

Teaching for Mastery Lesson Design at All Saints' CE Junior School A Primary Case Study



East Midlands West Teaching for Mastery Lesson Design Work Group

One of the biggest challenges facing schools as they adopt a teaching for mastery approach is how to design lessons. Working collaboratively with practitioners from across the East Midlands the project, we began by identifying the key features of mastery, before exploring a route through a lesson, that allowed teachers to link these together in a coherent manner. Essentially we were looking at how to turn theory into outstanding classroom practice. Though our research often went much wider what is captured here in these case studies, each participant school was asked to focus in on one aspect of lesson design, how it has been incorporated into classroom practice, and the impact it has had on learners.

Overview

James Allen is a Year 5 teacher and Numeracy leader in Year 5 and 6 at All Saints' CE Juniors, Matlock. James took part in the East Midlands West MathsHub Teaching for Mastery Lesson Design Work Group in 2017/18. The work group has allowed James to reflect on the effective use of a variety of representations in his setting. Working with his class and intervention groups has highlighted the need for focused representations of problems whilst retaining variation to aid learners' conceptual understanding.

What we did at All Saints'

Context

With the school's mastery approach to teaching mathematics is in it's second year, James went back to All Saints' with several areas of development. Following discussions with both children and staff, James defined the area most likely to have the greatest impact on pupil learning as representations. Children reported that they often felt like the teacher's abstract solution to a problem was "magic". Staff understanding of representations was based on the training delivered on the bar method, and that itself was not a preferred practice for most; many said they didn't follow its use for solving problems. Two staff development meetings had also taken place on Concrete-Pictorial-Abstract approaches.

First steps

James thought it important that every child in every classroom have access to a range of resources and manipulatives to aid their learning in every lesson. He believed that this would mean children could solve problems and practice fluency using their preferred method supported by place value charts, 0-9 cards, multilink, counters, place value counters, dienes apparatus, numberlines, 100 squares, Cuisenaire rods, etc. He made these available in his own classroom as well as inventorying the school's maths resources and sharing a list of 'must haves' with the staff. On reflection, he recognised this as a 'shotgun' approach. The children needed the use of the resources modelling to them and having so much to 'play with' in a numeracy lesson became a novelty; distraction from the learning as opposed to enhancing the learning. Staff needed to consistently use the appropriate resources to show and reinforce conceptual understanding.



Focused models and representations

James recognised that not all resources intended to support learning in numeracy are useful all the time. Clearly a blank 100 square will not support a child learning how to measure angles; in fact, it may be detrimental to that child's learning. Looking at the big picture of the issue of models and representations and it becomes apparent that there are a multitude of possibilities for each numeracy topic. When delivering lessons on fractions, James had to ensure that the representations he was using in front of the children, which were the ones he expected the children to use to solve the problems, *exposed* the mathematical concept behind the problems as opposed to *confusing* it. James realised that there are times when teaching fractions using the 'pizza' representation (circles divided equally) works well, such as converting between mixed and improper numbers, and times when it confuses or distracts from the learning. It is easier to compare fractions when bars of equal length are set above and below each other rather than a child using their cognitive powers to split a circle into equal parts and deciding which has the larger slices.

Choosing the correct representations for the children to use and modelling how to use them empowers the children to spend their time learning the concepts of mathematics as opposed to the processes. James had realised that the more the children were given the correct representations to work with for each topic/objective throughout their learning, the more understanding of the subject they may gain over time. Ideally, if a child could recognise themselves which resources and representations would aid their understanding then the teaching and learning of numeracy would be at its most powerful.



Impact on learning

The idea that there was the correct model for each objective transformed James's approach to planning numeracy. It helped him to pinpoint and prepare concise learning opportunities for pupils in his class though CPA. Instead of encouraging to children choose their own preferred method of solving a problem James planned to solve a problem using one ideal model for all pupils, usually a concrete solution. In time, the pupil's confidence increased and thus their resilience to new learning experiences in the subject. As opposed to pupils learning many methods and choosing one they were learning one and making connections themselves to other ways of finding a solution. Children were engaging with physical resources and drawing their own representations to show their understanding.

Summary and next steps

Disseminating throughout the federation

James's next task is to share his findings with his federation of schools, which includes All Saints' Infants, and see that teachers are using the correct representations from EYFS to Year 6. The idea behind this is that if the pupils at All Saints' see the correct representations and their modelling year-in-year-out they stand a better chance of leaving All Saints' as strong mathematicians.

There are several steps to enable this for every pupil. Firstly, the appropriate resources must be available to every pupil in every class. Topic-specific resources must be accessible to pupils in the classroom every numeracy lesson. Evidently, EYFS will not need decimal place value counters but the children in Year 6 will need 100 squares as Year 1 does. Arguably, the older the children get the more resources they need, which can be contradictory to some teachers' approaches. A whole-school approach to the resources on offer to the pupils must be decided, and these resources must maintain a continuity between year groups; the same place value charts in every class will ensure the no pupil is confused by O or U (for Ones or Units column) or where the decimal point should be (on the line or in its own column).

Time will need to be allocated for staff to support their own understanding of representations, and to decide which representations they will be using when modelling for each objective in their curriculum. Teachers and teaching assistants alike must be aware of how the model they show the children can enhance or hinder their learning.

More Information

For more information about this project, or other workgroups and opportunities available through the East Midlands West Maths Hub:

Visit our website: <http://www.emwest.co.uk>

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