

Raising The Game: Improving Maths Outcomes For Primary School Pupils

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



Key Points

Eleanor Palmer leads a Teaching School in Camden. We organise and lead the Camden Primary Maths Hub, in which 24 local schools work together to develop and celebrate good practice. KS2 levels of achievement in our schools are above the national average, and we are proud of the work we do, but we worry about the slower rates of progress of some of our most disadvantaged pupils. To tackle this, we have developed and piloted a 'games playing' approach in Year 2. Our conviction is that structuring games playing around maths, using the principles of [serve and return](#) interaction, helps to strengthen fluency, understanding and reasoning. The result of the pilot has been a dramatic improvement in outcomes in participating schools. While *none* of our targeted Year 2 children were at expected levels at the start of the project, 43% of them had reached expected levels at the end. And the confidence of the children in being able to do maths – and the confidence of the teaching and support staff to teach it – improved markedly.

Purpose

What were your reasons for doing this development work?

Diminishing differences

Our approach to maths teaching owes much to the *Teaching of Mastery* – based on best practice from the Far East – with its emphasis on teaching for understanding and on fluency. The attainments of our children validate this approach, but the gap in the rate of progress between our disadvantaged and 'non-disadvantaged' pupils has remained a persistent concern. We felt that these children deserved better, and we were determined to do something about it.

Who were the identified target learners?

The pilot, using funding from the Richard Reeves Foundation, was aimed at disadvantaged Year 2 children:

- Every participating child had to be FSM/PP **and** be performing below expected levels: i.e. *not on track to reach expected levels at the end of Year 2*.
- 18 of our Hub schools asked to be involved, but time constraints and the criteria for disadvantage meant restricting participation to nine schools.
- Four children were targeted in each school: 36 in all (although one left during the pilot).

What were your success criteria?

Using 'structured games'

We believed that a games-based approach would provide a way. Games don't really feature in the Mastery approach; in fact, games are rarely seen as useful interventions or purposeful learning tasks.

But we wanted to:

- 'talk maths' with children in a context that was fun and in which the children didn't feel beaten before they started;
- test out the effectiveness of games in diminishing differences;
- focus not simply on teaching games, but rather on *using games as a maths intervention*;
- build and strengthen '**Serve and Return**' interactions between children and significant adults to develop reasoning.

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

- We started with a pool of 8 games, which expanded to 24 over the year.
- All the games were devised by the project leads, and each focused on one or two key teaching points.
- The games were accompanied by simple but specific guidance for the participating teachers and TAs, rooted in *Serve and Return*
- Adults were coached in:
 - specific lines of questioning to develop thinking;
 - how and what to observe;
 - how to assess;
 - how and when to intervene.
- The chosen games were played repeatedly and often within this framework.
- Participating schools used the games for a minimum of 15 minutes, three times per week. Sessions were either before school, during lunch time, or after school.

What specific teaching resources did you use?

We used the *White Rose* framework to assess baselines and progress, as well as predicted and actual SAT levels.

White Rose Arithmetic: average score gain over the school year 3.3

White Rose Reasoning: average score gain over the school year 4.8

SATs

- Start of year: none at expected levels
- End of year: 15 / 35 at expected levels (43%)

Outcomes and Impact

What has been the impact on pupil learning and teaching?

- We used an *Additive Grid* to measure each child's progression in recall of core

additive facts across the year. This showed an average score gain of 61 points over the year, almost 3 times the original scores.

- We believe that this represents a remarkable progress boost for some of our most disadvantaged pupils, and that it demonstrates the ability of these children to learn and achieve when given opportunities to over-learn, repeat and reason about core facts in a fun and supportive way.

- Many of those who 'failed' to reach the 'expected level' were actually very close to it, and benefited from the approach.

Evidence of impact on pupil learning and teaching/leadership

- Our pre- and post-pilot surveys showed a very sharp increase in how much the pupils involved seemed to enjoy maths.

- The participating teachers and TAs also benefited. Before and after surveys showed marked improvements in:

- their confidence in teaching and supporting maths learning;

- in using questions to do this;

- and in their understanding of how games can boost attainment.

- Feedback from the teachers and TAs involved was exclusively positive. Rather than just been given sheets of games, it was the time together in CPD, and the in-school visits to the group, that generated their commitment and motivation. We have enormously supportive quotes from almost all of them: this is just one:

“What an incredible project! We’ve seen a huge improvement in children’s engagement, confidence and most importantly love of maths! The games are so engaging and targeted. Now everybody in the school wants to play and they shall!”

What made the difference

We believe that these were the key factors in the better progress of those children that flourished most:

- There was a noticeable change in their *mindset* about maths: more 'can do' than 'can't do'.

- Parental interest and engagement were stronger.

- A more instinctive competitiveness was apparent in their games-playing, motivating them to think fast.

- They had stronger starting points – 'more facts in the bank'.

- Their attendance was better.

- More of them had English as a first language; the majority of those who did not reach expected levels had English as an additional language.

- Where the lead 'pilot' teacher was also the Year 2 class teacher, it created more opportunities to reinforce learning in general classroom activities.