train Instructional Officers and other prison staff to train the Maths Mentors they identify in their workshops. Education staff should take IOs through the training they should run with their Mentors and provide resources for Mentors to use with mentees. As a result, the model looks like this:



Benefits

- Gains IO and vocational staff support for the programme
- Gives IOs and vocational staff ownership of programme
- Can help IOs and vocational staff to improve own maths skills and confidence
- More sustainable than delivering training directly to Mentors, as staff tend not to move around prisons as much.

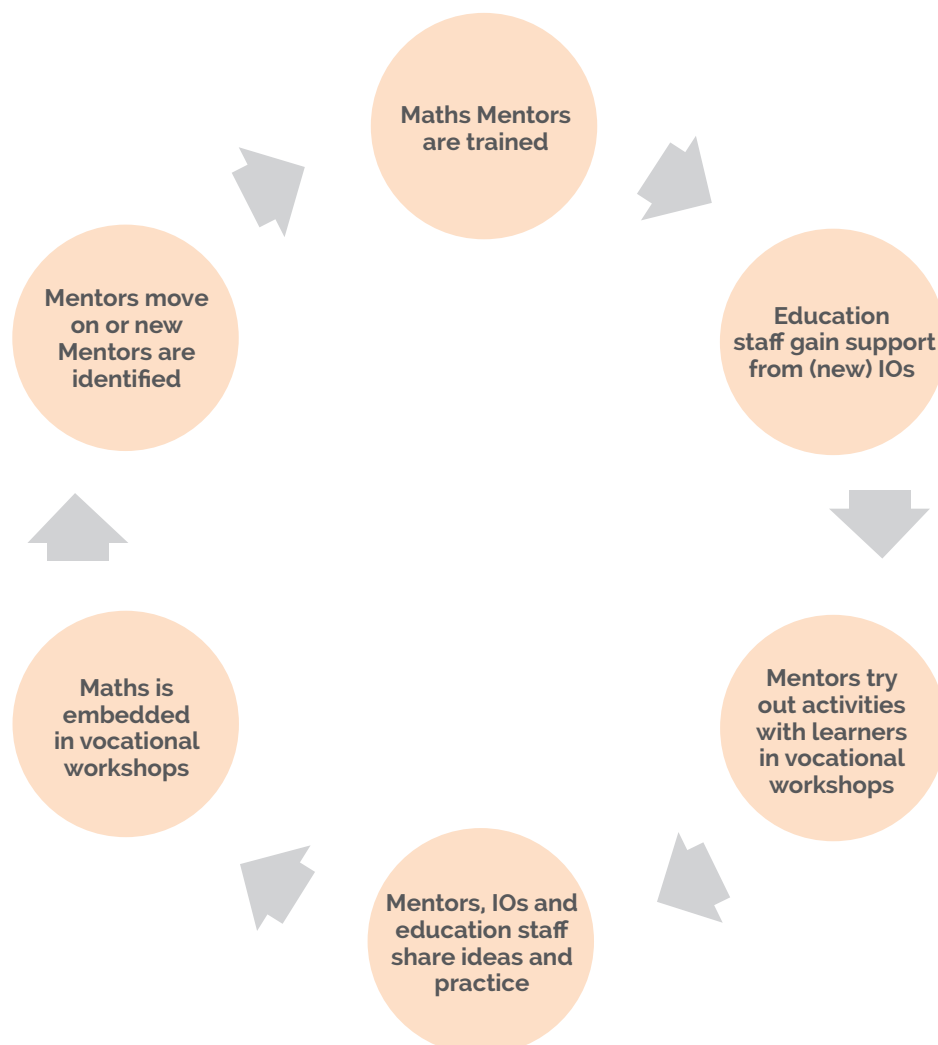
Challenges

- Involves more time commitment from staff (both education and industrial) up front.
- IOs and vocational staff need to have the confidence to pass the training onto Mentors.
- IOs and vocational staff need to prioritise training over production targets.

2. Direct training for Maths Mentors

In this model, education staff work directly with Mentors to equip them with the skills and confidence needed to embed maths in vocational workshops. Education staff should deliver a training session to Mentors and provide them with resources to use with mentees. They will also need to ensure that IOs are on board with the scheme so that Mentors can embed maths in vocational workshops.

In our Vocational Maths Mentors project, this Maths Mentors scheme model was more successful than the Train the Trainer approach. This was because the Mentors were more confident to support prisoners with their maths learning and Instructional Officers could provide support as and when required, without needing to run training sessions with Mentors. However, the success of this model may depend on the average stay of your prisoners and Mentors – if you have a relatively quick turnaround then your Mentors may not have much chance to embed maths in workshops before they are released or moved to another prison.



