

Mastery Readiness - for school leaders considering or about to embark on mastery in school

Cathryn Hardy
Teaching for Mastery Lead
SHaW Maths Hub

Overview

1. Is there a need for change?
2. How well are we doing in consideration of the recommendations for improving mathematics?
3. Why a mastery approach?
4. Teaching for mastery in the classroom: what's the same? What's different?
5. Teaching for Mastery: opportunities through the Maths Hub

Is there a need for change?

Step 1: Decide what you want to achieve

Identify school priorities using data and your professional judgement



5-step School Improvement Cycle

Our School Improvement Cycle, supported by key EEF resources, can help you successfully apply evidence in your school's day-to-day work

Improving Mathematics in Key Stages 2 and 3

Eight recommendations to improve outcomes in maths for 7-14 year olds

Improving maths at KS2 & 3 recommendations

1. Use assessment to build on pupils' existing knowledge and understanding
2. Use manipulatives and representations
3. Teach strategies for solving problems
4. Enable pupils to develop a rich network of mathematical knowledge
5. Develop pupils' independence and motivation
6. Use tasks and resources to challenge and support pupils' mathematics
7. Use structured interventions to provide additional support
8. Support pupils to make a successful transition between primary and secondary school

RECOMMENDATION 3 Teach strategies for solving problems

IMPROVING MATHEMATICS IN KEY STAGES TWO AND THREE

A self-assessment guide

RECOMMENDATION 3

Teach strategies for solving problems



! INEFFECTIVE

There is a lack of genuine problem solving tasks in teaching. Tasks tend to be routine and can be completed using a procedure that pupils know well.

Teachers lack knowledge and understanding of problem solving strategies. They do not feature in their teaching.

Teachers do not consciously vary the structure and context to problems.

IMPROVING

Some teachers select non-routine problems, but other teachers do not. Teachers sometimes do not feel confident enough to work on genuine, non-routine problem solving.

Teachers effectively model a range of problem-solving strategies. However, they do not effectively support pupils to self-regulate their use of strategies.

Teachers do pay attention to context and structure when setting problems, but this is not systematic and does not support improved understanding.

✓ EXEMPLARY

Most teachers confidently select genuine, non-routine problem-solving tasks.

Teachers know a range of strategies, which they can model effectively for pupils. They teach pupils to carefully and consciously choose the most appropriate strategy for the problem at hand.

Teaching is organised so that problems with similar structures and different contexts are presented together, and, likewise, that problems with the same context but different structures are presented together. Pupils are taught to identify similar mathematics that underlies different situations, and identify and interrogate multiple relationships between variables in one situation.

RECOMMENDATION 3 Teach strategies for solving problems

Improving

- Some teachers select **non-routine problems**, but other teachers do not. Teachers sometimes do not feel confident enough to work on genuine, non-routine problem solving. **Teachers effectively model a range of problem solving strategies.** However, they do not effectively support pupils to self-regulate their use of strategies.
- Teachers do pay attention to context and structure when setting problems, but this is not **systematic** and does not support improved **understanding**.

RECOMMENDATION 3 Teach strategies for solving problems

- Some teachers encourage pupils to use representations and manipulatives to represent problems mathematically. However, this practice is not consistently adopted by teachers throughout the school.
- Teachers deploy worked examples, but they are mainly used to consider steps in a procedure and are rarely used to examine problem-solving strategies.
- Teachers are confident using only some of these approaches, or they could improve in some areas.

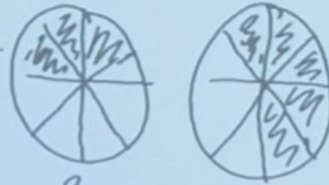
Teach strategies for solving problems ... a 'Teaching for Mastery' approach

What's the same? What's different?

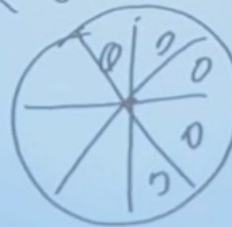


Methods

$$\frac{3}{8} \quad \frac{5}{8}$$



$$\frac{3}{8} < \frac{5}{8}$$



⑤
4
③ 3
2 2
1 1



Developing/reviewing a vision

Why are we embarking on this change?

