London Schools Excellence Fund

Self-Evaluation Toolkit

Final report

LSEF Project 1136

Contact Details
educationprogramme@london.gov.uk

Evaluation Final Report Template

Introduction

The London Schools Excellence Fund (LSEF) is based on the hypothesis that investing in teaching, subject knowledge and subject-specific teaching methods and pedagogy will lead to improved outcomes for pupils in terms of attainment, subject participation and aspiration. The GLA is supporting London schools to continue to be the best in the country, with the best teachers and securing the best results for young Londoners. The evaluation will gather information on the impact of the Fund on teachers, students and the wider system.

This report is designed for you to demonstrate the impact of your project on teachers, pupils and the wider school system and reflect on lessons learnt. It allows you to highlight the strengths and weaknesses of your project methodology and could be used to secure future funding to sustain the project from other sources. All final reports will feed into the programme wide meta-evaluation of the LSEF being undertaken by SQW. Please read in conjunction with Project Oracle's **'Guidance to completing the Evaluation Final Report'**.

Project Oracle: Level 3
Report Submission Deadline: 30 September 2015
Report Submission: Final Report to the GLA

Project Name: Extending More Able Mathematicians
Lead Delivery Organisation: Ridgeway Primary School
London Schools Excellence Fund Reference: 1136
Author of the Self-Evaluation: Jonathan Smith
Total LSEF grant funding for project: £85,880
Total Lifetime cost of the project (inc. match funding): £85,880
Actual Project Start Date: 12th November 2013
Actual Project End Date: 17th July 2015
(The dates above show when project work directly engaged with teachers & pupils started and finished.)

1. Executive Summary

This final report is based on an evaluation of the Extending More Able Mathematicians (EMAM) project. The rationale for this project was based on the fact that more able mathematicians are often not fully challenged or engaged in lessons, which can mean they do not reach their full mathematical potential. While the initial target group was more able mathematicians, the strategies and resources were applied to pupils of all abilities. 23 schools were involved in the project over its 2 year span, comprising of 19 primary schools located in the London Borough of Croydon; 2 primary schools located in the London Borough of Merton and 2 secondary schools (one located in Croydon and one on the Croydon/ Surrey border). Each school nominated one teacher who regularly attended CPD training aimed at improving teachers' subject knowledge, confidence and subject specific pedagogy. Whole school CPD was also provided as part of the overall programme to schools to support the wider implementation of project strategies. The evaluation of the project demonstrated the following findings:

- Problem solving has been used to successfully challenge and extend pupils' mathematical knowledge, application of skills, and reasoning. Pupils are more skilled

at recording their mathematical thinking and can more effectively communicate and discuss their thoughts. This has become embedded as a core aspect of pupils' mathematical skills.

- Teachers have successfully adapted lessons so they spend quality time with specific ability groups during each lesson, enabling them to tailor teaching more specifically, and more immediately, to the needs of small groups and individuals.
- Teachers have a deeper, more thorough understanding of their pupils as mathematicians. Teachers and pupils engage in a continuous process of assessment and feedback, which enables deeper, more thoughtful learning and accelerates pupils' progress. Pupils are more challenged and consequently are more engaged.
- Teachers have access to a wider range of resources that enable them to challenge and extend the learning of their pupils. Teachers are now beginning to explore how to adapt and create their own resources.
- Although the project's stated target group is more able mathematicians, teachers have reported that a positive impact is evident in pupils of **all abilities**.
- Analysis of year 1 data demonstrated a statistically significant improvement in pupil progress and attainment, whereas analysis of year 2 data did not demonstrate a change in progress or attainment.
- The use of inspirational guest speakers has enhanced the effect of the project as they have echoed the key messages and strategies. Engaging parents through the guest speaker events has further widened the impact of the project's activities.

Recommendations for the delivery of similar projects in the future would be:

- Begin CPD work with teachers as early in the academic year as possible to help maximise the impact of the intervention.
- Due to the limited time available for teachers to reflect on and implement new methods, intervention strategies and activities must be quick and easy to apply by teachers to maximise development of their practice. Providing non-contact time away from regular class duties supports them in doing this.

2. Project Description

More able mathematicians are often not fully challenged or engaged in lessons, which can mean they do not reach their full mathematical potential. Three reports published prior to the project's commencement (two of which were released in the year prior to the project) highlight this need. The first, '*Mathematics: Understanding the Score*' (OFSTED 2008), highlights how and why practice in primary mathematics required improvement.

- "high attaining pupils require greater challenge in lessons: many primary teachers need stronger subject knowledge to do this well. It is of vital importance for pupils of all abilities to shift teaching and learning in mathematics away from a narrow emphasis on disparate skills towards a focus on pupils' mathematical understanding."
- "The report describes how the best teaching in both phases is enthusiastic, knowledgeable and focused clearly on developing pupils' understanding of important concepts. Good assessment throughout each lesson enables teachers to see how pupils are thinking and to adjust teaching and learning strategies accordingly. By developing pupils' mathematical independence, teachers also equip them for success in national tests and beyond."

http://www.suffolkmaths.co.uk/pages/Teaching%20Skills/Good%20lessons/Improving%20Primary.pdf

The second report, '*Mathematics: made to measure*' (OFSTED, May 2012), built on the 2008 report. It highlighted the following points:

- "Teachers' use of assessment to promote learning has improved since the previous survey, ***but the quality of teaching and curriculum planning was much the same***."
- "***Improving the consistency and quality of teaching within a school is crucial*** if all pupils, rather than some, are to make sustained good progress. ***It is important to have clear guidance, understood by all staff, on approaches to secure conceptual understanding and progression in lessons***."
- "***The best teaching developed pupils' conceptual understanding alongside their fluent recall of knowledge, and confidence in problem solving***, too much teaching concentrated on the acquisition of disparate skills that enabled pupils to pass tests and examinations but did not equip them for the next stage of education, work and life."
- "Very few schools provided curricular guidance for staff, underpinned by professional development that ***focused on enhancing subject knowledge and expertise in the teaching of mathematics, to ensure consistent implementation of approaches and policies***."

The report also stated that: "Inspection evidence showed very strongly that…schools whose mathematics work was outstanding had a consistently higher standard of teaching, better assessment and a well-organised, mathematically rich curriculum. They used a variety of strategies to improve all pupils' learning of mathematics, such as revising schemes of work, [and] helping staff to enhance their subject expertise..."
https://www.gov.uk/government/publications/mathematics-made-to-measure

The third report, '*The most able students: examining failure to achieve*' (OFSTED June 2013), focussed on weaknesses in secondary mathematics provision, although has implications for a need to improve practice and standards in primary mathematics to provide pupils with the skills, understanding and confidence that will enhance their chances for success at secondary school
https://www.gov.uk/government/publications/are-the-most-able-students-doing-as-well-as-they-should-in-our-secondary-schools

A follow-up report, '*The most able students: an update on progress since June 2013*' (OFSTED 2015), highlights the need for more to be done and specifies some of the areas of improvement as thus:

- ***develop a culture of high expectations for students and teachers*** in Key Stage 3 and ***rapidly improve the quality of curriculum delivery, teaching and assessment***, especially in foundation subjects,
- ensure that teachers and leaders in Key Stage 3 use information held by primary schools about students' learning and achievements in Key Stage 2 effectively, so that ***work for the most able students provides the right level of challenge***
- ***provide training for teachers of all key stages so that their teaching routinely challenges the most able students***
- ***ensure evaluations of curriculum delivery, teaching and learning in Key Stage 3 are robust and lead to rapid improvements***;

https://www.gov.uk/government/publications/the-most-able-students-an-update-on-progress-since-june-2013

The objectives and actions carried out through the "Extending the Learning of More Able KS2 and KS3 Pupils in Mathematics" (EMAM) project aimed at addressing these problems, as well as other related issues.