Benefits

- Mentors gain direct training to support prisoners in workshops
- Gives Mentors ownership of programme
- IOs can provide support as and when required, without needing to run training sessions with Mentors
- Can overcome challenge of low confidence with maths amongst IOs and vocational staff
- Likely to have less of an impact on production targets

Challenges

- Involves more time commitment from staff (both education and industrial) up front.
- IOs and vocational staff need to have the confidence to pass the training onto Mentors.
- IOs and vocational staff need to prioritise training over production targets.

3. Highlighting the maths in vocational activities

As well as different models for running a Maths Mentors scheme, there are different ways for your Mentors to embed maths in vocational workshops. The approach you choose may vary depending on the nature of the workshop and the time available for mentoring.

One way in which Mentors can start to embed maths in vocational workshops is by supporting prisoners to recognise the maths skills they already use in their day-to-day activities. This might involve creating posters to put up in workshops, having group discussions with prisoners about the skills they use, or using prompts (e.g. photos) with individual learners to help them think about the maths in their work.

Benefits

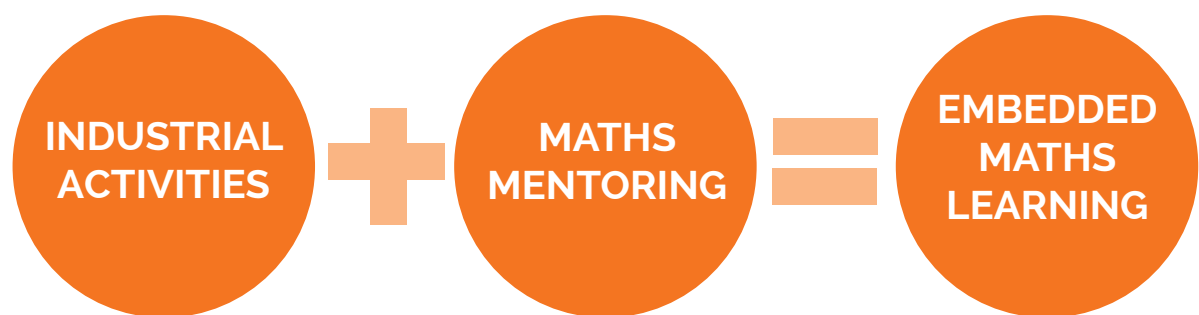
- Can help prisoners recognise the importance of maths
- Can help prisoners overcome any ideas that they 'can't' or 'don't do' maths
- Can be effective as a way to initially engage prisoners in maths learning

Challenges

- Can be challenging to get prisoners to engage if they are focussed on their work
- Limited scope for doing more in-depth maths learning or activities with learners
- May require Mentors to source or create activities to help learners identify maths in their work

4. Using resources to embed maths in industrial activities

Some of the prisons involved in the Vocational Maths Mentors project encouraged their Mentors to work with prisoners while they carried out their industrial activities. These Mentors used maths resources and materials related to the industry they were working in to help mentees recognise the maths skills they used in their work. This helped mentees to understand the relevance of maths and realise that they needed maths for work. As a result, learners were more interested in engaging with maths and improving their maths skills.



Benefits

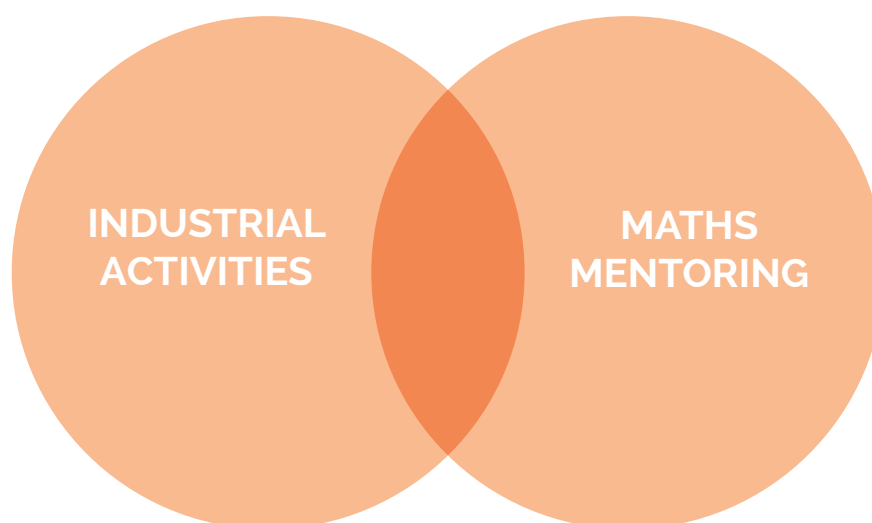
- Maths can be embedded in prisoners' activities with little distraction from work
- Can help prisoners recognise the importance of maths
- Can be effective as a way to initially engage prisoners in maths learning