What difference will this change make to:

- teaching/outcomes for learners? Why?
- the attitudes of learners? Why?
- the aspirations of learners? Why?
- the relationship with parents? Why?
- the place of the school in the community? Why?

How have others approached establishing a new vision for maths in their schools?

<https://apps.nationalcollege.org.uk>

Why a mastery approach?



[The Big Picture](#)
[Evidence summaries](#)
[Practical Tools](#)
[Projects and Evaluation](#)
[Scaling up evidence](#)
[News](#)
[More ▾](#)
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Teaching and Learning Toolkit

An accessible summary of the international evidence on teaching 5-16 year-olds



Filter Toolkit

Toolkit Strand ▾

Cost ▾

Evidence Strength ▾

Impact (months) ▾

Filter results by keywords



Cost



Evidence



Months Impact

Reset ↻



Download Toolkit

Feedback

High impact for very low cost, based on moderate evidence.



+8

Metacognition and self-regulation

High impact for very low cost, based on extensive evidence.



+7

Reading comprehension strategies

High impact for very low cost, based on extensive evidence.



+6

Homework (Secondary)

Moderate impact for very low cost, based on limited evidence.



+5

Mastery learning

Moderate impact for very low cost, based on moderate evidence.



+5

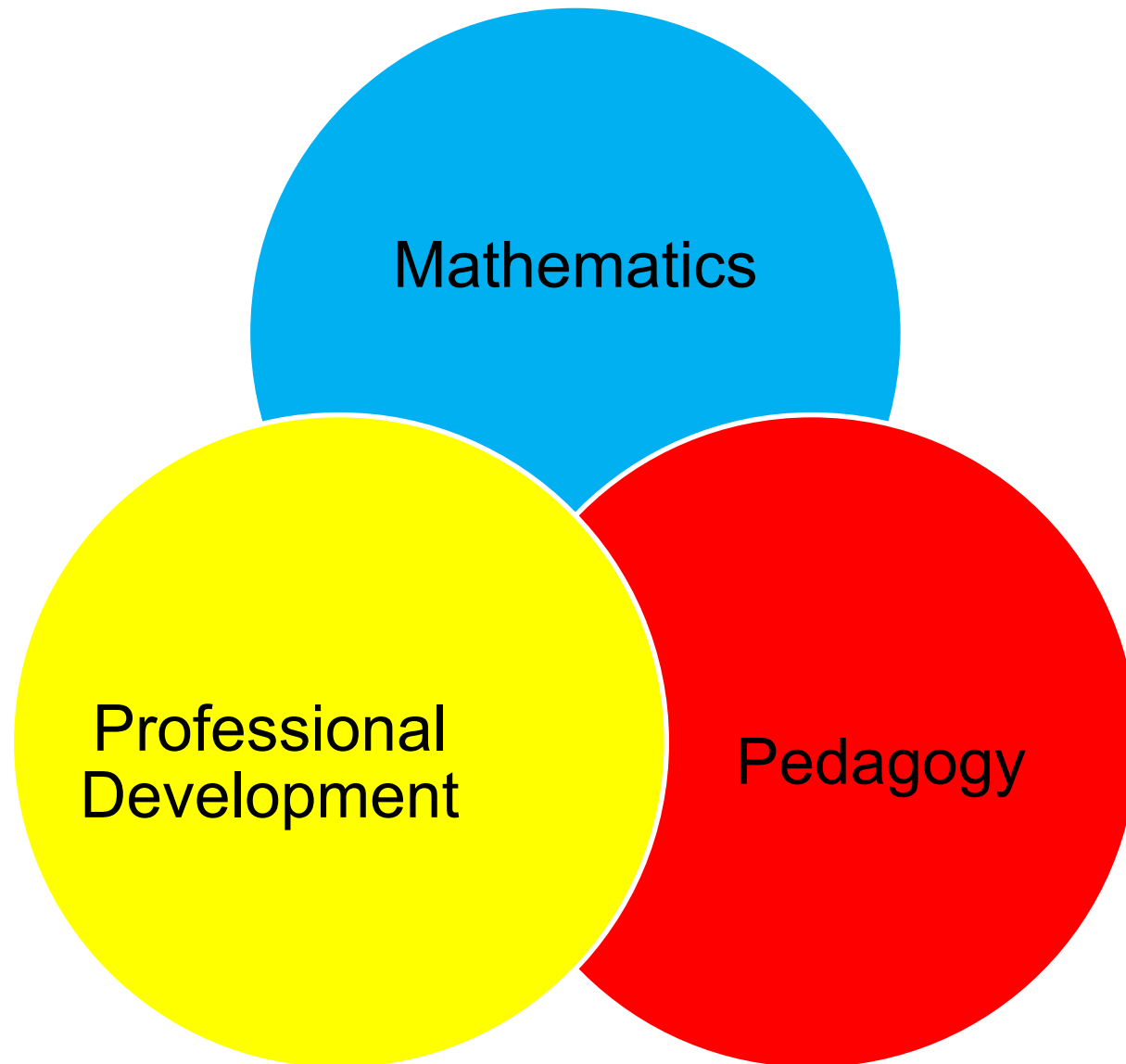
Mastery approaches to mathematics and the national curriculum

