Planning Inclusive Lessons

Influenced by teaching methods seen across the world, maths planning has adopted a mastery approach, with the lesson objective planned to ensure all learners are able to engage in the learning, no matter their prior attainment levels. The overall objective of mastery is to ensure each learner is confident with a concept, before moving on to the next. Where previously maths lessons may have been differentiated across learning objectives and tasks, with the mastery approach, most learners will be working towards a common outcome, with teaching and learning tailored and scaffolded to meet individual needs. Some learners may require a more personalised approach, including specific learning outcomes and provision to develop foundational skills.

Where possible, the whole class should be working on the same material and tasks should not be differentiated, but instead increase in difficulty and depth. Learners will have increased self-esteem as they work on the same tasks as their peers, as well as a more secure understanding of a concept. The aim of the lesson becomes about all learners meeting the selected objectives, and opportunities for deepening the learning presented as and when learners are ready. This involves applying the taught knowledge in different contexts and developing a long-term understanding which can be adapted to answer a variety of problems.

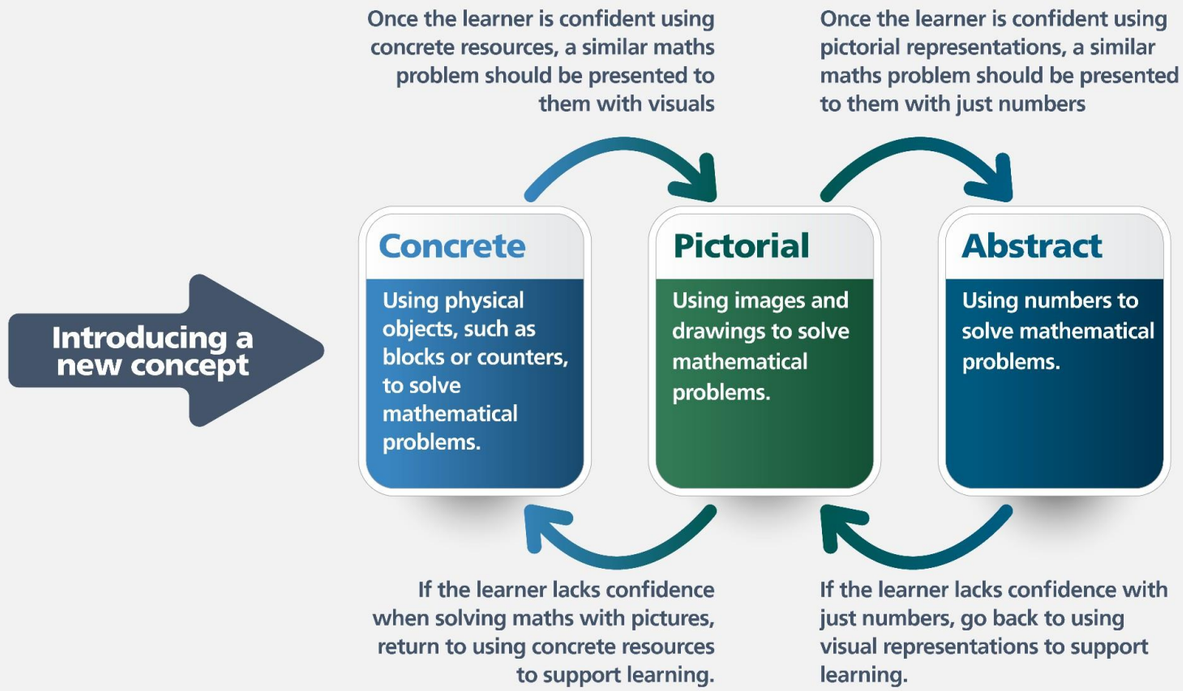
Instead of differentiating through task, those who require extra support should have additional input prior to the lesson, be part of more focused group work to go through an activity, and/or additional opportunities to practice. When planning lessons, it is important to consider a learner's prior attainment within the area of maths, as some learners will have strengths and learning gaps within the subject and should receive more focused support only when needed. In addition, it is beneficial to provide resources or visuals which could support these learners in meeting the same objectives as their peers.

Mastery includes the use of resources and representations to help learners see the structure of the maths; learners with SEND may require the support of these resources for a slightly longer period but should be scaffolded to develop independence in engaging with the mathematics without the resource.

Planning should be reactive to the needs of the class, and although it is beneficial to have an aim for the end of the week or unit, learners' progress should be reflected upon daily and the subsequent lesson should be adjusted to ensure the specific needs of the learners are being met. This in turn leads to more of the class being 'secure' with a concept, before teaching moves on.

Concrete, Pictorial, Abstract (CPA)

This method of teaching and learning uses objects and pictures to ensure a learner has understood an abstract mathematical concept. As maths is intangible, it is beneficial to introduce a concept with the use of concrete resources, e.g., blocks or counters. This helps to apply an abstract idea to practical resources, encouraging the learner to make connections between the two. Once confident with the concrete resources, the learner can then move to using pictures and diagrams to support their learning, before finally being encouraged to try the same maths questions without the scaffold. As the learner moves from concrete to pictorial to abstract, it is important they are given the opportunity to compare representations from each stage, to aid them in making connections and develop a secure understanding. Although some learners may not feel they need concrete resources or visual prompts, all learners should be encouraged to go through this process as a bridge to working in the abstract, to help them make connections and deepen their mathematical understanding.