Challenges

- Can be challenging to get prisoners to engage with resources if they are focussed on their work
- Limited scope for doing more in-depth maths learning or activities with learners
- Requires Mentors to source good resources for different industrial areas

5. Providing time for mentoring in vocational workshops

Another approach to embedding maths in vocational workshops is to provide a space and time for mentoring during industrial activities. Some prisons found that they could set up an area for Mentors to work with mentees and could allocate times for prisoners to access this support. Mentors then worked through resources and materials which were relevant to prisoners' vocational workshops and helped them to recognise the maths they used in their work. This overlap between maths mentoring and industrial activities helped learners to understand mathematical problems.



Benefits

- Can deliver more in-depth and focussed maths learning activities to prisoners
- Can tailor activities to learners' needs and address particular challenges they have with maths
- Individualised approach can help prisoners understand importance of maths to work and wider lives

Challenges

- Takes time away from industrial activities
- Need to have a workshop with suitable space to run mentoring activities
- Prisoners may be reluctant to engage in front of their peers
- Requires Mentors to source good resources for different industrial areas

6. Running ad hoc sessions during 'slow times'

Staff and Mentors could work together to develop maths sessions to run during "slow times" in workshops. This way, any spare time at the beginning or end of the day can be filled with some maths learning or activities. Having some sessions or activities planned means that staff and Mentors can take advantage of opportunities as they arise. This might involve setting maths challenges for groups or teams and getting them to race one another to the solution.

Benefits

- Uses spare time in workshops productively
- Does not distract from production targets in workshops
- Can involve fun activities which encourage prisoners to participate in further maths learning

Challenges

- Requires staff and Mentors to have time to plan sessions or activities in advance
- May find that the same prisoners engage and find the solutions each time
- Prisoners may be reluctant to engage in front of their peers

7. Providing informal support on the wing

Alongside delivering activities in vocational workshops, Mentors can provide informal support to learners on the wings. This can complement and build on the other activities and help prisoners to consolidate or develop their learning. This support might involve providing learners with resources or 'homework' to complete in their own time, working through particular problems that learners struggle with, and helping learners think about how their maths skills apply to their vocational workshop.

Benefits

- Does not distract from production targets in workshops
- Can tailor activities to learners' needs and address particular challenges they have with maths
- Can deliver more in-depth and focussed maths learning activities to prisoners

Challenges

- May require some intensive support from Mentors
- Requires Mentors to source good resources for different industrial areas
- Could be challenging to use this as the basis for embedding maths in workshops

Challenges and how to overcome them

Engaging and motivating learners

One of the most common challenges that Mentors face is how to engage and motivate learners who do not see the importance of maths. One of the best ways to overcome this is to find out what learners are interested in, or what they want to achieve while in prison, and make them see how maths can help them with this. Explain how having good maths skills is important to employers and can help them get a job on release.

"My business operates in HMP Hewell and HMP Drake Hall, and hopefully this summer I'll be operational within HMP Featherstone. A good understanding of maths is an important part of my business as all employees need to work with stock levels and order picking. Many of our offenders have entry level maths and English and we ask them to increase to a minimum of level 1 whilst in the workplace. For those who apply themselves within the prison we then offer ROTL work leading to full time employment within our business or one of our contacts." **Managing Director, Inside Out Ventures Ltd.**

You can do this through an initial one-to-one session with a learner. Speak to them about their hobbies, past work experience and goals for their time in prison. You can then pick out maths resources or activities which relate to your mentees' interests or goals, for example, a dartboard game or gardening activity. You can use the resources in the pack which accompanies this guide. Once a learner starts to see the relevance of maths to their everyday and work lives, it should be easier to engage them in maths activities.

"It did take time to get the learner to change the way he thought about maths, but by the end of the session he had improved in confidence. He also learnt different methods." **Mentor**

Some learners will have had very negative experiences while learning maths in the past. For these learners, it's important that Mentors are seen as approachable and supportive, but not patronising. You need to make your mentees feel comfortable enough to talk about their barriers to learning maths and think about how you can tackle these together. Sharing your own experiences of learning maths could be a good way of encouraging a learner to speak about their previous maths learning.