In 2012-2013, prior to the LSEF programme, the project lead was commissioned to design and implement an action research project (under the coordination of the Croydon AST

programme) to address an identified weakness in the mathematics provision for more able pupils. Through analysis of assessment data, borough officials had identified a lack of higher attaining primary and secondary age pupils at both borough and national level. The project lead was asked to deliver a school improvement programme aimed at accelerating the progress and improving the attainment of higher attaining year 6 pupils. A cluster of 6 Croydon primary schools benefitted from the work of this 'pilot' project. The project involved the delivery of multiple, high-quality CPD days for teachers and outreach support in the 6 schools. The project lead has previous experience of successfully supporting teachers through outreach support, but by creating a small cluster of teachers, this support could be distributed to a wider audience. The CPD days allowed for the delivery of quality first teaching strategies and key understanding of outstanding mathematics pedagogy, while the outreach allowed for tailored support to meet the needs of each individual teacher in their diverse school environments. The successful impact of the strategies used in this "pilot" project (measured using quantitative and qualitative feedback), formed the foundation of the structure and content of the LSEF project.

In order to constantly challenge more able mathematicians to ensure rapid and sustained progress and high levels of attainment, the "Extending the Learning of More Able KS2 and KS3 Pupils in Mathematics" (EMAM) project aimed to develop teachers' subject-specific pedagogy, as well as their knowledge and understanding of the Maths curriculum. This project aimed to strengthen pupils' understanding of Maths and ensure rapid, sustained progress and high levels of attainment in KS2 and KS3. Pupils were given opportunities and support to extend and broaden their mathematical knowledge and understanding, as well as their skill, confidence and enthusiasm for tackling challenging mathematical problems.
Results show that teachers improved their subject knowledge, enhanced their pedagogical skills and were provided with high quality, practical resources that enabled them to constantly challenge and extend their more able mathematicians. The positive impact on pupils was evident through their improved progress and attainment.

The project has been delivered through a variety of CPD activities including:

- **5 CPD days** during the academic year - 3 CPD days were run by a leading practitioner and 2 days were self-directed study days for teachers to reflect on and develop changes to their practice.
- **2 outreach support visits** from a leading practitioner to support the implementation of suggested strategies, which were tailored to the individual needs of each teacher.
- **1 whole staff CPD training session** provided by a leading practitioner and aimed at extending the impact of the project to all teachers within each school.
- **Whole staff CPD events with guest speakers** were provided for the benefit of all teaching staff in each school. In year 1 this comprised of two, single speaker events run in April and June. In year 2 this comprised of one single speaker event (in October) and a Maths Conference (in April) with multiple guest speakers, each targeting specific Maths skills and phase groups. The guest speakers were selected for their expertise in the area of mathematical pedagogy.
- **Parent workshops with guest speakers** were run by the same guest speakers as for the staff events (two in year 1 and one in year 2), but were aimed specifically at engaging a parental audience to advance their understanding of how to support their children's mathematical development, and why such a focus is crucial.
- **A Pupil Maths Day** was run in year 1, during which more able pupils from each school had to collaborate to solve a range of mathematical challenges.
- **Follow-up network meetings and ad hoc support** was provided to year 1 schools during year 2 to maintain momentum of the project strategies, specifically supporting teachers with reflecting on their professional development and implementing best practice more widely in their schools.

The cluster of 23 schools engaged with the project included both primary (21) and secondary (2) schools from different areas of Croydon (20), Merton (2) & Surrey (1), all serving a diverse demographic of Croydon and Merton's populations. Schools were introduced to the project's aims and offered the chance to join, and all chose to take part. Some schools were already known to the delivery school (Ridgeway) through an existing local cluster, some were recommended to join the project by the Croydon Link Advisors, while some (in year 2) responded to marketing material distributed to every primary school in Croydon offering them the opportunity to take part. The two Merton schools joined following meeting the project lead at an unrelated CPD/networking event for school leaders (operated by the South West London Schools Education Partnership). Each school was asked to nominate one teacher as their main participant, who would also act as the lead for the future development of the project strategies (i.e. schools wide and on school policy) within their school. The project aimed to establish a network that fostered dialogue, knowledge sharing and partnerships between participating teachers. Regular meetings and events helped strengthen these relationships, with the ultimate aim that the network continues beyond the lifespan of the project. Within each school, tailored training and support was offered to provide professional development to teachers not on the project, thus impacting all teaching staff in the whole school. Teachers participating in the project, were provided with training and support to enable them to disseminate strategies more widely in their schools – therefore each school now has an expert able to support and encourage the professional development of colleagues within their school communities. Consequently, the outcomes have, and will continue to, spread more widely in each school, in a snowball effect. On completion of the training, cluster schools will be encouraged to set up networks to share their expertise with other schools.

The pupils being targeted by the project were more able mathematicians. Decisions about which pupils are considered "more able" were made by the individual teachers participating in the project. However, one of the project's aims was to ensure that the more able group contains pupils who had the ***potential*** to make rapid, sustained progress and high levels of attainment, rather than being bound by rigid measures prior to the project (i.e. not only pupils who in the baseline measurement had reached specified levels of attainment). In the first year, the project targeted year 6 pupils only, while this was widened to pupils in years 5, 6 and 7 in the project's second year. Although more able mathematicians were the specified target group, the strategies, resources and professional practice developed through the project had a positive impact on pupils of all abilities.

The project was developed so that it supported teachers in the transition to the new national curriculum.

The project used a range of quantitative and qualitative evaluation methods. Impact on teachers was measured using: a self-assessment survey (including scores for confidence, subject-knowledge and subject-specific pedagogy); headteacher evaluation of teachers' effectiveness; and regular written self-evaluation feedback. Impact on pupils was measured by collecting end of year assessment data (for the intervention year and 3 previous academic years); historical assessment data for a comparison group at each school; a sample of pupils' responses during lessons; teacher evaluation feedback about their pupils' (including pupils' attitude, confidence and approach to Maths). The evaluation aimed to seek evidence of the impact of the intervention on teachers' pedagogy and subject-specific knowledge, as well as pupils' progress, attainment, confidence and attitude to Maths.

3. Theory of Change and Evaluation Methodology

Please attach a copy of your validated Theory of Change and Evaluation Framework.

3.1 Please list **all** outcomes from your evaluation framework in Table 1. If you have made any changes to your intended outcomes after your Theory of Change was validated please include revised outcomes and the reason for change.

Table 1- Outcomes

Description	Original Target Outcomes	Revised Target Outcomes	Reason for change
Teacher Outcome 1	Increased teacher confidence	N/A	N/A
Teacher Outcome 2	Delivery of higher quality teaching including subject-focussed teaching methods in Maths	Addition of: "in Maths"	To make target outcome more specific
Teacher Outcome 3	Use of better subject-specific KS2 and KS3 Maths resources	Addition of: "KS2 and KS3 Maths"	To make target outcome more specific
Pupil outcome 1	Increased pupil educational attainment and progress in Maths	Addition of: "pupil" and "in Maths"	To make target outcome more specific
Wider system outcome 1	Teachers/schools involved in intervention making greater use of networks, other schools and colleagues to improve subject knowledge and teaching practice	N/A	N/A

3.2 Did you make any changes to your project's activities after your Theory of Change was validated? **NO**

If **Yes**, what were these changes (e.g. took on additional activities?)

3.3 Did you change your curriculum subject/s focus or key stage? **NO**

If **Yes**, please explain what changes you made, why, and provide some commentary on how they affected delivery.

