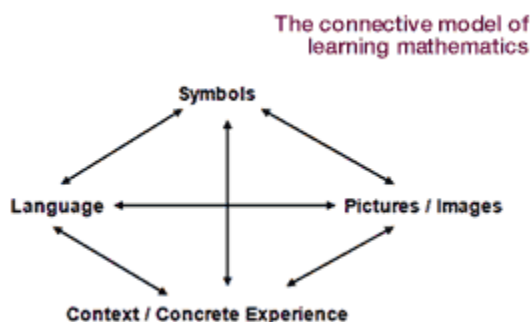


In which ways were you planning to strengthen links in Mathematics?

I planned to strengthen links in maths through developing the use of pictorial representations across the school. I decided to further embed the use of our learning journeys to display high quality maths linked to Haylock and Cockburn's connective model. I also wanted to train teachers in the use of conceptual variation to strengthen the links between areas through varied pictorial representations for each area of maths.



Why did you choose this area?

I chose this area because, after carrying out an audit in my school which involved pupil interviews, book scrutiny and discussions with teachers, I realised that whilst the use of vocabulary, symbols and apparatus was strong in my school; pictorial representations were not being used widely. I had researched the connective model and realised that by introducing more pictorial representations, this could close the gap for some of our children. Links were also not being made across units as any pictorial representations that were used were all similar and so didn't challenge the children's views. For example, when studying fractions, many classes were referring to images of fractions of circles or rectangles, but weren't using pictorial representations that supported understanding of fractions of lengths, number lines or amounts. There was also no use of fractions of irregular shapes. This was making it difficult for the children to make connections between fractions of shapes and fractions of other quantities.

What did your project involve?

At the start of the project, pupil voice interviews were carried out to find out about pupil views of maths. This is when it was discovered that while pupils could give vocabulary they had learnt in maths and could name apparatus, they did not appear to have many images in their books and couldn't explain how images were used to support their learning, or what they could use to help them if they were stuck.

To begin with, a staff meeting was held about conceptual variation. Staff were given the opportunity to work in teams using post it notes to make different links between areas of maths. They were then given a pack of pictorial representations and were shown how to develop their own.

The next step was to further embed the use of our maths learning journeys within maths lessons. Our learning journeys are divided up into the four areas from Haylock and Cockburn's connective model. As teachers introduce each area of maths, children add vocabulary, images, examples, apparatus and symbols to the board. This serves as a reminder for the children throughout the unit of work and, as it grows each day, reflects the progress that they have made. Staff were given support with developing this through mentor meetings with NQTs and by being given picture examples.

Lesson plans were redeveloped to include a section for pictorial representations. In year 2, images were used more frequently and children were taught to draw their own to support their learning. This included images of arrays as well as dienes.



What did you find out throughout carrying out your project?

Upon carrying out the initial pupil voice interviews, I discovered that previously children were not using pictorial representations to support their understanding. Some children were successful in their lessons, however when they were given a problem to solve that involved applying their learning, they were unable to because they had narrow ideas about different concepts. Some children had developed misconceptions about image-heavy areas such as fractions as they had only been presented with fractions of circles or rectangles and not of other shapes, objects or amounts. Through developing the use of pictorial representations in my own classroom, I quickly discovered which of my learners benefited from visual learning and engaged with the images. I also found that the pictorial representations supported EAL learners and those who had poor reading ability.

What differences did it make to your learners?

This is still an ongoing project which will need to be monitored over the coming months. However, in the short time that we have been using pictorial representations consistently within year 2, children have been more confident about solving word problems and applying their learning. Some children have begun to draw their own efficient pictorial representations to solve problems when there was no apparatus available for them to use (such as during their level 3 SATs paper). Some children were talking more about the images and what they showed, and could use images to 'prove' their answers. During pupil interviews, more pupils referred to the learning journeys as a method to help them when they were stuck.

What difference did it make to your school?

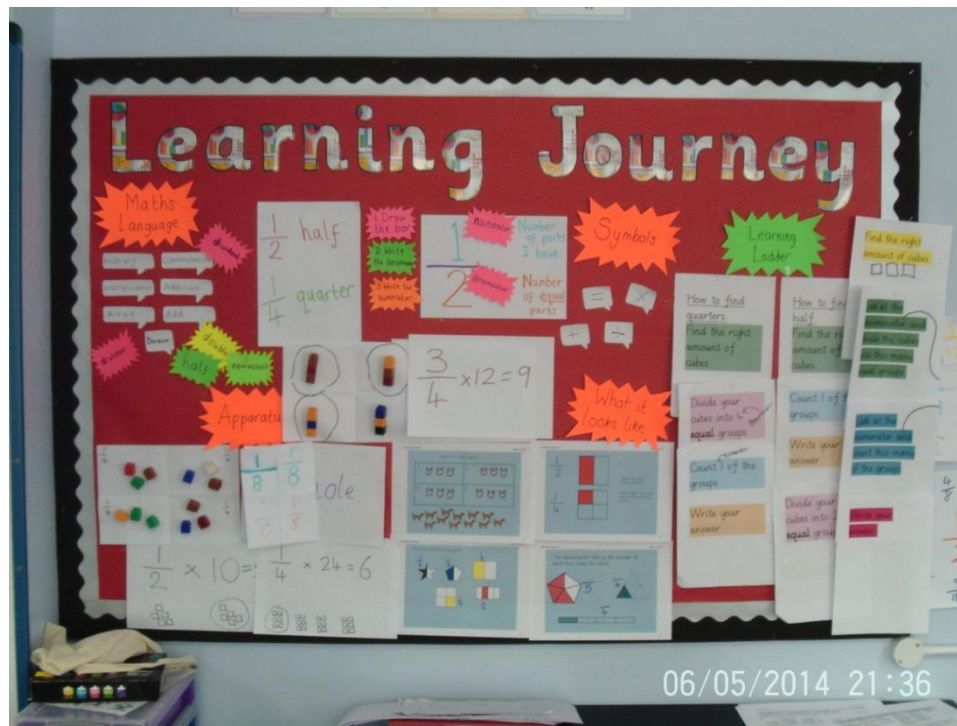
Since undertaking the projects, learning journeys have now become a part of everyday maths. Teachers say they are more confident in using them, and can see the value in using them. Our learning journeys are also now always up to date and looking good for when we have visitors as well as being useful to the children. By changing them in the lesson, it has also improved staff work life balance by ensuring that teachers are not developing their maths displays outside of lesson times. When observing maths lessons, several teachers have referred to the use of pictorial representations and conceptual variation in their lesson plans and have used them effectively within the lesson.

Next Steps

Our next steps as a school are to continue to embed the use of learning journeys including varied images. For September, I will be developing a bank of images for staff to refer to and use in order to save time. A staff maths handbook will also be developed with examples and images of learning journeys to support new staff members so that we are consistent as a school.

Steph Scott

Year 1Year 2

Year 2EYFS

[illegible]

Learning Journey

Units
5 6 7 8 9

Tens
30 40 50 60 70 80 90

Hundreds
300 400 500 600 700 800 900

Fractions
 $\frac{1}{2}$ $\frac{1}{4}$ $\frac{5}{1}$ $\frac{1}{2}$

Concrete

Symbols

Vocab

Numbers

01/01/2014 00:13

Year 6Year 6