If learners are reluctant to engage with Mentors on a one-to-one basis, then you could try some group activities in workshops. Splitting learners into groups or teams and getting them to compete against each other on maths problems can be an effective way of motivating them to learn. Learners could also create their own maths problems for the teams to work on.

Promoting your Maths Mentors scheme around the prison can also be a good way of engaging learners. You could use posters, banners or flyers to advertise the scheme and mention it at any meetings you attend with staff or prisoners. This can not only make more prisoners aware of the scheme, but also makes it more acceptable and normal for them to ask Mentors for support with their maths.

Staff time to support mentors

Staff in our project sometimes found that they had little time to support Mentors, especially when they were in workshops which had targets to meet. Getting senior management support for your scheme at the beginning can be crucial in ensuring that staff are given the time to support Mentors and mentoring activities. It will help them to recognise the importance of Maths Mentors and prioritise this alongside workshop activity. Once a scheme is up and running and shown to be successful, it will likely become embedded within the other activities run by the prison.

One way to reduce the pressure on staff time is to identify a Mentor Coordinator. This person can be the key contact for Mentors, providing support and arranging regular meetings for them to share practice and resources. Alternatively, you could identify a "Super Mentor" if you have a prisoner with high existing maths skills and/or maths teaching experience. A Super Mentor could be used to develop higher level maths activities to prisoners who want them, as well as support other Mentors to develop their own skills and delivery methods.

Mentors moving on

A key challenge for prisons can be the turnover of their prisoner population, which means that Maths Mentors are either released or transferred shortly after being trained. One way to overcome this issue is to deliver regular training sessions so that your prison always has a cohort of active Mentors. This will also mean that if Mentors are moved between workshops, there should always be another Mentor available to replace them.

To encourage prisoners to become Maths Mentors, your prison could consider offering incentives to join the scheme. This might include offering a mentoring qualification, extra phone credit, or even moving onto a higher pay band. Having senior manager support could help you to put these incentives in place.

IOs having confidence to support maths

Some IOs may still have concerns about their ability to support maths learning in their workshops following the initial training. You might want to consider offering further opportunities for IOs and vocational staff, as well as other staff from across the prison, to improve their maths. You might consider developing

follow-up training days which encourage staff to explore maths problems in more depth, while others may wish to access opportunities to gain formal maths qualifications, such as Functional Skills or GCSE Maths.

Regular meetings between Mentors, IOs and education staff can also reassure IOs that others have the maths skills needed to run the scheme, if they are lacking in confidence. Alternatively, if there are some members of staff who have good levels of maths and enjoy supporting others, they could work with IOs and other vocational staff as peer mentors themselves, helping them to improve their confidence and skills in maths. These staff might benefit from having the opportunity to train as teachers, for example by participating in a Preparing to Teach in the Lifelong Learning Sector (PTLLS) course.

"The training has made them gel better as a team. They support one another and they're a great asset to the establishment."

Regional HOLSE for East of England

ACTIVITIES AND RESOURCES TO USE WITH LEARNERS

There is a huge range of high-quality free maths resources available (including material produced by prison staff and mentors involved in the project). We have included some examples in the pack which accompanies this guide. We trialled these during our project, and in an activity called “Will This Work?” and supported mentors and staff to make decisions about how to choose the right resources to use with learners. Together we developed a large set of criteria. Staff and mentors “scored” the materials against the following criteria:

- **Will the resource be interesting to learners?**
 - Is it lively / attractive / well-presented?
- **Is the resource age-appropriate, i.e. focussed on adult (post-16) learners?**
 - Is the language appropriate for adults, instead of school children?
 - Does it include activities that adults are likely to do or find interesting?
 - Are the illustrations or images of adults?
- **Is the material or activity inclusive – does it reflect the diversity of the learner group?**
 - Do the issues and images reflect the learners you work with? Think about age, gender, ethnicity, disability etc.
 - Is the resource accessible to adults with different learning needs?
 - Does the resource enable a wide variety of learners to make a start on the problem? Could they take it much further if they wanted to?
- **Will the resource support learners to become (more) aware of how maths can help them in their everyday lives, both inside and outside prison?**
 - Will the activity support learners to become aware of the maths they already use in their everyday lives?
- **Will the resource help learners to realise the usefulness of maths?**
- **Will mentors need to “explain” the maths to learners, or does the resource encourage learners to think for themselves?**
 - Do the materials support “active” learning and enable the mentor / staff to act more as coaches than “explainers”?
- **Will the resource help learners get to understand mathematical ideas?**
 - Do the resources actively support learners to explore and resolve difficulties or misunderstandings?
 - Do they help learners to consolidate mathematical skills, e.g. by challenging them to use those mathematical skills in some new-to-them contexts?
 - Do they help learners to use / develop mathematical skills and knowledge that will be immediately useful to them in their everyday / working lives?
 - Are the contexts for learning realistic / authentic?
 - Will the activities stretch learners mathematically?

