Teaching for Mastery Lesson Design at St Patrick's Catholic Primary School

A Primary Case Study

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

Lisa Heggs is Maths Lead and the Year 6 teacher at St Patrick's Catholic Primary School in Leicester. Lisa took part in the Teaching for Mastery Lesson Design Work Group in 2018. Like many schools, St Patrick's was keen to adopt a mastery approach towards planning and teaching in order to deepen children's mathematical understanding, create greater resilience and develop a reasoning and problem-solving approach. Lisa explained:

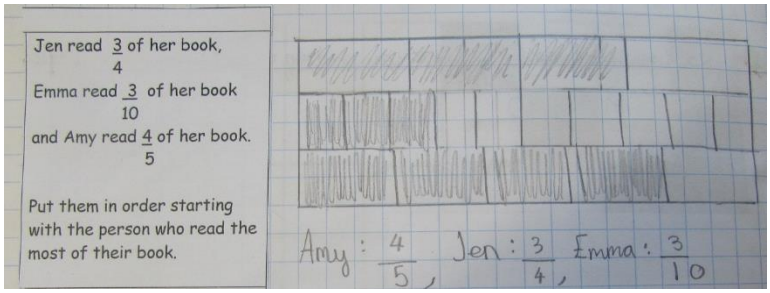
"Moving children – and indeed teachers - away from seeing the correct answer as ultimately the end result was proving a challenge. Having the time out of the classroom to discuss mastery with other maths coordinators was hugely beneficial. We were able to focus on the various elements and what leads to maths mastery and how we can plan and deliver lessons to ensure we are creating opportunities for our pupils to demonstrate how they can solve problems, the reasoning behind their answers and what they do – or don't – understand."

What we did at St Patrick's

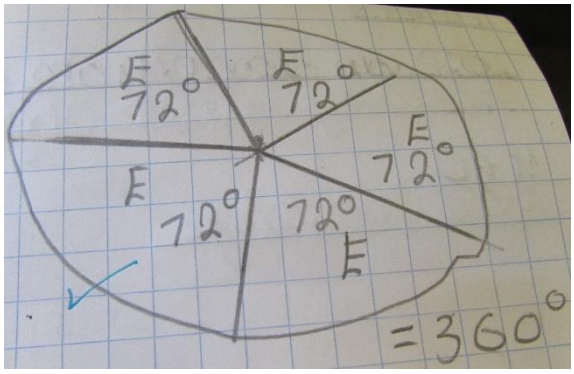
By the time children have reached Year 6, they often have a good grasp of basic maths – or at least they appear to. When questioned, it soon became apparent that our 'expected at' and even 'greater depth' children could find answers, but could not always explain why it was the answer, how they knew, whether or not there was a different way of solving a problem or how to prove they were correct. Our 'working towards' children struggled to find a starting point and would not even attempt some problems. We needed to be able to 'see' what route they were taking and their understanding of what was being asked. Encouraging our children to use pictorials gave them a way in; it was a way of allowing us to assess what they knew and it also provided opportunities for those more-able pupils to evidence a deeper understanding.

Pictorials

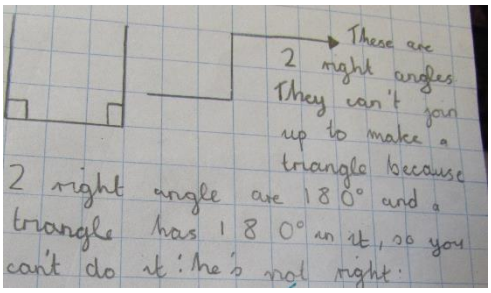
Initially children found using pictorials difficult. They were used to relying on numbers, formal operations and mathematical methods. Those pupils who were able to arrive at a correct answer didn't 'see the point' in having to show how they got there; those children who didn't, at first, understand the question, didn't see how it was going to help. Overcoming this reluctance, took only a few weeks and daily perseverance on the teacher's part. One pictorial was always ready prepared, with at least one more in mind to introduce to the children during discussion. Soon, they began to see the benefits and were then offering their own ideas and suggestions.



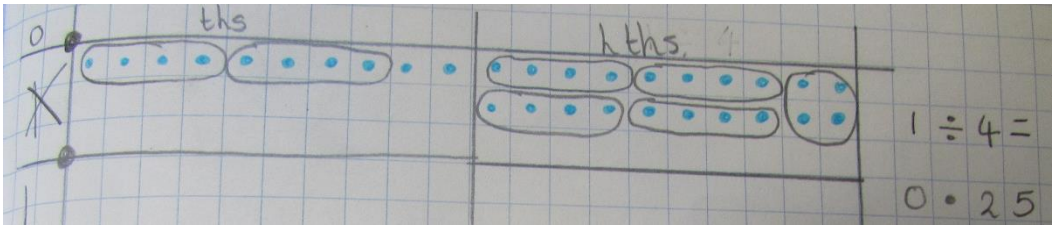
This question required the pupil to be able to compare fractions. Initially, by using a bar model, the child could 'see' which was larger. Although not accurately drawn, it helped them to understand the size of the fractions before ordering them. They then went on to make them equivalent to prove their findings.



Pupils were asked: if five equal angles all meet around a point, what is the size of each angle? For children who could not immediately understand the question, a simple drawing following the wording (5 equal angles around a point) prompted many to be able to draw a relevant pictorial to support. Once they could see the 5 equal points meeting, for many children, to draw a circle was an obvious next step. They were then able to go back to the question and apply their knowledge of 360 degrees in a circle equally divided by 5.



Children were presented with the statement: My triangle has two 90 degree angles. Their task was to prove whether or not this statement could be true. Some pupils used their knowledge of shape to explain that since there are 180 degrees in a triangle and there needs be 3 angles this statement could not be true, but for others drawing a shape with two right angles allowed them to be able to see that it was not possible to create a triangle with these given angles.



Dividing one whole by 4 can be a fairly straight-forward process for some children. There are those who immediately know it will be a quarter and are then able to give their answer as either a fraction or a decimal. Not many children though were able to explain how we could divide the one whole by 4 until they were asked to show it in terms of tenths and hundredths. Once they could see the tenths, they were able to find how many groups of 4 could be made, what remained and how this too could then be put into equal groups.

Summary and next steps

Using pictorials in Year 6 has improved the children's ability to show reasoning and a deeper understanding of why an answer is correct. It puts abstract maths into a form that has led to children showing that they have understanding. It offers opportunities for proving how an answer has been reached and why it is or is not likely to be correct. Since our whole school approach is now mastery, hopefully children will move from one year group to another seeing pictorials as an important part of their maths lessons and teacher will be able to assess more clearly where understanding still needs to be developed and where there are gaps in 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
Follow us on Twitter: EM_MathsHub
Email: mathshub@george-spencer.notts.sch.uk