‘Mastery’ in high performing countries

“The content and principles underpinning the 2014 mathematics curriculum reflect those found in high performing education systems internationally, particularly those of east and south-east Asian countries such as Singapore, Japan, South Korea and China. The OECD suggests that by age 15 students from these countries are on average up to three years ahead in maths compared to 15 year olds in England. *What underpins this success is the far higher proportion of pupils reaching a high standard and the relatively small gaps in attainment between pupils in comparison to England.*”

NCETM, October 2014

Teaching for Mastery: what is it?



Opportunities for schools

A diagram consisting of four overlapping teal shapes. Three circles are arranged in a horizontal row, and a large oval is positioned below them, overlapping the bottom of each circle. Each shape contains black text.

Mastery
Readiness

Teaching for
Mastery
Development

Teaching for
Mastery
Embedding

Complementary work groups: lesson
design, mixed age, SKMT

School Leaders: Teaching for Mastery Readiness



- Has a 'mastery approach' been discussed with teachers, TAs, governors, parents?
- Does everyone believe that it is possible for every child to succeed and that ability is not fixed?

- Representations and Structures
- Misconceptions
- Mathematical Thinking/reasoning
- Age Related expectations
- Collaborative Planning

Mathematical mindset

Subject Expertise

Vision and Shared Culture

Promoting and creating a shared vision for why mathematics is important, why you want to embrace a mastery approach, what you want for your pupils and what you all want to achieve through the mathematics curriculum.

Systems

Arithmetical Proficiency

Will current systems limit 'teaching for mastery'?

