



## **Let's Think Through Maths! Infant CAME**

*Nicky Zeronian-Dalley*

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### **Introduction**

*What were your reasons for doing this type of development work?*

This development work was undertaken to improve thinking skills in mathematics in KS1 and to develop Using and Applying.

It is based upon the principles of Cognitive Acceleration in Mathematical Education (CAME).

*Who might find this case study useful?*

Teachers, Subject leaders and Middle leaders, Headteachers, Senior Leadership Teams

### **Key Points**

- Improving AT1 in KS1
- Raising attainment in KS1

### **Who**

#### **School and setting**

*School;* 12 schools per year

*Type of School;* Primary

*Local authority;* Kingston upon Thames

*Region;* London

### **Contact(s)**

<b>Name</b>	<b>Type</b>	<b>Email</b>
Nicky Zeronian-Dalley	Author	nicky.dalley@rbk.kingston.gov.uk

### **Learners**

*Year groups;* Year 1 (KS1), Year 2 (KS1)

*Gender;* Both

*Whole school;* Yes

*Teachers;* KS1

*Support Staff;* KS1

*Local authority advisers;* Primary

*Number of classes;* 12

*No. of adult learners;* 12

## **What**

*What specific curriculum area, subject or aspect did you intend to have impact on?*

Mathematics

*What main aspect of pupil learning were you trying to improve?*

Using thinking skills

*How did you intend to impact on pupil learning?*

Increase opportunities for AT1

Raise attainment in AT1

Improve the level of speaking and listening - the quality of pupil discussion, explanation, reasoning and questioning

*What were your success criteria?*

Improve the level of collaborative professional development

Support an increased level of AT1 into teachers' planning

Improve teachers' understanding of AT1

Raise the level of L2+ and L3 at KS1

Accelerate progress in AT1 in Y1 and Y2

*What did you do? What teaching approaches did you use to achieve the intended impact?*

AfL (Assessment for Learning), Use of thinking skills, Use of pupil talk for whole-class teaching, Collaborative group work, Teaching sequences, Simulation

*Describe*

The network of teachers worked together to provide opportunities for children to learn to work in collaboration with the express purpose of developing their thinking about the concepts underlying mathematics. Children worked in near ability pairs on mixed ability tables in order to encourage risk taking, promote discussion and good modelling of language. By encouraging children to make use of their own ways of thinking in contexts within their own experience, each activity was aimed at increasing the child's confidence with mathematics.

*What did you do? What approaches to supporting professional development (CPD) and learning for adults were used?*

Training, Coaching, Modelling, Demonstration, Lesson observation, Lesson study, Classroom enquiry, Partnership teaching

*Describe*

Each session was 1/2 day involving a lesson simulation for one year group, a lesson demonstration in another and evaluation session focused upon the learning that took place.

Teachers initially watched lessons modelled by the course leader or leading teachers then as the course progressed they team taught in pairs with each other's children.

Teachers planned together and carried out observations of particular children. Focus children were identified by class teachers according to ability or level of need; underperforming girls/white boys/more able girls/SEN/EAL/G&T etc

*What CPD materials, research or internal or external expertise have you drawn on?*

Let's Think Through Maths! nferNelson (Now GL Assessment)

<http://shop.gl-assessment.co.uk/home.php?cat=392>

<http://shop.gl-assessment.co.uk/home.php?cat=411>

*How were you supported?*

Senior management level

*Describe*

The senior leadership from each school were involved in ensuring maximum impact of the programme, linking it to the school development plans, primary strategy support agreements, CPD opportunities and action plans. Some schools enabled their own staff to observe lessons when the lessons were demonstrated in their schools. Subject Leaders were also released to observe the programme in action as part of their own development.

*What information or data did you use to measure progress towards and achieve your success criteria?*  
Pupil progress data, Test results, CVA data, Data comparison of cohorts, Observation outcomes, Logs or interviews

## **Impact**

### **Impact on pupil learning**

*What has been the overall impact on pupil learning?*

We are in the second year of this programme. During 2006-7 in the first year, results at L2+ and L3 at KS1 showed a 3% increase over results in schools that did not participate in the project. We expect results to be even higher this year as children will have completed 2 years, both in Year 1 and Year 2. This year we have a new cohort of schools plus those on last year's programme. Teachers have reported an increase in planning Using and Applying Mathematics(UAM) opportunities and the LA have observed much more UAM being planned for and delivered across all strands. Assessment at KS1 is focused upon AT1 and much of the evidence has been submitted from Let's Think Through Maths(LTTM) investigations.