- **Does the resource help learners to develop skills or knowledge other than maths?**

- For example, English / history / science?

- **Is the resource easy for mentors to use?**

- Will the mentor need to spend a lot of time working out how to use the resource?
- Will mentors / staff need to spend time photocopying / cutting out activities before use?
- Will mentors need to supply any equipment, e.g. calculator, paper tape measure, dice?
Can you get these in your prison?

- **Could many / most learners complete the activity in about 20 minutes?**

- Could the activity be fitted into a short slot at the start or end of a day's work?

- **Would the activity encourage learners to continue to work on it when they're back on the wing?**

On the opposite page, you'll find the 'Will this work?' activity which mentors and staff used to score materials. This can help you choose the right resources to use with your learners. Few resources will meet all of the criteria, but the table can help you to think about which materials will work for different learners at different times.

Will these activities/resources work?
Give each a score 0 - 5

Name of your workshop:

[illegible]

The resource pack

The pack which accompanies this guide includes lots of resources that have been rated highly by staff and mentors involved in the project.

Some of these resources were already developed and free to use. Many of these have been re-purposed by prison IOs and Mentors, who also developed their own resources. All of the resources have been trialled by staff and mentors and the ones included here have been selected based on their feedback throughout the project.

We've organised them under these headings, which are colour-coded in the guide (a full list is included on pages 25-36):

- General and everyday activities
- Catering
- Gardening
- Printing
- Production
- Sports
- Tailoring
- Waste management
- Other workshops

As you can see, the pack doesn't include resources for every single workshop run by prisons – we have focussed on the ones which were most common in the prisons that took part in the project. If you work in a vocational area not included in the pack, then why don't you use these resources as inspiration to create your own?

You can also ask your industries or education manager to look for other resources online. Here is a list of useful websites which include lots of free, high quality maths resources relevant to lots of different vocational workshops:

BBC Skillswise includes short videos showing how Maths and English are used in various workplaces, together with games and quizzes.
www.bbc.co.uk/skillswise/job-skills

The **Excellence Gateway** is a searchable repository of over 7000 resources including learning materials which has a section dedicated to offender learning. <https://offender-learning.excellencegateway.org.uk>

Improving Learning in Mathematics includes materials for use with learners and CPD materials for teachers. The mathematics level is roughly GCSE.
www.stem.org.uk/elibrary/collection/2938

Maths Eyes aims to support learners to see the mathematics they do every day so that mathematics becomes real and meaningful.
www.haveyoutgotmathseyes.com

Maths in Work includes videos showing how maths is used in a wide range of jobs.
www.ncetm.org.uk/resources/11329

NRICH provides a searchable e-library of mathematical resources. You can search for vocational areas to find resources relevant to your workshop. <http://nrich.maths.org>

Starter For Ten is a set of activities created by and with vocational teachers.
www.stem.org.uk/elibrary/collection/4200

STEM Learning provides a searchable e-library of Science, Technology, Engineering and Mathematics teaching and learning resources at all levels up to and including Level 3.
www.stem.org.uk/resources

RESOURCES REFERENCE TABLES

The following table sets out the resources included in the pack, along with notes on the approximate maths levels of each resource to help tutors and mentors decide which to use with their mentees.

GENERAL RESOURCES

Resource name	Notes
FACTORS AND MULTIPLES PUZZLES	<p>This could be a differentiated resource for Entry 2 to Level 2 learners.</p> <p>E2: Identify and use whole numbers with up to two significant figures. Odd and even numbers/numbers less than or more than 20.</p> <p>E3: Solve practical problems involving multiplication and division by 2, 3, 4, 5 and 10.</p> <p>L1/L2: Identify and use positive numbers of any size in practical contexts.</p> <p>GCSE/L3: Use the concepts of factor, multiple, prime number, triangular number</p> <p>Related topics:</p> <ul style="list-style-type: none">• The four rules of number, i.e. multiplication, division, addition and subtraction.• Odd and even numbers.• Square numbers, factors, multiples, prim numbers and triangular numbers.
ALWAYS, SOMETIMES, NEVER	<p>L1: Add, subtract, multiply and divide whole numbers using a range of strategies.</p>
STAGES, QUALIFICATIONS,	<p>This is a guidance sheet on the stages and qualification levels</p>
LIMERICK	<p>GCSE/L3: Use concepts of factor, multiple, power</p> <p>GCSE/L3: Identify and use formulae.</p> <p>GCSE/L3: Express numbers as formulae</p> <p>Related topics:</p> <ul style="list-style-type: none">• Four rules of number.• What is a factor, power, multiple?• Using formulae.