3.4 Did you evaluate your project in the way you had originally planned to, as reflected in your validated evaluation plan? **YES**

4. Evaluation Methodological Limitations

4.1 What are the main methodological limitations, if any, of your evaluation?

- Teacher subject knowledge was measured using a survey which asked teachers to rate their own confidence in certain subject areas rather than an objective subject knowledge test and may therefore be impacted by certain factors including: the time of year the measures were taken (i.e. early in the year when the pressure of meeting targets can be felt, as opposed to later in the year once SATs tests have been completed); subjective bias (i.e. teachers wanting to believe they have improved their practice).
- Standards of teaching quality were measured through before and after assessment summaries (often involving lesson observations) provided by headteachers in the project schools. Headteachers evaluated the teaching quality of their own teachers, which has the benefit of them being able to offer qualitative evidence and narrative around noticeable improvements (particularly important when the numerical scale being used to measure quality is only 1-4 in line with OFSTED judgements about teaching quality). In an ideal scenario, the evaluation of teaching quality would have been conducted or moderated by an external evaluator, although there was insufficient finance for or time to organise an external evaluator for this purpose. Another improvement could have been for headteachers to assess the quality of teaching of teachers from schools other than their own. However, limits on individual teachers and headteachers' time, as well as logistical constraints, made this impractical.
- It is difficult to measure the degree to which teachers are using the new, subject-specific resources and how effectively they are using them. Teachers have indicated on a scale from 1-5 the resources they have available to extend more able pupils following intervention and have also included qualitative feedback about the impact of the new resources, although this measure has the potential for subjective bias.

- The sample size of the pupils (610 total pupils; 302 more able pupils) is relatively small.
- Data was only received from one of the two secondary schools and of the data received there were 26 pupils in the target group and 58 pupils in the historical comparison group. Therefore, only a limited amount of data analysis could be conducted, from which it would be difficult to draw any conclusions.
- It was not possible to find a concurrent pupil comparison group (see below), although historical data was gathered for the previous three years from each school and this was used as a comparison group. The historical comparison group consisted of 698 pupils from year 1 schools and 1097 pupils from year 2 schools.
- Teachers reported on the confidence and skill of pupils, although this measure is open to subjective bias.
- The introduction of a new National Curriculum (NC) and the removal of the universal summative assessment (NC levels) system in September 2014 meant that in year 2, many of the project schools were using new assessment systems (many were bespoke to individual schools), with different assessment criteria to those used by schools in year 1 (who were using the now redundant NC levels system). In addition, the year 5 pupils (167 pupils) were being taught the new Maths curriculum, while the year 6 pupils (184 pupils) were still being taught the old Maths curriculum, each with different assessment criteria. Since they were no longer using the old levelling system, in year 2 some teachers submitted pupil data as a "best fit" based on a comparison between their new, bespoke levelling system and the old levelling system. The changes to the curriculum and the assessment systems were a limitation beyond the control of the project.

- Some moderation of pupils' assessment data was conducted in year 1. However there was not sufficient time for a similar moderation in year 2.
- Some schools did not submit current or historical assessment data, or did not do so correctly and therefore the data could not be used as part of the project evaluation.

- The ability of trained teachers to be able to support and extend the project strategies and network were measured using self-assessment and qualitative feedback, which is open to subjective bias.
- Not all teachers attended every CPD session, which meant that their ability to (and feedback about the success of) extending the project network was limited.

4.2 Are you planning to continue with the project, once this round of funding finishes? **NO**

If **yes**, will you (and how will you) evaluate impact going forward?

5. Project Costs and Funding

5.1 Please fill in Table 2 and Table 3 below:

Table 2 - Project Income

	Original[1] Budget	Additional Funding	Revised Budget [Original + any Additional Funding]	Actual Spend	Variance [Revised budget – Actual]
Total LSEF Funding	£75,880	£10,000	£85,880	£85,880	£0
Other Public Funding	£0	£0	£0	£0	£0
Other Private Funding	£0	£0	£0	£0	£0
In-kind support (e.g. by schools)	£0	£0	£0	£0	£0
Total Project Funding	£75,880	£10,000	£85,880	£85,880	£0

List details in-kind support below and estimate value.

In-kind Support

Use of office space and access to computers, printers etc. for the project lead (it is not possible to estimate this cost)
Venues for CPD sessions and events (~£5,000)
Administrative support (~£5,000)

Table 3 - Project Expenditure

	Original Budget	Additional Funding	Revised Budget [Original + any Additional Funding]	Actual Spend	Variance Revised budget – Actual]
AST time - leading project	£30,000		£30,000	£33000	-£3,000
AST time - staff meetings	£3,600		£3,600	£3,600	£0
AST time – write up and publish findings	£5,000		£5,000	£5,000	£0
Marketing & publicity	£1,000		£1,000	£1,000	£0
Teacher Supply / Cover Costs	£20,280		£20,280	£16,731	£3549
Maths training for schools	£10,000		£10,000	£10,000	£0
Parental events	£5,000		£5,000	£5183.29	-£249.29
Resources	£1,000		£1,000	£1,299.70	-£299.70
Data analysis		£10,000	£10,000	£10,000	£0
Total Costs	**£75,880**	£10,000	**£85,880**	**£85,880**	**£0**

5.2 Please provide a commentary on Project Expenditure

There was a slight underspend (£3,549) on teacher cover costs, because not all participating teachers, for a variety of reasons, attended every CPD day and some schools did not claim their cover costs at the end of the project. The underspent funds were directed to the event, resources and AST time budgets. The extra funds directed to events and resources were

[1] Please refer to the budget in your grant agreement

used to improve provision in these areas (e.g. enabling us to run a Maths Conference with multiple speakers as opposed to a one speaker event; the purchase of resources for use in training). The extra funds directed to the AST time budget were used to provide additional support and communication to teachers who had missed CPD sessions, to ensure they were fully abreast of key training and messages. Some year 1 schools also asked for further support in year 2, so additional AST time was allocated for this purpose to help the schools maintain the project's momentum in year 2. The additional funding (£10,000) was granted midway through year 1 once the level of data collation and analysis required for the interim and final reports became clear.

6. Project Outputs

Please use the following table to report against agreed output indicators, these should be the same outputs that were agreed in schedule 3 of your Funding Agreement and those that were outlined in your evaluation framework.

Table 4 – Outputs

Description	Original Target Outputs	Revised Target Outputs *[Original + any Additional Funding/GLA agreed reduction]*	Actual Outputs	Variance [Revised Target - Actual]
No. of schools	24	N/A	23	-1
No. of teachers - participating	24	N/A	24	0
No. of pupils – **more able group**	240	N/A	302	+62
No of pupils – total **directly impacted** by project	N/A (Only more able pupils were specified as a target output in the original funding agreement)	N/A	720 (This shows the number of pupils impacted by the 24 teachers trained)	+720
No. of teachers – receiving training	300	N/A	300	0
No of pupils – total **potentially impacted** by project (i.e. due to training)	1800	N/A	11,000 (This figure now includes all pupils in the 300 classes of teachers trained)	+9,200

7. Key Beneficiary Data

7.1 Teacher Sub-Groups (teachers directly benefitting counted once during the project)

Please provide your definition for number of benefitting teachers and when this was collected below.

The definition for **"benefitting teachers"** is **those who received intensive input and support while participating in all aspects of the project (i.e. CPD days, outreach support, self-directed study days).** It does not refer to teachers who only attended the whole staff CPD events.

In addition to the intensive CPD training provided to the benefitting teachers, the project has delivered CPD training to all teachers in each participating school, via whole staff CPD events. The vast majority of these other teachers did not receive any one-to-one or outreach support. Pupils in these classes only benefitted from the project intervention indirectly and the level of impact was dependent on: whether individual teachers chose to implement suggested strategies or not; how effectively the strategies were used by other teachers. The degree to which strategies were used and the quality of implementation was not monitored by the project beyond informal feedback and discussion with benefitting teachers. Therefore, the project was unable to measure impact at this level and so data for these pupils is **not included**.