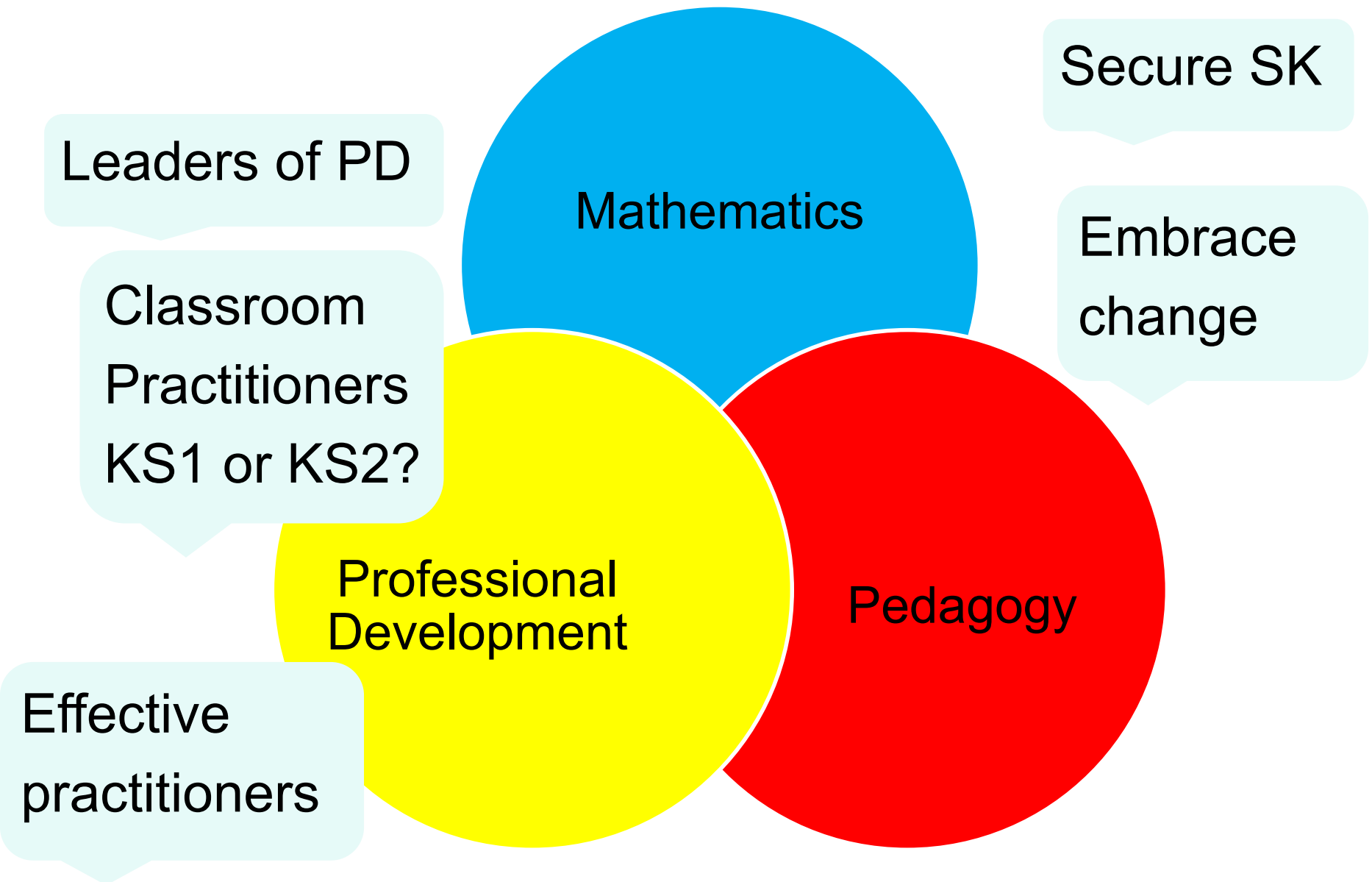
Children supported & challenged in mixed ability groups – no differentiation

Opportunities for daily, same day, teacher-led interventions

Assessment and Tracking

- Accuracy
- Efficiency
- Flexibility
- Practice to be skilled
- Key number facts
- Calculate not count

Teaching for Mastery: what is it?



Opportunities for schools

Central

NCP 19-11 Mastery Readiness : **Fully booked**

North Mids

NCP 19-11 Mastery Readiness — **Running – all NM areas - details to follow on website soon**

SHaW

NCP 19-11 Mastery Readiness

Will be based in Wolverhampton. Begin after half term
Schools can express interest through Website (as well as for TfM WGs 2020-21)

Is your school 'mastery ready'?
Resources to support you

Personal Learning Space

CathrynHardy
(SHaW Maths Hub)



My Details



My Communities



My Files & Folders



My Favourites & Notes



My Self-evaluation



My Online CPD



My Learning Journal



My Career Portfolio



My Work Group



Sharing & Contacts



My Posted Items



My PLS Timeline



Log Out

My Maths Hub work

Mastery

Created on 14 May 2015 by [ncetm_administrator](#)

Updated on 04 July 2019 by [ncetm_administrator](#)

Mastery

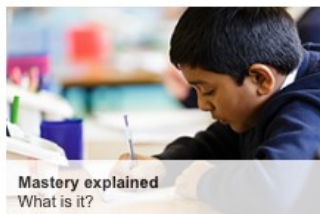
We have made some improvements to our mastery pages. Materials are now even easier to find, and you can also read more about mastery, watch videos, and sign up for CPD opportunities. If you need any help with navigating this section, or can't find what you are looking for, [get in touch](#).

Children's chances of success are maximised if they develop deep and lasting understanding of mathematical procedures and concepts. Our teaching for mastery section explains the rationale for this approach. We also have case studies from schools, and interviews with teachers and heads involved in mastery projects.

Why not explore our resources supporting teaching for mastery? These include materials to help you plan lessons and assess pupils' understanding. Opportunities for you and your colleagues to collaborate with others on teaching for mastery are also always available through your local Maths Hub.