Resource name	Notes
BUS FARE TO WORK	<p>E3: Complete simple calculations involving money and measures.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Four rules of number. ● Decimal numbers. ● Using decimals everyday life – e.g. money.
TIME AT WORK AND PAY	<p>L1/L2: Use the four rules of number to solve problems including decimal numbers.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Four rules of number. ● Decimal numbers in everyday life, including money. ● How to multiply, divide, add and subtract decimal numbers.
TIME AT WORK	<p>E3/L1: Use addition, subtraction, multiplication and division in everyday contexts.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Four rules of number. ● Using four rules of number in everyday, practical situations.
WORK ATTENDANCE	<p>E2: Addition and subtraction of one and two digit numbers</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● How to add and subtract using two digit numbers.

CATERING

Resource name	Notes
FOOD HYGIENE	<p>L1: Identify and use negative numbers in practical contexts.</p> <p>Related topics:</p> <ul style="list-style-type: none"> Using a number line
FOOD PREPARATION AND COOKING	<p>Date coding and stock rotation</p> <p>E1/E2: Writing and comparing dates in a range of formats.</p> <p>Weighing ingredients</p> <p>E3/L1: Reading and interpreting information from scale.</p> <p>E3/L1: Comparing units of metric measures for weight.</p> <p>Measuring liquid ingredients</p> <p>E3/L1: Reading and interpreting information from scale</p> <p>E3/L1: Comparing units of metric measures for weight.</p> <p>L1: Expressing quantities as a fraction of the total amount.</p> <p>Adjusting quantities</p> <p>L1/L2: Understand, use and calculate ratio and proportion.</p> <p>Temperature</p> <p>L1: Reading and interpreting data from tables, graphs and charts.</p> <p>L1: Identify and use negative numbers in practical situations.</p> <p>Related topics:</p> <ul style="list-style-type: none"> Place value Decimal numbers Measurement – weight, metric units Reading measurements from scale Equivalent measures for metric units of weight/capacity Fractions Ratio and proportion
BOXES AND BOTTLES	<p>L1/L2: Finding the area and volume of cubes and cuboids.</p> <p>Related topics:</p> <ul style="list-style-type: none"> Shapes Measurement – length and width (metric measures) Area Volume

GARDENING

Resource name	Notes
FLOWER SHOW	<p>L2/GCSE: Find the area and perimeter of common shapes, including finding the circumference of a circle.</p> <p>Related topics:</p> <ul style="list-style-type: none"> • Measurement- metric units • Shape • Area and perimeter • Diameter and radius of a circle
MAGIC PLANT	<p>L1/L2: Solve problems requiring calculation with common measures, including money and time.</p> <p>Related topics:</p> <ul style="list-style-type: none"> • Four rules of number • Measurement - metric units • Time - hours and minutes
THE AMAZING SPLITTING PLANT	<p>L2/GCSE: Use formulae to find solutions to problems.</p>
THE TREE AND THE GREENHOUSE	<p>L2/GCSE: Interpreting and comparing metric measurements for length to solve worded problems.</p> <p>Related topics:</p> <ul style="list-style-type: none"> • Measurement – length: metric units • Comparing length
TREE TOPS	<p>L2/GCSE: Interpreting information from tables, graphs and charts and evaluating to make conclusions.</p> <p>Related topics:</p> <ul style="list-style-type: none"> • Tables, graphs and charts. • Profit/loss and comparing large numbers.
MORE OR LESS	<p>L3: Make sensible estimates for a range of measures. Carry out multi-stage calculations with numbers of any size.</p> <p>Related topics:</p> <ul style="list-style-type: none"> • Estimation • Measurement – weight, capacity, time, area, volume • Basic calculations

Resource name	Notes
PLANTING PLANTS	<p>L1/L2: Use area and perimeter to solve practical problems. Solve problems requiring calculation with common measures, including money, time, length, weight, capacity and temperature. Create sketches and diagrams to portray mathematical information.</p> <p>Related topics:</p> <ul style="list-style-type: none"> • Area and perimeter • Measurement – length metric units