Table 5 – Teachers benefitting from the programme

	No. teachers	**% NQTs** ***(in their 1st year of teaching when they became involved)***	**% Teaching 2 – 3 yrs** ***(in their 2nd and 3rd years of teaching when they became involved)***	**% Teaching 4 yrs +** ***(teaching over 4 years when they became involved)***	**% Primary (KS1 & 2)**	**% Secondary (KS3 - 5)**
Project Total	*24*	*8%*	*21%*	*71%*	*92%*	*8%*
Year 1	8	25%	25%	50%	100%	0%
Year 2	16	0%	25%	75%	87.5%	12.5%

7.1.2 Please provide written commentary on teacher sub-groups e.g. how this compares to the wider school context or benchmark.

How the teacher sub-groups compare to borough or national figures is not known, since the figures for borough and national sub-groups could not be obtained. However, there was a good mix of experience among the teachers in year 1, with benefitting teachers ranging in experience from two NQTs to a teaching deputy head and another teacher with 24 years teaching experience. In year 2, the majority of teachers had 4 of more years teaching experience and none of the teachers were NQTs. The experience of the year 2 teachers ranged from 3 to 18 years (average experience = 9 years; median = 8 years). It could be assumed that the year 2 cohort of teachers is less representative of the teaching population, due to the lack of NQTs and limited number (4 out of 16) of teachers in their first 3 years teaching.

7.2 Pupil Sub-Groups (these should be pupils who directly benefit from teachers trained)

Please provide your definition for number of benefitting pupils and when this data was collected below.

"Benefitting pupils" are defined as:

The **"More Able Group" (MAG)** consists of those pupils selected by their individual class teachers as the target group. They are a small sub-group within the project total group (see below). Pupils for this group were selected based on two criteria: those pupils whose prior levels of attainment were considered "high" and those pupils who the teachers felt had the potential to be higher attainers. No specific definition of "high" was stipulated as this was considered too restrictive and might have resulted in pupils who could have been selected for this group being excluded. Generally, "high" prior attainers in year 6 were those at level 5c and above and in year 5 it was pupils who were level 4b and above (as these levels are well above age related expectations). However, pupils at lower levels were included at teachers' discretion. Once pupils were attributed to the MAG, they remained in that group for measuring purposes throughout the project to gain an accurate measure of the project's impact on assessment levels.

The "**Project Total**" consists of all pupils in the classes of the teachers participating in the project, who were directly impacted by the project intervention.
A third group of pupils benefitted from teachers trained (**"Pupils Indirectly Impacted"**), although as stated above, the impact of the project on these pupils was not measured beyond anecdotal evidence.

In the tables below, any sub-group information that had a noticeable difference between the total pupil group and the MAG has been highlighted in red.

Tables 6-8 – Pupil Sub-Groups benefitting from the programme

	No. pupils	% LAC	% FSM	% FSM last 6 yrs	% EAL	% SEN
Project Total	*550**	*0.3%*	*14%*	*15%*	*19%*	*10%*
MAG	*242*	*0%*	*10%*	*10%*	*23%*	*2%*

* Some schools did not submit their data, meaning data for 60 pupils cannot be included. Therefore the totals shown and the percentages have been calculated based on the data received.

	No. Male pupils	No. Female pupils	% Lower attaining	% Middle attaining	% Higher attaining
Project Total	*281*	*269*	*19% **	*31% **	*50% **
MAG	*136*	*106*	*2% #*	*22% #*	*76% #*

* Assessment data for 19 of the 550 children was unavailable meaning their status as lower, middle or higher attaining pupils could not be measured prior to the project. Therefore, these pupils were excluded from the "attaining" columns above, meaning the total number of pupils was 531.
# Assessment data for 1 pupil of the 242 MAG total was unavailable. Percentages were calculated based on a total of 241 pupils.

	% Asian Indian	% Asian Pakistani	% Asian Bangladeshi	% Asian Any Other background	% Black Caribbean	% Black African	% Black Any Other Background	% Mixed White & Black Caribbean	% Mixed White & Black African	% Mixed White & Asian	% Mixed Any Other Background	% Chinese	% Any other ethnic group
Project Total	*7*	*1*	*0.2*	*5*	*8*	*6*	*2*	*3*	*0.4*	*1.5*	*2*	*0.4*	*1.5*
MAG	*10*	*2*	*0.4*	*10*	*7*	*4*	*2*	*2*	*0.4*	*0.8*	*1*	*0.8*	*1.2*
Croydon (2013-2014)	4	3	0.7	4	9	12	2	4	1.4	1.5	4	0.4	1.7
National (2013-2014)	2	3	1.4	1.4	1	3	0.5	1	0.5	1	1.5	0.3	2

	% White British	% White Irish	% White Traveller of Irish heritage	% White Gypsy/Roma	% White Any Other Background	Unknown *
Project Total	*45*	*0.1*	*0*	*0*	*5*	*12*
MAG	*45*	*0.4*	*0*	*0*	*5*	*8*
Croydon (2013-2014)	24	0.3	-	-	6	-
National (2013-2014)	55	0.2	-	-	4	-

NOTE: Due to rounding, the total when added may not show exactly 100%.
* The “Unknown” group schools includes pupils whose ethnicity was either unknown or refused. This was a large number of pupils and as a result this may have skewed the percentages for all other ethnicity groups.

7.2.1 Please provide a written commentary on your pupil data e.g. a comparison between the targeted groups and school level data, borough average and London average.

Table 6

- The proportion of pupils receiving FSM was slightly higher in the total group (14%) than the MAG (10%).
- The proportion of pupils receiving FSM in the last 6 years was slightly higher in the total group (15%) than the MAG (10%).
- The proportion of pupils with EAL was slightly higher in the MAG (23%) than the total group (19%).
- The proportion of pupils with SEN was higher in the total group (10%) than the MAG (2%).

Table 7

- The proportion of lower attaining pupils was higher in the total group (19%) than the MAG (2%). The proportion of middle attaining pupils was higher in the total group (31%) than the MAG (22%). The proportion of higher attaining pupils was higher in

the MAG (76%) than the total group (50%). This is not surprising since the MAG consisted of the higher attaining pupils.
The MAG was expected to contain a higher proportion of higher attaining pupils due to the criteria for selecting pupils for this group.

Table 8

- A greater proportion of the MAG (23.2%) were of Asian extraction compared to the total group (14.7%). This is the group where there is the greatest difference in proportions between the total group and the MAG. The proportion of pupils of Asian extraction for the total group was similar to the proportion in the borough of Croydon (13.2%), but higher than national levels (8.8%). The proportion of Asian pupils in the MAG was far higher than borough and national levels.
- A smaller proportion of the MAG (15.4%) were of black extraction compared to the total group (19.4%). These figures are lower than the proportion in the borough of Croydon (28.4%), but higher than national levels (6%).
- The proportion of pupils of white extraction was almost identical for the total group (55%) and the MAG (53.6%) These figures are higher than the proportion in the borough of Croydon (37.2%), but lower than national levels (61.7%).
- The proportion of pupils of mixed background was almost identical for the total (6.9%) and the MAG (7.8%). The proportion of pupils of mixed background is slightly lower than the proportion in the borough of Croydon (10.9%), but higher than national levels (4%).

8. Project Impact

You should reflect on the project's performance and impact and use **qualitative and quantitative** data to illustrate this.

