Mastery teaching: a model for lesson planning in Maths

How should you approach planning for mastery in Maths? Julia Stead outlines the planning and assessment cycle you should implement.

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The mastery approach to teaching is a hot topic at the moment across all age ranges in education.

It bills itself as a teaching method which allows all pupils to excel, and aims to give all pupils a thorough brick by brick solid wall of knowledge, which they can then apply to solve the huge range of connected mathematical problems they encounter at each stage of their learning.

How teachers plan for this style of Maths curriculum poses questions. It can mean changing pedagogical style and rethinking planning format and schemes of work. It will open up conversation and debate about how to start.

The fundamentals

It’s worth understanding the main points, aims and rationale of a mastery curriculum. What are the non-negotiables?

- Pupils are required to totally understand and master a topic before proceeding onto the next topic area. The decision to progress onto new learning content is based purely on security of knowledge and readiness. If certain children understand a topic before others, they are challenged through depth of knowledge – differentiation is by rich, varied and sophisticated problems for higher achievers and immediate intervention and support for lower achievers.

- Teachers must believe that all children are capable of achieving the desired level of knowledge. Expectations must be high.
• The curriculum has to be exceptionally detailed and structured. The pupils’ learning pathway is crafted with carefully sequenced stepping-stones through content.

• We need to teach children complete structural knowledge of Maths, especially number. This way, they can make connections in all areas of Maths. Their sound knowledge allows them to recall facts from their long-term memory and manipulate them to work out other mathematical facts. Rapid recall of mathematical facts is key.

• Technical proficiency in all areas of Maths, and conceptual understanding are developed in parallel, due to children undertaking ‘intelligent practice’ – varied practice that delves deep into the precise area of Maths being taught. As teachers, we need to develop engaging and varied tasks to practise the Maths being taught. This is where planning in teams can help – two (or ten!) heads are better than one.

• Assessment is a key and constant part of the mastery cycle. Precise questioning is used – constant assessment for learning (AfL). This identifies gaps in children’s knowledge, and teachers or support staff can intervene. This immediate formative assessment leads to same day addressing of misconceptions for individuals or groups who have not understood the key teaching.

• Resources include high quality textbooks and both concrete and pictorial representations of mathematical ideas and concepts, to go alongside formal and very precise teaching. This would create a large amount of work for teachers initially, but would be there for subsequent years.
Planning, teaching and assessment cycle

1. Teaching teams design and define what will be taught in each year group.

2. Whole class teaching gives children the initial information and learning content.

3. First formative assessment carried out.

4. Misconceptions are addressed through targeted intervention, support and practice. Intelligent practice of more complex, multi-link problems for those who have mastered the concept.

5. Re-testing.

6. Continued immediate support for those who need it. Intelligent practice of more complex, multi-link problems for those who have mastered the concept.

7. Summative testing. Move on to next topic.

What does this mean for teaching and planning?

Firstly, for non-specialist Maths teachers, the new mastery style can be quite daunting. Seek support from your Maths coordinators, specialists or HODs if content accuracy is troubling you. Security of knowledge is paramount if we are to teach children to be masters of these facts.

In order to teach mastery, you need a solid network of staff on board to make the assessment and teaching cycle manageable. Consider how you will have time/support staff/physical room and resources to address misconceptions with all pupils who need support in a near-immediate fashion. This is particularly difficult when there are so many demands on teachers’ time, and timetables are crammed already. Though difficult logistically, this is a fundamental principle of the mastery approach working.

There needs to be a shift in thinking to a more prescriptive way of teaching. The curriculum learning pathway relies on precise and prescribed steps. The teaching cycle is full of assessment and reaction. This can be at odds with creative practice, and taking the curriculum in the direction that the children
want to go. However, creativity can still flourish – in the resources you use and the way you present the material.

Planning needs to involve crafting new schemes of work, definitely planning as part of a team. Everyone needs to know where the path has just come from, and where it is heading.

If you know where exactly on the path your sequence of lessons sits, you know precisely what you are covering in this snapshot of their learning. The areas to be taught in each year group and each term need to be agreed and clarified. This could mean sitting with a photocopy of the Maths curriculum and physically cutting the objectives up, dividing them out between year groups, key stages and terms.

Units of work will evolve from this process, and you will begin to see the clear pathway for the teaching of the precise areas of Maths. Planning will involve trying things out – understand that in such a huge change of teaching and learning style, it is ok to experiment and tweak as you become aware of flaws or things not working out exactly to your setting’s liking. Listen to others’ views so that your curriculum and mastery approach can change and adapt with experience.

As a result of the Shanghai – England teacher exchange, the NCETM (National Centre for Excellence in the Teaching of Mathematics) created their ‘Planning for Mastery’ documents, which gives excellent guidance on questioning, and tasks that can develop mastery in the areas of Maths dictated by the National Curriculum content.

**Handling underachievement**

In time, the mastery approach is designed to eliminate underachievement, as gaps are plugged immediately and everyone progresses through the material at the same pace. By taking longer over the early concepts, pupils are taught fundamental knowledge first, and it is the first to be retained – allowing them to build, however slowly, on that fundamental early knowledge.

There is no need for traditional ‘closing the gap’ Maths interventions, as misconceptions are addressed immediately. This would be through supported ‘intelligent practice’, smaller group teaching of the day’s mathematical content, one to one teaching, or detailed explanatory support.

Constant rigorous quantitative assessment, along with formative AfL, stops any children from falling through the net unnoticed. Teachers can therefore have a pinpoint-sharp knowledge of where each child is at, at any given moment.
Conclusion

Adopting a mastery approach involves big changes in terms of how you plan, teach, staff and resource mathematics in your school or year group, but there is a clear reason for doing so. The main aim for the mastery approach is that children form such secure knowledge in the building blocks of Maths, that they can then use that solid firm grasp of the facts to make connections and solve other, more varied and conceptual problems. A worthy aim indeed.

I’ll leave you with Ofsted’s view. Jane Jones, Ofsted’s National Lead for Mathematics, said on her guest blog for the NCETM:

‘Ofsted does not have fixed expectations of what the curriculum in practice will look like, including how teachers differentiate […] The national curriculum makes it clear that the majority of pupils are expected to move through the programmes of study at broadly the same pace. In all key stages, pupils who grasp concepts rapidly should be challenged through rich and sophisticated problems before any acceleration through new content and those who are less secure should consolidate their understanding before moving on.’

Want more resources to support mastery planning? Check out our resource guide for mastery Maths in primary schools.