PRINTING

Resource name	Notes
PRINTING PACKAGE	<p>E3/L1: Recognise and use 2D and 3D shapes. Measuring in metric units. Find the area of a shape.</p> <p>Related topics:</p> <ul style="list-style-type: none"> • Measuring in metric units • Area • 2D and 3D shapes
ORDER	<p>L1 : Add, subtract, multiply and divide whole numbers using a range of strategies.</p> <p>Related topics:</p> <ul style="list-style-type: none"> • Four rules of number – 3 digit by 3 digit • Worded problems
INK MIXING	<p>L1: Solve problems requiring calculation, with common measures, including money, time, length, weight, capacity and temperature. Add, subtract, multiply and divide whole numbers using a range of strategies.</p> <p>Related topics:</p> <ul style="list-style-type: none"> • Four rules of number • Weight – metric units • Worded problems
PACKAGING	<p>L1: Solve problems requiring calculation, with common measures, including money, time, length, weight, capacity and temperature. Add, subtract, multiply and divide whole numbers using a range of strategies.</p> <p>Related topics:</p> <ul style="list-style-type: none"> • Four rules of number • Weight – metric units • Worded problems

PRODUCTION

Resource name	Notes
SHOPPING AROUND: CONTAINERS	<p>L1/L2: Recognise and use 2D representations of 3D objects. Find the area, volume and perimeter of common shapes.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● 2D and 3D shapes ● Area, perimeter and volume ● Length, width, depth
GETTING THERE: WORKING FOR EFFICIENCY	<p>L1/L2: Interpreting scale and distance to draw conclusions.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Imperial and metric units for length/distance. ● Scale drawings
GETTING THERE: ORDERING	<p>E3/L1: Solve problems requiring calculation with common measures, including money, time, length, weight, capacity and temperature.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Time ● Worded problems.
DRAIN WASTE KITS	<p>L2: Carry out calculations with numbers of any size in practical contexts.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Four rules of number with digits of any size ● Decimal numbers in every day context, including money.
CUTTING TABLE	<p>L1/L2: Solve problems requiring calculation with common measures, including money and time.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Calculating time. ● Converting minutes to hours and vice versa. ● The four rules of number.
PICKING AND PACKING	<p>L1/L2: Carry out calculations with numbers of any size in practical contexts.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● The four rules of number. ● Worded problems
CONTINUOUS BAND SEALER	<p>L1/L2: Solve problems requiring calculation with common measures, including money, time, temperature.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Calculating time: minutes, hours and seconds ● Temperature ● Four rule of number

Resource name	Notes
TOILET ARMS	<p>L2: Solve problems requiring calculation with common measures, including money, weight. Carry out calculations with numbers of any size in practical contexts.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Four rules of number. ● Using the four rules of number. ● Measurement - Weight

SPORTS

Resource name	Notes
SPORTS LEADERSHIP	<p>E2/E3: Reading time in seconds, minutes and hours.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Time in minutes, hours, seconds
ANGLE OF SHOT	<p>L3: Rearrange and use formulae, equations and expressions.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Formulae, equations and expressions
MATCH THE MATCHES	<p>L1/L2: Use and interpret statistical measures, tables and diagrams for discrete and continuous data. Use statistical methods to investigate situations.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Tables, graphs and charts
DECATHLON	<p>L3: Rearrange and use formulae, equations and expressions.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Formulae, equations and expressions
MEDAL MUDDLE	<p>L2: Use and interpret statistical measures, tables, and diagrams for discrete and continuous data.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Tables, graphs and charts and how to interpret information to draw conclusions – data handling.

Resource name	Notes
NUTRITION AND CYCLING	<p>L2: Reading and interpreting data from tables, graphs and charts. Solve problems requiring multi-staged calculations with common measures, including money, time, length, weight, capacity and temperature.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Reading and interpreting information from tables. ● The four rules of number, \times \div $-$ $+$ ● Using the four rules of number to perform multi-staged calculations involving money, weight, time. ● Calories ● Temperature ● Four rule of number
OLYMPIC MEASURES	<p>L1/L2: Reading and interpreting time, distance and speed. Interpreting metric and imperial units of measure.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Time, distance and speed ● Metric and imperial units of measure.
OLYMPIC RECORDS	<p>L1: Extract and interpret information from tables, diagrams, charts and graphs;</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Tables, graphs and charts. ● Drawing and interpreting graphs, tables and charts will help learners with this resource if covered first.
TRACK DESIGN	<p>L2: Identify, use and calculate ratio and proportion, including problems involving scale. Find the area and perimeter of common shapes.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Ratio and proportion ● Scale drawings ● Area and perimeter of common shapes, including circles.