At the outset of the project, schools were informed that they would be required to submit their current and trend data as a requirement for participation. Schools were aware that data collected (about pupils and teachers) was going to be analysed and reported as part of a final (and interim) reporting process and agreed to this in advance of data being used, although the exact format of the report could not be shared in advance since the required format was no known. The project lead decided not to use a formal agreement to communicate this as it might appear distant or off-putting. Instead, the project lead built strong, personal relationships with school leaders to reassure them about data security and confidentiality and addressed any concerns at a personal level with individual schools, which was deemed more conducive to developing strong, effective partnership working. Schools were informed of how the data would be kept secure and confidential (i.e. stored on an encrypted USB drive, files would be password protected and only accessed by the project lead). Schools were assured that all data used for reporting would be anonymised and no individual schools, teachers or pupils would be identified or identifiable. Schools were offered the option to remove pupil names from the data and instead use initials or generic names (e.g. "Pupil1, Pupil2, etc). Teacher surveys were anonymised using a numbering system and the document that associated teachers to their personal number was kept in a separate file. No schools refused to submit data, but some schools did not have the capacity to submit a complete set of data. All schools leaders and teachers had an open invitation to discuss the data and how it would be used at any time, via phone call, email or personal meeting, with the project lead.

8.1 Teacher Outcomes

Date teacher intervention started and completed:

- **12th November 2013 – 9th June 2014 (Year 1 cohort of schools)**
- **23rd September 2014 – 16th June 2015 (Year 2 cohort of schools)**

The teachers received a self-assessment survey on the intervention start date and the same follow up self-assessment on the intervention completion date.

Table 9 – Teacher Outcomes: teachers benefitting from the project

NOTES:

- The teachers received a self-assessment survey on the intervention start date and the same follow up self-assessment on the intervention completion date (*see above* for these dates for years 1 and 2).
- Headteachers for each of the 24 participating teachers were asked to provide an assessment of the quality of mathematics teaching before and after the intervention.
- A two-tailed T-Test was carried out on all the data in table 9.
- To maximise response rates, teachers were asked to complete pre- and post-intervention surveys at the first and final CPD days respectively. Any teacher who could not attend either day was emailed the survey and asked to return it to the project lead. While all teachers completed at least one of the surveys, 3 of the teachers did not complete either the pre- or post- intervention survey meaning their responses could not be compared and were thus not used for data analysis purposes. Their qualitative feedback was included.
- For the headteacher judgements ("Delivery of Higher Quality Teaching" outcome) a series of questions was emailed to each headteacher about their participating

teacher, including an overall judgement of the quality of Maths teaching, pre- and post- intervention. The email was followed up with a phone call and personal meeting to discuss any concerns and how the information would be kept confidential and anonymised for reporting purposes. Despite the strict protocol with which data would be kept and reported and the personal contact made with each head, some chose not to submit this information about their teachers as they deemed it too personal. In some cases teachers were relatively new to their schools, so headteachers had not been able to judge their Maths teaching pre-intervention, so a comparison could not be made and their data was not used.

Target Outcome	Research method/ data collection	Sample characteristics	Metric used	1st Return and date of collection	2nd Return and date of collection
Increased teacher confidence	Self-assessment survey. The survey was designed for use in this project. (See Appendix 3)	21 of the 24 teachers responded. Of the 3 teachers for whom no data is available, two were the secondary teachers.	Mean score based on a scale of 1-5, where 1 is high and 5 is low.	Mean score: **2.43**	Mean score: **1.33** (p value: **0.00000061)**
				Collected: on intervention start date	Collected: on intervention completion date
Delivery of higher quality teaching	3rd party (headteacher) judgement of the quality of teaching.	Data was received for 15 of the 24 teachers.	Mean score based on a scale of 1-4, where 1 is high and 4 is low. 1 equates to a rating of "outstanding"; 2 = "good"; 3 = "requires improvement"; 4 = "inadequate"	Mean score: **1.79**	Mean score: **1.32** (p value: **0.0022**)
				Collected: on intervention start date	Collected: on intervention completion date
Use of better subject specific resources	Self-assessment survey. The survey was designed for use in this project.	21 of the 24 teachers responded. Of the 3 teachers for whom no data is available, two were the secondary teachers.	Mean score based on a scale of 1-5, where 1 is high and 5 is low.	Mean score: **2.86**	Mean score: **1.29** (p value: **0.00000018**)
				Collected: on intervention start date	Collected: on intervention completion date
Improved subject specific knowledge and understanding	Self-assessment survey. The survey was designed for use in this project.	21 of the 24 teachers responded. Of the 3 teachers for whom no data is available, two were the secondary teachers.	Mean score based on a scale of 1-5, where 1 is high and 5 is low.	Mean score: **2.79**	Mean score: **1.48** (p value: **0.000014**)
				Collected: on intervention start date	Collected: on intervention completion date

Table 10 – Comparison data outcomes for Teachers *[if available]*

The project did not have a comparison group of teachers.

Target Outcome	Research method/ data collection	Sample characteristics	Metric used	1st Return and date of collection	2nd Return and date of collection
N/A	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*

8.1.1 Please provide information (for both the intervention group and comparison group where you have one) on:

- Sample size, sampling method, and whether the sample was representative or not
- Commentary on teacher impact (please also refer to table 5 re impact on different groups of teachers)
- Qualitative data to support quantitative evidence
- Projects can also provide additional appendices where appropriate.

- All teachers who participated in the project were given a pre- and post-intervention self-assessment survey. The survey was designed specifically for use in the project. The questions were directly relevant to the teacher target outcomes. In addition to responding to a numerical scale, the teachers were also able to offer a qualitative response to each of the questions. Some teachers only provided a pre- or post-intervention survey, so a comparison of pre- and post- scores was not possible, therefore their data was excluded from the overall figures. The sample of 21 teachers, who responded to the self-assessment, was representative of the overall group, although no data was received for the secondary teachers, so this group (2 teachers) was not measured. Despite the wide variation in experience, there was not a vast difference in the self-assessment scores for teachers based on their experience levels (i.e. NQTs and teachers with fewer years' experience did not necessarily score lower than more experienced teachers). The average of the mean scores on the pre-intervention self-assessment survey for the group of teachers with 0-3 years prior experience was 18.2, whereas for the teachers with 4+ years experience the average score was 15.2. Post intervention results showed that the average score for the teachers with 0-3 years prior experience improved to 8.0, whereas the average for teachers with 4+ years prior experience improved to 8.56.
- Headteachers from all project schools were asked to submit a judgement of the teaching quality in Maths for the benefitting teacher from their school, before and after intervention. Similarly, the scores for quality of teaching, were not noticeably different despite the wide variation in experience. Equally there was no difference in the improvement of teachers based on their levels of experience (e.g. NQTs benefitting more from the interventions than very experienced teachers) . Pre-intervention, the less experienced teachers (0-3 years prior experience) scored an average of 2.0 compared to more experienced (4+ years experience) teachers who averaged 1.7. Post-intervention results for less experienced teachers improved to an average of 1.125, compared to an improved average score of 1.3 for more experienced teachers. All the teachers scored 2.00 ("good") or higher ("outstanding") for teaching quality before intervention, although this is not surprising since teaching in schools is expected to be good or outstanding. All teachers who were not graded as 1.00 (i.e. "outstanding") prior to intervention showed an improved score for

teaching quality post intervention. One teacher's score lowered from 1.50 pre-intervention to 1.00 post-intervention, although this may be a result of a headteacher change in the year and therefore may not be a reliable comparison.

