

How scaffolds can effectively support children in their development of spoken reasoning in maths

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To discuss this case study, please contact us via email customersupport@camdenlearning.org.uk



Key Points

The skills of reasoning are key to creating successful mathematicians. Internalisation of these skills is the first step but the ability to voice your ideas is key to truly deep understanding.

Purpose

What were your reasons for doing this development work?

This has been an area for development over the past 2 years and I have been developing my understanding and a range of resources since becoming maths coordinator..

Through our participation in the Camden lesson study and our whole school focus on the development of maths teaching and learning, we identified a clear need.

We identified that, despite reasoning skills being effectively developed through teaching and learning, children lacked the language that helped them to articulate their reasoning in maths.

Reflections tended to rely on explanation of procedural information rather than skills such as generalising and proving.

Throughout the project, my focus expanded to include reasoning and justifying of strategies when calculating through the introduction of 'Number Talks'

Who were the identified target learners?

As I currently teach year 5, these were the target of my research however through my role as maths coordinator, I was able to introduce and develop strategies across the school through planning support and INSET.

What were your success criteria?

Samples of children's work were taken from their year 4 books for comparison with samples over the year.

Discussions with the many adults who work within the class were used to debate and discuss the progress made by the children.

The aim was that children would be able to effectively complete the scaffolds with

the support of the class discussions.

What did you do? (What success criteria did you use?)

Investigations were selected for their ability to support high quality generalising, justifying and proving.

These investigations were grouped in to themes so that children had the chance to revisit ideas and skills within their explanations.

Scaffolds were carefully planned and tested to ensure that they supported explanation rather than stunting children's ideas.

Oral rehearsal was used and insistence on the use of full sentences.

Emphasis and value were placed on the process of investigating over the finding of a correct solution. (this was something which the class previously struggled with)

Modelled and shared writing techniques were used (already well embedded in literacy) to help children to understand the thought processes and language needed to write an effective reflection

The use of Dear Chloe's was developed to give children opportunities to discuss ideas and interesting elements of investigations.

Pink and green marking was used to edit and improve reflections (already well-established in literacy writing)

What specific teaching resources did you use?

Nrich reasoning skills article

Camden-led Partnership assessing reasoning documents

Scaffold bank to support teachers in creating effective scaffolds

Word banks to help children to complete scaffolds

Outcomes and Impact

What has been the impact on pupil learning and teaching?

I am now far more structured in my approach to reflections in maths lessons. I am able to identify and pre-empt interesting aspects of investigations and more rigorous in my modelling of certain skills.

I feel even more confident to support colleagues across the school to tailor scaffolds to their children and the investigations being undertaken

Children's' awareness of the importance of expressing and discussing in maths has improved.

Children are generally more willing to share ideas and there are for more occurrences of children spontaneously commenting on patterns or interesting aspects of investigations.

The quality of talk during investigations has improved as has the quality and focus of written reflections.

Evidence of impact on pupil learning and teaching/leadership

Weekly planning has a place for scaffolds to be pre planned as part of the lesson planning process.

Scaffolds are being used effectively across the school and this needs to be consolidated and developed.

Although overall attainment is not high in the class, the impact of the scaffolding is evident in both attitudes and children's' willingness and ability to undertake investigative tasks.

This has been part of a wider initiative with the class which has drastically changed attitudes towards and confidence in maths.