*Thoughts you think are relevant to overall impact on learning*

Children often do not realize that they are actually doing maths. They often say that they really enjoy 'thinking maths'. According to teachers involved, the programme has impacted upon developing thinking skills and engagement with learning but hard evidence has not yet been collected.

*Quotes you think are relevant to overall impact on learning*

'This makes me think really hard'

'I can do really hard thinking like Y6'

*Quantitative evidence of impact on pupil learning*

Pupil progress data, Test results, CVA data

*Qualitative evidence of impact on pupil learning*

Observation outcomes, Logs or interviews, Pupils' work, Learning walks/study visits

*Describe the evidence of impact on pupil learning*

Impact on children's learning is measured by the LA each year in July, comparing attainment and progress of those involved and not involved in the project.

### **Impact on teaching**

*What has been the impact on teaching?*

The programme is part of CPD and is based upon action research, coaching and lesson study. Teachers with a wide range of experience and from different types of schools have team planned and delivered lessons to unknown children. Each lesson is followed by a feedback session where teachers discuss what they might have done differently with other children, what went well and what they might adapt etc.

The programme has also impacted upon teaching by developing a range of teaching approaches and using strategies based upon action research.

*Thoughts you think are relevant to impact on teaching*

Impact on teaching can be seen through the development of individual teachers and the influence that the programme has had on groups of teachers within each school. Teachers have become more familiar with the coaching and lesson study models of CPD and these have been shared amongst their colleagues.

*Quotes you think are relevant to impact on teaching*

'LTTM has given me the confidence to try things that I would not have thought of doing on my own before.'

'It has pushed me out of my comfort zone but given me an opportunity to share good practice and learn from other colleagues outside my own school.'

'Although I am an NQT, I have felt confident enough to take an active role in the CPD programme and teach and observe unknown children.'

*Evidence of impact on teaching*

Teacher perceptions, Evidence from planning, Evidence from observation and monitoring

### *Describe the evidence of impact on teaching*

Teachers evaluate the impact on teaching following each session and again at the end of the course. Impact is also seen through monitoring by SLT and the LA as well as in Assessment at KS1 Agreement Trials.

### **Impact on school organisation and school leadership**

#### *What has been the impact on school organisation and school leadership?*

School leadership teams have begun to acknowledge the impact that the programme can offer and are trying to ensure that it is sustained and developed into Y3 and Y4.

#### *Thoughts you think are relevant to overall impact on school organisation and school leadership*

Impact has been greatest in the schools that see LTTM as more than just a course but rather ongoing, sustained CPD that will have an impact on the teaching and learning of mathematics and the development of thinking skills.

Schools involved in the programme have seen the greatest progress where colleagues and subject leaders have been involved and embedded the lessons into planning.

#### *Evidence of impact on school organisation and school leadership*

This has really moved teachers' thinking forward and empowered staff to take an active role in dissemination.

#### *What is the crucial thing that made the difference?*

What really made the difference was having a learning network enabling teachers to have a professional dialogue about how children learn mathematics which has resulted in raising standards of teaching and learning.

Evidence - Raised standards at KS1 in comparison to those schools that have not taken part.

## **Summary**

#### *What key resources would people who want to learn from your experience need access to?*

Let's Think Through Maths! published by nferNelson:

<http://shop.nfer-nelson.co.uk/icat/4043300main>

<http://shop.nfer-nelson.co.uk/icat/letsthinkthroughmaths69>

Primary CAME training folder published by BEAM:

<http://www.beam.co.uk/training/pcame.htm>

#### *What CPD session and resources were particularly useful?*

Half termly sessions lasting 3 hours each run by the maths consultant.

Maths consultant covered 2 lessons per session and teachers observed one of the lessons taught by a leading teacher, consultant or a participant from the previous year.

#### *If another individual or school was attempting to replicate this work, where would they start and what would the essential elements be?*

Engage with the resources.

Build then into a CPD package focused on teaching and learning.

Focus on dialogic talk, questioning and a coaching model of CPD.

#### *What further developments are you planning to do (or would you like to see others do)?*

Sustain improvement by embedding the resources and methodology in to yearly planning.

## **Related Information**

[A CAME article from the course introduction](#)