Quicklinks

- ▶ [Mastery](#)
- ▶ [Mastery explained](#)
- ▶ [Mastery materials](#)
- ▶ [Mastery magnified](#)
- ▶ [Mastery readiness](#)
- ▶ [Mastery opportunities](#)



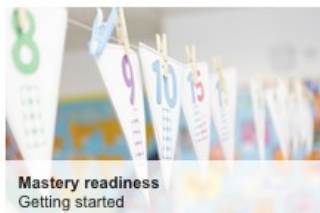
Mastery explained
What is it?



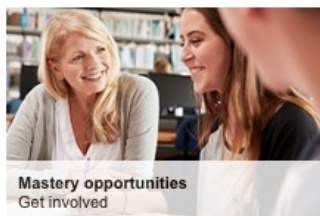
Mastery materials
Supporting resources



Mastery magnified
Case studies and videos



Mastery readiness
Getting started



Mastery opportunities
Get involved



SHaW Maths Hub

Led by the Salop Teaching Alliance, with The Priory School, Shrewsbury as the lead school.
The geographical area we aim to cover is Shropshire, Telford, Herefordshire and Wolverhampton



Work groups

Find out more about our work groups and book your place.



Receive regular updates

Register to receive fortnightly updates and communication about funded opportunities.



Latest updates

Read the latest primary and secondary updates.

<http://shawmathshub.co.uk>

Introduction



Twitter



Comments from schools:

'All staff have benefited enormously from the CPD, it is good to see that this support will be available for another year.'

confidence and ability to lead across the school. The video groups and observing the lessons were of great use to take back to school.'

It was great to have colleagues in class to talk through the journey of the lesson and to share ideas and numbers which gave us confidence in teaching and solving problems.

Previous G has given us the tools to use and

Applying the EIF to the teaching of mathematics

- Inspectors will consider what steps the school has taken to ensure that:
pupils **understand and remember the mathematical knowledge, concepts and procedures** appropriate for their starting points, including knowledge of efficient algorithms. This should also ensure that pupils are ready for the next stage, whether that is the next lesson, unit of work, year or key stage, including post-16 mathematics
- the **school's curriculum planning for mathematics carefully sequences knowledge, concepts and procedures** to build mathematical knowledge and skills systematically and, over time, the curriculum draws connections across different ways of looking at mathematical ideas
- the curriculum **divides new material into manageable steps lesson by lesson**
- the school's curriculum identifies opportunities when **mathematical reasoning and solving problems** will allow pupils to make useful connections between identified mathematical ideas or to anticipate practical problems they are likely to encounter in adult life. Pupils have sufficient **understanding of, and unconscious competence in, prerequisite mathematical knowledge, concepts and procedures that are necessary to succeed** in the specific tasks set

Applying the EIF to the teaching of mathematics

Inspectors will consider what steps the school has taken to ensure that:

- within the curriculum, there are **sufficient opportunities planned to revisit previously learned knowledge, concepts and procedures**; this is to ensure that, once learned, **mathematical knowledge becomes deeply embedded in pupils' memories**. This then allows rapid and accurate recall and frees pupils' attention so they can work with increasing independence, apply their mathematical knowledge to more complex concepts and procedures, and gain enjoyment through a growing self-confidence in their ability
- there is flexibility in curriculum planning so that the school can **address identified gaps in pupils' mathematical knowledge** that hinder their capacity to learn and apply new content. Those pupils behind age-related expectations are provided with the opportunities to learn the mathematical knowledge and skills necessary to catch up with their peers
- there are **objective assessments** that can identify when all pupils have gained the intended understanding and unconscious competence in knowledge, concepts and procedures necessary before they move on to new or more complex content

Applying the EIF to the teaching of mathematics

Inspectors will consider what steps the school has taken to ensure that:

teaching models new procedures and uses resources and approaches that enable pupils to understand the mathematics they are learning

all teachers of mathematics, including non-specialist teachers of mathematics, have sufficient mathematical and teaching content knowledge to deliver topics effectively

pupils' mathematical knowledge is developed and used, where appropriate, across the curriculum.

- Paragraph 295, school inspection handbook, Ofsted, 2019