Primary & Early Years Magazine 97

National Centre for Excellence in the Teaching of Mathematics

In our final magazine of the school year, we look at the phenomenon of maths anxiety, and delve into our rich archive to suggest some maths INSET activities for the start of the next school year. Happy reading and have a restful summer!

Don't forget all previous issues are available in the Archive.

School-based maths INSET: what will staff at your school be learning next year?
Starting to think about INSET and staff training for September? Our recent series of features, Maths in the Staff Room, offered guided and resourced sessions for short (one or two hours) professional development meetings. In this article, we've reviewed those most currently relevant, and picked out some favourites, also suggesting how they might be run together or consecutively to form more extensive staff development in the areas of mental maths, and calculation.

Maths Anxiety: are you passing it on to your pupils?
Probably you have observed some association between maths anxiety and poor performance – but did you know that it is shown to affect the working memory? Did you know that girls report getting maths anxiety more than boys, and that teachers with maths anxiety can pass it on to pupils? What strategies do you have for reducing maths anxiety for yourself and for your pupils? Here we take the opportunity to familiarise you with the Espresso feature from Cambridge Mathematics: the most recent example focuses on maths anxiety.

And here are some other things to draw to your attention:

- In the last issue, we featured a group of schools in North London working together to find effective ways to help pupils learn and use times tables knowledge. They've now made a video of their experience.
- Another video in our series of school leader interviews recently went live: this one is from Wath Primary CE Primary School in South Yorkshire. In this 25-minute interview, the headteacher gives a management perspective on how teaching for mastery has been introduced at the school.
- Did you miss seeing Chinese teachers teaching maths lessons in England earlier this year? This video of a Y6 fractions lesson in Guildford captures a flavour of their lessons. There is also a video of the post-lesson discussion with local teachers. There will be opportunities to observe more Shanghai teachers in England in November/January in the next academic year – contact your local Maths Hub for details.
- Mathematical Salad from Cambridge Mathematics, offers the latest news stories, blogs and hand-picked morsels in pithy, digestible chunks. A couple of months ago, they ran a feature on teaching sequences through coding to primary pupils.

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School-based Maths INSET: what will staff at your school be learning in the next year?

Starting to think about INSET and staff training for September? In this issue we are including an overview of the Maths in the Staff Room features from previous editions of the Primary and Early Years Magazine, so that you can pick and mix to create bespoke training for your team.

With a new school year arriving, and perhaps new staff in your team, the autumn term can be a good chance to re-visit key messages about the teaching of maths across the school. If you have done any analysis of your KS1 and KS2 maths SATs papers, there may be particular areas of the curriculum which children in your school find more challenging. You may find the starting point for an INSET or staff meeting session in these features.

Maths in the Staff Room resources provide a simple plan for CPD meetings in your school to be led by a member of your staff. These are short meetings (between 45 minutes and two hours) that can be used exactly as indicated, or adapted to meet the CPD needs of the school. Each has clear aims, timings and editable resources, supplied to enable flexibility of delivery.

Below are some of our favourites, and you can find a list of all Maths in the Staff Room features in our archive.

Issue		Theme
70		Mental Fluency
71		The Importance of Counting
72		Representations for number
74		Dialogic Teaching
76		Maths Homework
77		Organising Mathematical Learning
79		Reasoning in the Classroom
80		Understanding key mathematical structures. Part 1: 'Doing and undoing'
81		Understanding key mathematical structures. Part 2: 'Doing and undoing' across the curriculum
82		Understanding key mathematical structures. Part 3: Does order matter?
83		Understanding key mathematical structures. Part 4: 'Always, sometimes, never'
84		Learning from Misconceptions
85		Use of elicitation tasks in teaching and assessing
86		How understanding equivalent calculations can be used as an efficient mental strategy

By grouping the sessions, you can explore key elements of the primary mathematics curriculum in depth:

'Mental maths': a pair of related sessions

Issue 70: To establish a common understanding of what it means to work mentally with fluency

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The Mental Arithmetic paper may have gone from the SATs but children still need to be fluent with mental methods so that they can work efficiently, flexibly and accurately. Through a series of

activities and video clips you and your colleagues will be able to explore the importance of mental fluency and ideas to use in the classroom to support children in developing this aspect of their mathematics. It's your chance to be Rachel Riley (or Carol Vorderman, if you prefer)!

Issue 86: How understanding equivalent calculations can be used as an efficient mental strategy

This meeting allows teachers to develop their own understanding of equivalent calculations and how to model structures of calculation so that the children develop a deeper understanding which they can then apply in different situations.

'Calculation' in six related sessions

If calculation is a focus for your school, then the sessions in Issues 72, 80 - 83, and 86 would provide teachers with opportunities to explore key structures and representations which underpin teaching and learning in this area of mathematics.

Based on John Mason's work on the importance of representations, the session in Issue 72 asks staff to consider representations of five, how these are related, and what the different representations offer children in terms of understanding 'five-ness'.

Issues 80-83 form a four-part series addressing mathematical structures. Staff are encouraged to identify where the different structures occur in the curriculum, and how children can be supported in identifying and understanding them in terms of context, physical movement, in pictures and in symbols.

- 80 - Doing and undoing in maths (for example, adding and subtracting)
- 81 - Doing and undoing in other subject areas (for example, scales up and down in music), emphasising that being numerate across the curriculum - attitudes of mind, problem solving, reasoning and decision making - is one way to embed the aims of the National Curriculum, and is different to trying to cover mathematical content in other subjects
- 82 - When order matters (for example, when dividing 6 and 2, but not when adding them)
- 83 - 'Always, Sometimes, Never' activities to help children avoid overgeneralising rules from a structure (for example, adding two numbers together always makes a bigger number).

The session in Issue 86 develops understanding of equivalent calculations so that teachers can help children use them to spot efficient strategies in mental calculation.

Most importantly, make the most of your staff meeting time: do some maths together, discuss how you teach maths, share how you plan for progress and how you engage children in their learning. This is the time where a buzz about maths is born and nurtured both for the children and for you.

Maths Anxiety: are you passing it on to your pupils?

What the research says: filtered and distilled

In this issue, we are pointing you to the most recent Espresso from Cambridge Mathematics, distilling the latest good-quality research on Maths Anxiety.

Probably you have observed some association between maths anxiety and poor performance – but did you know that it is shown to affect the working memory? Did you know that girls report getting maths anxiety more than boys, and that teachers with maths anxiety can pass it on to pupils? What strategies do you have for reducing maths anxiety for yourself and for your pupils?

Espresso is a relatively recent offering from Cambridge Mathematics, for teachers with an interest in academic findings. Engaging with educational research can be hard-going and time-consuming, and there has traditionally been little expectation for teachers in this country to keep abreast of the current academic thought beyond their initial training. However, there is a growing expectation on schools to have an eye on the 'evidence base' for anything new they might try. Describing itself as "a small but intense draught of filtered research on mathematics education, expressly designed with teachers in mind", each Espresso considers, in two pages, a particular issue in mathematics education, and how the latest good-quality research can provide helpful guidance or further reading. Recent topics addressed include number sense, attainment grouping, learning and assessing times tables, and more.

Maths Anxiety was also the topic for our weekly #mathscpdchat discussion in September 2015. Promoting the idea of 'growth mindset' is one strategy that may help reduce maths anxiety. You can read more about a Sheffield school using it effectively in our case study. Or you can watch the children from an Oxfordshire school talking about how they embrace making mistakes as a positive process in learning, in this video from the GLOW Maths Hub (it can also be viewed on their YesUCan webpage).