- The results of the teacher self-assessment survey and the headteacher judgements of teaching quality show that there was: a significant increase in teacher confidence; a significant improvement in the quality of teaching; a significant improvement in the use of subject specific resources; and a significant improvement in teachers' subject specific knowledge. All teachers showed an improvement in all areas measured by the self-evaluation questionnaire taken pre- and post-intervention. The qualitative feedback confirms the data findings, which means it is highly unlikely that the differences teacher in outcomes were due to chance. Since 21 teachers responded to the self-assessment survey and each survey measured teachers' responses to 6 areas, there were 126 possible scores in each of the pre and post-intervention surveys. Pre-intervention, only 12 instances of a response of 1.00 (i.e. "strongly agree", the most positive response) were received amongst all 21 teachers. This amounted to less than 10% of all responses. In the post-intervention survey, out of a possible total of 126 responses, 77 instances of a response of 1.00 were received (61% of all possible responses).
- In addition to the survey results, teachers have reported through qualitative feedback: an improvement in their subject knowledge; increased confidence; an improved ability to challenge and extend all their pupils, including the more able pupils; and improved use of assessment to foster more rapid progress.
- Teachers have access to a wider range of resources that enable them to challenge and extend the learning of their pupils. Teachers are now beginning to explore how to adapt and create their own resources. The survey showed that before intervention, on average teachers' scored lowest for subject specific resources (2.86) compared to pre-intervention scores for confidence (2.43) and knowledge (2.79), whereas after the intervention, the average score for resources was higher (1.29) than scores for confidence (1.33) and knowledge (1.48). The scores for subject specific resources improved most during the intervention and changed from being teachers' lowest scoring area to their highest scoring area.
- Overall, headteachers fed back that: the teaching of benefitting teachers is now consistently outstanding and colleagues are seeking their advice – the benefitting teachers are leading this area of learning in their schools. Two (year 1) schools received visits from OFSTED during the intervention. In one school, OFSTED highlighted the progress of the more able children as a strength, which the head teacher attributed to the work the teacher has undertaken as a result of the project's intervention. The second OFSTED visit verified the head teacher's judgement that the teacher's Maths (and other) teaching is now consistently outstanding.
- The t-test analyses show that all the improvements evident in teacher outcomes are significant at the 1% level.
- A summary of all the qualitative feedback obtained from all teachers who responded about the project's impact on their confidence and pedagogy can be found in appendix 1. Feedback from the teachers who participated in year 1 was sought at the end of year 2 (i.e. one year on) via email, but only one teacher chose to respond. A summary of feedback obtained from all headteachers who responded can be found in appendix 2. A sample of the comments are listed below.
- All feedback about how the project could have been improved (from either the teachers or the headteachers) has been included in section 12 (Final Report Conclusion).

  - The project has provided the teacher with a greater knowledge and understanding about how to deepen children's knowledge and application of

mathematical skills. There is a greater emphasis on reasoning in the classroom and this is evident in lesson observations, book scrutiny and discussions with pupils.

- Our teacher has a better understanding of how to challenge children in different ways, in particular how to develop children's abilities to explain their thinking and reasoning and question their own work. [The teacher's] use of questioning to extend her more able students has improved greatly during her time working on the project; students are required to think and work independently in her classes and this is reflected in their class work and assessment results. Lessons are increasingly student-led and student-focussed and students at the top end have consistently made progress throughout the year. (Secondary school)
- [The teacher] is outstanding in terms of challenging more able pupils in maths lessons. [The teacher's] maths (and other) teaching is now consistently outstanding, as verified by **OFSTED** in May '14. [The teacher's] subject knowledge in terms of high L5 and L6 maths has improved.
- There is evidence in her lesson observations that her ability to accelerate the progress of target groups in her class improved during the year.
- The project has provided the teacher with a greater knowledge and understanding about how to deepen children's knowledge and application of mathematical skills. There is a greater emphasis on reasoning in the classroom and this is evident in lesson observations, book scrutiny and discussions with pupils.

8.2 Pupil Outcomes

Date teacher intervention started and completed:

- **12th November 2013 – 9th June 2014 (Year 1 cohort of schools)**
- **23rd September 2014 – 16th June 2015 (Year 2 cohort of schools)**

Pupil outcomes were being measured in terms of **progress** and **attainment**.

Table 11 – Pupil Outcomes for pupils benefitting from the project

The 1st Return will either be your baseline data collected before the start of your project, or may be historical trend data for the intervention group. Please specify what the data relates to.

Target Outcome	Research method/ data collection	Sample characteristics	Metric used	1st Return and date of collection	2nd Return and date of collection
Increased pupil educational attainment and progress in Maths	Pupil assessment data	Assessment data was collected for 550 pupils directly impacted by the project : Project Year 1 consisted of 199 Year 6 pupils.	National Curriculum levels for MA2	Baseline data collected at start of relevant academic year.	Final assessment data submitted at the end of the relevant academic year.

		Project year 2 consisted of 167 year 5 pupils and 184 year 6 pupils.			

Table 12 - Pupil Outcomes for pupil comparison groups *[if available]*

Target Outcome	Research method/ data collection	Sample characteristics	*Metric used*	1st Return and date of collection	2nd Return and date of collection
Increased pupil educational attainment and progress in Maths	Pupil assessment data	Historical assessment data was collected for 1,795 former year 6 pupils who had been taught at the project schools prior to the intervention. The historical data was taken from the previous three year 6 cohorts at each school.	National Curriculum levels for MA2	Baseline data from the start of each academic year.	Final assessment data from each academic year.

Progress Summary:

The tables below shows the average rate of progress of pupils in each academic year.

- Each whole integer equates to one sub-level progress (e.g. 3c-3b = progress rate of 1.00).
- Using this numerical system, the nationally expected rate of progress is for all pupils to make at least 1.5 sub-levels progress per academic year.
- Data for the historical comparison group shows the average progress made by all pupils from the comparison groups in a specific academic year (i.e. progress made by all historical pupil groups during year 3, year 4 etc). The historical data was taken from cohorts of pupils that completed their primary education in one of the participating schools, in either: 2011, 2012, 2013 or 2014.
- The project year 1 and project year 2 cohorts consisted of different pupils.
- For the P1 and P2 data sets, the data in the year 3, 4 and 5 columns show the average progress made by the benefitting pupils in the years prior to intervention – this is useful to gauge the progress of the same pupils in previous years.
- More able pupils for the project groups were identified by the class teachers based on the pupils' prior academic attainment and their potential to achieve high attainment.
- The more able pupils in the historical group were identified by their attainment at the end of year 5 (level 4a and above). This is because the majority of the benefitting

pupils were in year 6 and were selected based on their attainment levels at the end of year 5.

- One of the main issues with confidence in the data for year 5 pupils taking part in year 2 of the project is that some schools had already stopped using National Curriculum (NC) levels for assessment (Note: year 6 pupils taking part in year 2 were continuing to use the old NC levels as stipulated by the DfE). Teachers were asked to measure pupils using the old NC levelling system for the purposes of consistency and comparison on the project, which they all agreed to do. While, we cannot be absolutely certain that the levels were an entirely accurate reflection of pupil attainment, the teachers were familiar with the NC levelling system and given the fairly broad nature of the levels we can be fairly confident in their ability to judge pupils' attainment using this system.
- Moderation of levels was conducted in year 1 by all participating teachers. Samples of pupils' learning from each class were brought to the third CPD day and a detailed evaluation of each pupils learning and each teacher's judgement was made to ensure consistency amongst the group. This exercise was valuable in confirming that all the teachers were making the same judgements of what was expected at each level.
- Results for benefitting pupils are highlighted in yellow.