Creating an Inclusive Environment

Maths lessons should not be silent. It is important learners feel able to work independently, but they should also work well alongside their peers. The best maths learning happens when learners can talk through their ideas with a teacher or a partner, and therefore it is good to encourage this productive discussion during lessons. When planning opportunities for talk, ensure that all learners have the support they need to access these discussions, which could include scaffolding such as sentence frames, visual support and/or peer partners.

It is also important all learners have had the opportunity to use concrete resources, such as bead strings or counters, to support their learning. Often this works best if a concept is introduced with concrete resources readily available for the entire class to use. Once learners have been shown how to use the equipment to support their learning, they can decide whether they wish to use it or not. Learners may need the support of the teacher in making this decision – some may cling to the resource for security, whilst others may feel embarrassed to use the resource if other learners are not.

As maths is a subject where often there is an 'objective' right or wrong answer, learners can lack resilience or confidence in their own ability if they feel as though they are consistently getting things wrong. Learners can also lack resilience and confidence due to having large gaps in their learning. It is important to ensure learners are given equal opportunities to learn core knowledge, so that they are less likely to make mistakes. Learners can also benefit from a culture where mistakes are embraced and viewed as a part of the learning process.

Linked to this, it is useful to point out, carefully, what a 'wrong answer' to a question could be, as this helps learners with lower confidence to demonstrate their understanding and develop their reasoning.

Curriculum Considerations

Key Stage 1

- Learners should have 1 to 1 correspondence when counting.
- Learners should develop automaticity in addition and subtraction facts to and within 10.
- Ensure learners have a concept of 'more than' and 'less than' and can describe the relative sizing of number.
- Encourage learners to represent numbers in many different ways, in pictures, as a calculation, in words.
- Ensure learners can explain the place value of 10s and 1s.
- Use resources such as tens frames, Numicon and base 10 blocks confidently, to support learning where needed.

Key Stage 2

- Ensure learners are secure with all times tables (by end of Year 4), as this acts as a foundation for other maths concepts.
- Learners should have secure understanding of place value, up to 10,000 and beyond.
- Learners should begin to apply their knowledge of number and written methods to reasoning problems.

The Main Principles of Mastery

The core principle behind mastery is that learners should develop a secure and long-term knowledge of mathematical concepts through carefully planned lessons, which gradually and strategically build on prior learning. This teaching style should be constantly revisiting and building on prior learning, helping to make connections and develop depth of understanding.

NCETM have broken down the key principles of mastery into five strands: Coherence, Representation and Structure, Mathematical Thinking, Fluency and Variation. These are useful to consider when planning a unit, to ensure all elements of mastery are covered.

Strategies to Scaffold Learning

How can I support learners who struggle to retain vocabulary?

- Be conscious of the range of vocabulary learners are exposed to. There are often several different words for one mathematical concept (e.g., add, sum, total, plus). Learners will need these words to be defined each time a new one is introduced and may need questions to be rephrased to understand their meaning. Learning should be documented in the classroom and referred to within and across lessons, for example on a working wall.
- Before a concept is introduced to the whole class, take time to familiarise chosen learners with new vocabulary and its meaning. This will give those learners greater confidence, as they feel confident when this same idea is introduced to the whole class.
- Use of visuals and actions can help to remind learners of the meaning of a word, or how it links to a mathematical symbol.

How can I support learners who struggle to access lessons because of literacy difficulties?

- If solving word problems, consider deploying an adult or pairing a learner with a confident peer to read the questions aloud to relieve the pressure of decoding the language.
- Some learners may benefit from 'drawing' the word problem, so that after a question is read, the learner has an image to refer to. This can enable a learner to 'see' the information they are missing, and decide what they need to work out, so that they can solve the word problem.
- Use of concrete resources and visuals is extremely important in helping learners to access questions.
- Ensure worksheets are laid out clearly and learners are not overwhelmed with a page of questions. Some learners may require different resources, which could include plain paper or enlarged square paper, to access set work.

How can I support learners who need additional time to develop conceptual understanding?

- Use intervention time to play games that consolidate a new or tricky concept with an adult.
- Use pre-teaching to give some learners a head-start.
- Have clearly laid out worked examples for these learners to refer to when working independently.
- Ensure tasks are scaffolded so that the learner can focus on the planned objective, for example prewrite information which is non-essential to the learning (date, learning intention), so the learner can focus directly on the skill being taught.
- Use representations learners are familiar with to transfer and connect similar ideas. For example, in Year 1, they use a tens frame that shows ten ones is equal to one 10, and then in Years 4 and 5 a tens frame could be used to show ten tenths is equal to 1.