TAILORING

Resource name	Notes
SPORTS BAG	<p>L1/L2: Convert metric units of measure in the same system. Find the area and perimeter of common shapes. Construct geometric diagrams, models and shapes.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Converting between metric units of measure, cms and metres. ● 2D /3D shapes ● Area and circumference of common shapes.
FASHION ENTREPRENEUR	<p>L1: Solve problems requiring calculation with common measures, including money, time, length, weight, capacity and temperature.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Calculating time
SEWING	<p>E3/L1: Estimating length.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Length
DESIGNING TABLEMATS	<p>L1/L2: Work out areas and perimeters in practical situations. Construct geometric diagrams, models and shapes.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Length – metric measurements, cms and metres. ● Area and perimeter.

WASTE MANAGEMENT

Resource name	Notes
WORKING WITH CHEMICALS: WASTE MANAGEMENT	<p>L1/L2: Extracting and interpreting information from tables, graphs and charts. Use statistical methods to investigate situations. Finding a percentage of an amount.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Pie charts ● Graphs, tables, charts ● Percentages
RETHINKING RECYCLING	<p>L1: Weight – Solve problems requiring calculation with common measures, including money, time, length, weight, capacity and temperature. Convert units of measure in the same system, i.e. grams to kilograms and vice versa.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Weight ● Converting kilograms to grams and vice versa ● Worded problems – calculating weight

OTHER WORKSHOPS

Resource name	Notes
PAINTING PREPARATION	<p>E3/L1 Identifying units of measure for length pg. 113/114 E3/L1 Measure and record units of measure for length. Pg. 113/114 L1 Rounding units of measure for length to the nearest mm, m or cm. pg. 113 Pg113 onwards: L1/L2 Finding the area and perimeter of a shape. E3/L1 Using estimation to find approximate answers. L1/L2 Solve problems requiring calculation with common measures, including money, time, length, weight, capacity and temperature.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Units of measure for length and how to round measurements to the nearest cm, m, mm ● Measuring objects using cm, mm, m ● Estimation ● Area and perimeter ● Capacity - litres ● Worded problems which include money ● How to multiply, divide, add and subtract decimal numbers.
WORKING SKILLS FOR CONSTRUCTION	<p>E3 Identifying metric units of measure for length, i.e. mm, cm, m E3 Measuring Length L1 Recognise equivalent measures – convert between metric units of measure, i.e. cms to metres and vice versa. L1 Solve problems requiring calculation with common measures, including money, time, length, weight, capacity and temperature. L1 Find the area and perimeter and volume of shape. L1 Use ratio and direct proportion.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Measurement – length ● Converting units of measure in the same system ● Worded problems – including time, length, money ● Area, perimeter and volume ● Ratio and direct proportion
BUS FARE TO WORK	<p>E3: Complete simple calculations involving money and measures.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Four rules of number. ● Decimal numbers. ● Using decimals everyday life – i.e. money.

Resource name	Notes
TIME AT WORK AND PAY	<p>L1/L2: Use the four rules of number to solve problems including decimal numbers.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Four rules of number. ● Decimal numbers in everyday life, including money. ● How to multiply, divide, add and subtract decimal numbers.
TIME AT WORK	<p>E3/L1 : Use addition, subtraction, multiplication and division in everyday contexts.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Four rules of number. ● Using four rules of number in everyday, practical situations.
WORK ATTENDANCE	<p>E2: Addition and subtraction of one and two digit numbers</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● How to add and subtract using two digit numbers – introduce figures first and then worded problems.
YOU CHOOSE	<p>L1: Comparing quantities in terms of weight and money and communicating solutions to practical problems.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Four rules of number. ● Decimal numbers, including use in everyday contexts. ● Ratio and proportion. ● Measurement – weight
PRISON ORDER	<p>L1: Solve problems requiring calculation with common measures, including money, time, length, weight, capacity and temperature.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Weight ● Calculating time. ● Worded problems including addition, subtraction, multiplication and division.
WORK RATE	<p>L1: Solve problems requiring calculation with common measures, including money, time, length, weight, capacity and temperature.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Calculating time – seconds, minutes and hours.

Resource name	Notes
LAUNDRY CHEMICALS	<p>L1: Solve problems requiring multi-staged calculations with common measures, including money, time, length, weight, capacity and temperature.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Money ● Weight ● Capacity ● Time
COMPLETED LAUNDRY	<p>E3: Use addition to solve every day problems.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Addition – worded problems
CHEMICAL DELIVERY	<p>E3: Solve problems requiring calculation with common measures, including money, time, length, weight, capacity and temperature.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Capacity ● Worded problems involving addition
WELDING	<p>L1/L2: Finding the area and perimeter of a shape, including area and circumference of a circle.</p> <p>Related topics:</p> <ul style="list-style-type: none"> ● Area and circumference of a circle ● Measuring length, mm, m and cm



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