Mastery and fluency: Improving fluency and recall of number facts in a primary school.

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In what way were you planning to develop Mastery in fluency?

The aim of my project was to improve the fluency and recall of number facts across the school so that these key facts can then be transferred to other learning. This would enable staff to plan lessons and activities that support children in mastering skills whilst knowing that pupils were confident with their times tables and other associated facts which they would need when mastering skills.

Why did you choose to develop mastery and fluency in Mathematics?

I chose this area because I have noticed from lesson observations and book scrutinies that children can sometimes make less progress when learning new skills because they are unsure of their basic number facts and therefore cannot apply these facts to their new learning. The National Curriculum for maths aims 'to ensure that all pupils become fluent in the fundamentals of mathematics including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.' I therefore believe that if we can ensure the children are fluent in their basic number facts we will be able to develop their conceptual understanding more effectively.

What did your project involve?

I introduced staff to an initiative called Fast Learning, which we trialled in the Autumn term from Year 2 to Year 6. The aim of Fast Learning is for children to answer 100 calculations on a 10x10 grid in under 10 minutes, demonstrating their fluency with the number facts. Children are provided with an answer grid which they can use to help them find the answers if needed. If children cannot complete the grid in under 10 minutes they record the number of calculations they got correct – giving themselves a score. Children only compete against themselves and aim to score a personal best (PB) by improving their score or time each day. If children make 3 or more mistakes on their grid they get a score of 0 for that day. This encourages the children to make sure they are accurate with their calculations. After the first few days very few children were receiving a score of 0, showing they were quickly becoming accurate.
Years 2, 3 and 4 began with learning their addition facts for up to 10+10. Year 5 and 6 focused on learning their times tables up to 10x10, with some Year 6 children moving onto a 12x12 grid and completing 144 calculations in the set time.

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What did you find out throughout carrying out your project?

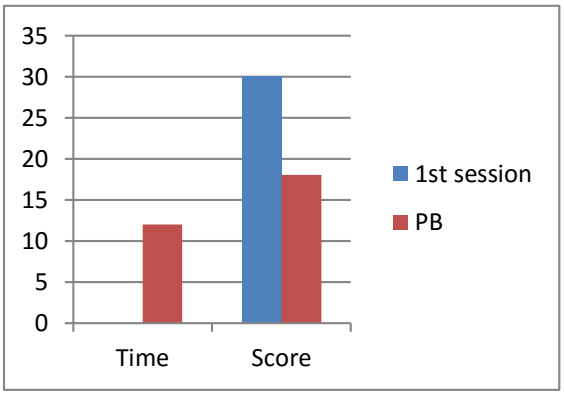
Working on this project made me really think about how, as a school, we were supporting the children in mastering the skills we are teaching them in the new national curriculum and what else we could do to support them in this.

Improving the children's fluency and recall in their number facts is the first step towards this, and once we have developed this we will be able to really focus on teaching for mastery.

What differences did it make to your learners?

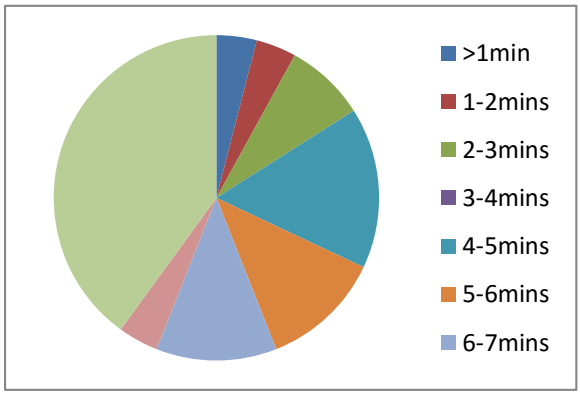
The children have shown a real enjoyment for Fast Learning, and it is often the first thing they ask about each morning. It has motivated them and they love trying to beat their own PB. I analysed the data of all the year groups and it shows a vast improvement in all children's times or scores, illustrating their increased fluency with the number facts.
The following graphs compare the initial results with the children's PB at the end of the 6 week initial trial of Fast Learning.
Initially, the majority of children in the school were unable to complete the grids in the set time and were therefore only achieving a score. By the end of the 6 weeks, large percentages of the classes were completing the grids in under 10 minutes.