Progress of benefitting pupils:

- Pupils benefitted from the project in year 6

		Progress made during the Academic Year			
	Group	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Project year 1 (P1)	Benefitting pupils (All)	1.60	1.61	1.73	**2.36**
Project year 2 (P2)	Benefitting pupils (All)	1.53	1.84	1.63	**2.37**
Historical	All pupils	1.49	1.63	1.71	2.03
Project year 1 (P1)	Benefitting Pupils (MAG)	1.96	2.12	1.96	**3.15**
Project year 2 (P2)	Benefitting Pupils (MAG)	1.69	2.10	1.85	**2.92**
Historical	MAG	1.78	1.99	2.26	1.76

Results for ALL pupils show that:

- The rate of progress generally increases each year as pupils move from years 3-6 (with the exception of P2 year 4).
- The average annual progress made by both the project cohorts and the historical groups between years 2 and 5 was approximately 1.6 sub-levels (1.65 for the project cohorts and 1.61 for the historical groups). This progress was slightly above nationally expected progress levels (1.5).
- Both the project cohorts and the historical groups showed a larger increase in progress during year 6.
- There was minimal difference in rate of progress made by the benefitting pupils compared to the historical groups during the year 3, 4 and 5 academic years. The benefitting pupils made greater progress than the historical comparison groups in year 6 – the year of intervention. This indicates that the benefitting pupils had previously made progress in line with similar, historical cohorts at their schools during the same academic years. The data for P2 Year 4 (1.84) is an exception to this general rule.
- The largest difference in rate of progress between the project cohorts (2.37 & 2.36) and historical groups (2.03) was made in year 6, which was the year of the project intervention. In year 6 benefitting pupils in P1 (2.37) and P2 (2.36) made similar rates of progress.
- During year 6 the project cohorts made 0.76 more sub-levels progress (2.36) than the average progress they had made during the 3 previous academic years (1.65).
- The project cohorts made on average 0.86 sub-levels more progress in year 6 than the nationally expected rate of progress. Historical groups had previously exceeded nationally expected rates of progress on average by 0.52 sub-levels.

Results for More able Pupils:

- Progress made by the more able pupils in the project cohorts, in the years prior to intervention, varied considerably (ranging from 1.69 to 2.12), especially for the P2 cohort.

- When progress across years 3-5 is averaged out, the project cohorts and the historical groups made on average 2 sub-levels progress per academic year: 1.95 for P1 and P2 combined, compared to 2.01 sub-levels for the historical groups. This indicates that despite annual fluctuations, the project cohort had made progress at a similar rate to the historical groups.
- The largest difference in rate of progress of more able pupils between the project cohorts and historical groups was made in Year 6, which was the year of the project intervention. During year 6, the more able pupils in the project cohorts made on average 1.25 sub-levels more progress (3.01) than the more able pupils from the historical groups (1.76).
- The more able benefitting pupils made just over 1.00 more sub-levels progress during year 6 (3.01) compared to the average progress they made (1.95) during the three previous academic years (i.e. years 3 – 5).
- The more able pupils in the project cohort made on average 1.5 sub-levels more progress in year 6 than the nationally expected rate of progress (which is double the expected rate of progress). Historical groups had previously exceeded nationally expected rates of progress by an average of 0.44 sub-levels.

This table shows the **progress made by the ALL pupils** in year 6, by sub-group:

- Results for benefitting pupils are highlighted in yellow.
- To highlight the difference in average progress for the sub-groups when comparing the benefitting pupils to historical groups, the higher rate of progress is in bold.

Sub-Group	Number of pupils		Progress in Year 6	
	Benefitting pupils	**Historical Groups**	**Benefitting pupils**	**Historical Groups**
Boys	281	843	**2.34**	2.07
Girls	269	830	**2.38**	2.09
SEN / Statemented	38	237	1.71	**1.84**
LAC	2	4	**3.50**	1.25
Free School Meal (FSM)	53	172	**2.28**	1.95
Ever 6	64	180	**2.22**	1.99
EAL	77	225	**2.35**	2.06

Results for All Pupils by Sub-Group:

- The progress of benefitting pupils in all the sub-groups was in line with the progress made by all benefitting pupils (2.36). The exception to this is the SEN/Statemented group who made less progress (1.71) than the average.
- When progress for all pupils was examined, the sub-groups in the project cohorts made greater progress than pupils than the equivalent sub-groups from the historical groups, except those pupils with a statement or SEN.
- When examined more closely, the data for the SEN/Statemented group contained 6 pupils who had zero or negative progress. The reasons for the lack of or reversed progress are not known, but suggest there are other factors that are contributing to the data that has been reported. If data for these 6 pupils is excluded from calculations, the average progress for the SEN/Statemented benefitting pupils is 2.33, which is in line with other sub-groups and the average for all benefitting pupils (2.36).
- The small size of some of the groups made it difficult to test the significance of these results.

This table shows the **progress made by more able pupils** in year 6:

- Results for benefitting pupils are highlighted in yellow.
- To highlight the difference in average progress for the sub-groups when comparing the benefitting pupils to historical groups, the higher rate of progress is in bold.

Sub-Group	Number of pupils		Progress in Year 6	
	Project	Historical	Project	Historical
Boys	77	358	**2.96**	2.06
Girls	56	326	**3.11**	2.03
SEN / Statemented	0	25	N/A	1.88
LAC	0	1	N/A	2.00
Free School Meal (FSM)	15	35	**2.93**	1.83
Ever 6	17	54	**3.00**	2.00
EAL	34	131	**2.65**	2.00

Results for the More Able Group by Sub-Group:

- For all sub-groups, the average progress of the benefitting pupils was higher than the historical groups.
- All sub-groups made approximately 1.00 sub-level more progress than the equivalent historical group, with the exception of the EAL group, for which the benefitting pupils made 0.65 sub-levels more progress than the equivalent historical group.
- The progress made by more able boys, girls, FSM and Ever 6 pupils was around double the nationally expected rate of progress.
- The progress of the more able pupils from all the sub-groups, except EAL pupils, from the project cohorts was in-line with the progress of all more able pupils in the project cohorts (3.01)
- The number of pupils in these groups was very small and therefore a test to ascertain the statistical significance of the results could not be performed.

Attainment

The table below shows pupils' attainment in year 6:

- The "Project Schools 2014" and "Project Schools 2015" rows show data for the benefitting pupils (highlighted yellow). All other "Project Schools" rows show data for historical groups at the project schools.
- Borough and national data for 2015 results was not available for comparison.

		Pupils @ level 6	***Pupils @ level 5***	***Pupils ≥ level 5***
Summary of data for year two of the project intervention (2014-2015)	***Project Schools 2015* (Year 2)***	***22%***	***30%***	***52%***
Summary of data for year one of the project intervention (2013-2014)	***Project Schools 2014* (Year 1)***	***21%***	***36%***	***57%***
	Croydon 2014	*11%*	*41%*	*52%*
	National 2014	*9%*	*42%*	*51%*
Summary of historical comparison data from previous years in the same schools.	*Project Schools 2013*	*9%*	*36%*	*45%*
	Croydon 2013	*8%*	*33%*	*41%*
	National 2013	*6%*	*35%*	*41%*
	Project Schools 2012	*4%*	*41%*	*45%*
	Croydon 2012	*5%*	*32%*	*37%*
	National 2012	*3%*	*36%*	*39%*
	Project Schools 2011	*6%*	*46%*	*52%*
	Croydon 2011	*N/A*	*N/A*	*34%*
	National 2011	*N/A*	*N/A*	*35%*

Attainment - Level 6:

- The project schools' historical groups had a similar percentage of pupils attaining level 6 in 2012 and 2013 when compared to borough (Croydon) and national figures.
- Compared to borough (Croydon) percentages, historical groups from project schools had 1% fewer level 6 pupils in 2012 and 1% more in 2013.
- Compared to national percentages, historical groups from project schools had 1% more level 6 pupils in 2012 and 3% more in 2013.
- In 2014 (year 1) 21% of benefitting pupils attained level 6. This was 10% and 12% higher than Croydon and national results respectively. Compared to the borough and national results in 2014, around double the percentage of benefitting pupils attained level 6.
- In 2015 (year 2) 22% of benefitting pupils attained level 6. This was 11% and 13% higher than Croydon and national results for 2014 (2015 borough and national data was unavailable for comparison).
- Each year the percentage of pupils who attained level 6 increased by 3% at national (national: 2012 = 3%, 2013 = 6%, 2014 = 9%) and borough (Croydon: 2012 = 5%, 2013 = 8%, 2014 = 11%) levels. The results for the project schools were slightly higher than this rate of increase (2012 = 4%, 2013 = 9%), until 2014 and 2015 when the results for benefitting pupils increased by 12% and 13% respectively compared to historical groups in 2013.
- The percentage of benefitting pupils attaining level 6 was consistent in both project years (21% in 2014 and 22% in 2015).