Year 2



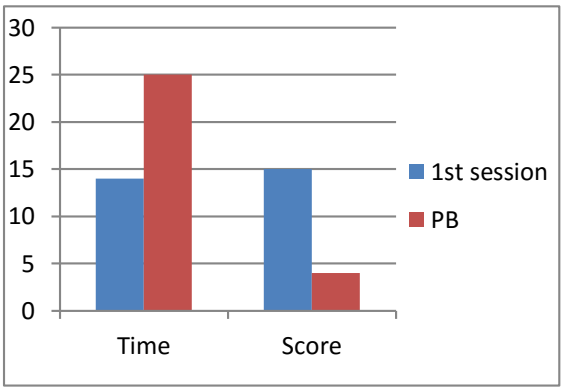
40% of the class were able to complete the grid in under 10 minutes.

Year 3 (improvements in time taken to complete the grid)



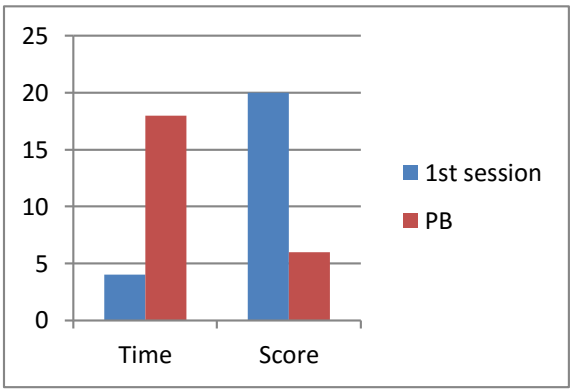
40% of the children improving their time by 8 minutes or more.

Year 4



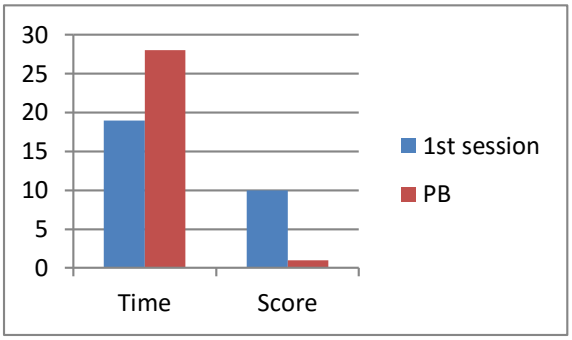
86% of the class were able to complete the grid in under 10 minutes, with 58% of the class completing it in under 5 minutes.

Year 5



75% of the class were able to complete the grid in under 10 minutes, with 24% of the class completing it in under 5 minutes.

Year 6



96% of the class were able to complete the grid in under 10 minutes, with 83% of the class completing it in under 5 minutes.

What difference did it make to your school?

Children are more fluent with their number facts and the data from the Fast Learning shows they are able to recall them much quicker and more accurately than they were before we started.

This means that teachers will be able to focus their lessons on helping children master new skills, and children will not be hindered by being unable to recall their addition or times tables facts.

Using the Fast Learning approach will mean that, over time, the children will know their multiplication facts for up to 12x12 by the end of Year 4, as outlined in the national curriculum.

Next steps.

The use of Fast Learning across the school will be an ongoing process during this year and will develop to suit the needs of the children.

- For the first half of the Spring term, children in Years 3 and 4 have moved onto learning their multiplication facts. At the end of the half term I will again analyse the data to see if they have made the same level of improvement.
- Year 1 are beginning a variation of Fast Learning, which is helping them become more fluent with writing their numbers to 100 quickly and accurately.
- Year 2 will continue with learning their addition facts, as there is still room for improvement in their fluency. In the first half of the Summer term we are going to trial Fast Learning with subtraction facts in Year 2.
- In the second half of the Spring term we will be trialling Fast Learning with recalling multiplication facts and the corresponding division facts in Years 5 and 6.
- In the Summer term we will go back to the set of facts each year group initially focused on to check they have retained that information.

During the remainder of this academic year we will assess whether the improved fluency and recall of these number facts is having an impact on other areas of maths, and allowing children the opportunity to master new skills rather than focus on these foundational skills.

The staff will be introduced to the use of the mastery documents to support them with planning activities to deepen children's understanding of the skills they have been taught and to assess the depth of this mastery.