Attainment - Level 5 & Above:

- In 2014, the percentage of pupils attaining level 5 or above was higher than the previous highest mark for the project schools (52% in 2011).

- The percentage of pupils attaining level 5 or above at national and borough level steadily increased from 2011 to 2014. However, over the same period, results for the historical groups shows the inverse was happening and the percentage of level 5+ pupils had declined from 52% in 2011 to 45% in 2012 and 2013.
- Between 2013 and 2014 the percentage of pupils attaining level 5 or above in project schools increased by 12% from 45% to 57%.
- There was a slight decrease in the percentage of benefitting pupils attaining level 5+ from 2014 (57%) and 2015 (52%). This was due to a decrease in the percentage of benefitting pupils attaining level 5. It would be interesting to find out if there was any difference in outcomes at borough and national levels during over the same period.

The tables below shows the results of a series of two-tailed t-tests to ascertain the statistical significance of the results when comparing the progress and attainment for benefitting pupils compared to the results for the historical groups.

- Pink cells show results that are significant to a 1% level (p-value < 0.01)
- Blue cells show results that are significant to a 5% level (p-value < 0.05)

Table displaying comparison for **all benefitting pupils** (BP) against historical groups.

PROGRESS	**p-values**		**ATTAINMENT**	**p-values**
All BP compared against all historical groups	0.000320839		All BP compared against all historical groups	0.01030385838
All BP compared against 2014 historical group	0.000492435		All BP compared against 2014 historical group	0.38341302804
All BP compared against 2013 historical group	0.000174159		All BP compared against 2013 historical group	0.01772453188
All BP compared against 2012 historical group	0.000000601		All BP compared against 2012 historical group	0.00025393923
All BP compared against 2011 historical group	0.001175300		All BP compared against 2011 historical group	0.02666267148

Table displaying comparison for **more able pupils** against historical groups.

PROGRESS	**p-values**		**ATTAINMENT**	**p-values**
MAG compared against all historical groups	0.0000000000009599		MAG compared against all historical groups	0.0000030565691
MAG compared against 2014 historical group	0.001090847		MAG compared against 2014 historical group	0.540398587
MAG compared against 2013 historical group	0.0000000000060413		MAG compared against 2013 historical group	0.0000458649089
MAG compared against 2012 historical group	0.0000000000000010		MAG BP compared against 2012 historical group	0.0000000029222
MAG compared against 2011 historical group	0.0000000000051768		MAG compared against 2011 historical group	0.0117370278870

The t-test analyses show that the majority of the increases seen in pupil progress and attainment are significantly different. The exceptions are:

- Comparing all benefitting pupils against the 2014 historical group.
- Comparing the more able group against the 2014 historical more able group.

8.2.1 Please provide information (for both the intervention group and comparison group where you have one) on:

- Sample size, sampling method, and whether the sample was representative or not
- Commentary on pupil impact (please also refer to table 6-8 re impact on different groups of pupils)
- Qualitative data to support quantitative evidence.
- Projects can also provide additional appendices where appropriate.

Assessment data for each benefitting pupil was gathered before and after the project intervention. Data for each benefitting pupil was gathered from the end of KS1 until the intervention to ascertain if changes in progress were different following intervention, compared to progress for the same pupils in previous years. For a variety of reasons, assessment data for some pupils was not available, hence why out of the total of 720 benefitting pupils, a complete set of data was only available for 550 pupils. Similarly, of the 302 pupils in the MAG, data was only available for 242 of them. Therefore, the overall data picture for benefitting pupils is not complete and it is not known how the data for missing pupils might affect the average and percentage calculations for the benefitting pupil group, or the MAG, as a whole. As described earlier, the ultimate aim was to secure data for all schools. To make data submission as simple as possible a template spreadsheet showing the required information in column headers was circulated to all schools at the start of each year. Data was required to be submitted at the end of each term. Schools were communicated with on a regular basis if they had any data missing or submitted incomplete data. Despite the attempts to create a simple system for data collation and submission, some schools did not submit complete sets of data.

Qualitative data summarising impact on pupils, including information taken from the pupils themselves, was collected from benefitting teachers and headteachers. Teachers collected feedback from pupils regularly throughout the intervention and recorded their findings in a lesson evaluation form. Pupil responses were regularly reviewed throughout the project, but have not been summarised due to the vast amount of information and the limited time to sift through and summarise their comments. This helped them track the changes in pupil attitudes, approach and progress in Maths over the year. A summary of the impact on pupils' learning and achievement can be found in appendices 1 and 2.

8.3 Wider System Outcomes

Table 13 – Wider System Outcomes

Target Outcome	Research method/ data collection	Sample characteristics	*Metric*	1st Return and date of collection	2nd Return and date of collection
Teachers/ schools involved in intervention making greater use	Qualitative feedback obtained from benefitting teachers and	All teachers and headteachers were asked to complete the survey.	Survey gauged: Impact of: intervention on benefitting teachers and	No pre-intervention survey was taken on the wider school	The survey was taken at the end of the project intervention

of networks, other schools and colleagues to improve subject knowledge and teaching practice	headteachers in a post intervention survey		the wider teaching community in each school; Impact of the whole staff CPD on teaching & learning in Maths	quality of Maths provision.	

8.3.1 Please provide information on*:*

- Sample size, sampling method, and whether the sample was representative or not
- Commentary on wider system impact qualitative data to support quantitative evidence.
- Projects can also provide additional appendices where appropriate.

All 24 benefitting teachers completed a post-intervention survey. Headteachers from all 23 schools completed a post-intervention survey. The survey contained qualitative measures only. Quantitative measures of the wider school impact were not taken. The survey was a series of questions relating to the impact of the intervention on: benefitting teachers, benefitting pupils and teaching staff across the school.

A sample of comments made by head teachers in reviewing the effectiveness of the project are listed below. **The full summary of headteacher feedback can be found in appendix 2**.

- "It has also been clear that from observing other teachers that they have sought advice from [the benefitting teacher] as to what teaching strategies they could use to ensure that their pupils get the most out of maths lessons."
- "Across the school, teachers are beginning to implement these ideas. Where they have been particularly successful, data supports this."
- "The focus on this that the project has provided has had a very positive impact on the maths within the school."
- "This has had a significant impact on the teaching across the school."
- "We are taking what we have learnt from this to look at reading and writing challenge."
- "I would hope that this project would continue as its strength is not only its ability to support colleagues and parents alike but also to ensure that maths is enriching, challenging and fun for all children and that aspiration can lead to self-challenge amongst our pupils."

8.4 Impact Timelines

Please provide information on impact timelines:

- At what point during/after teacher CPD activity did you expect to see impact on teachers? Did this happen as expected?

CPD sessions organised and run by the project lead were designed to ensure benefitting teachers could apply strategies and resources immediately following the training. Teachers fed back that while they were able to use strategies and resources immediately after CPD, their confidence and skill in doing so took time to develop and refine. They indicated that as the intervention went on they became increasingly more familiar with

the changes to their pedagogy and were then able to adapt the practices to suit their individual settings and cohorts of pupils. While all benefitting teachers viewed the pedagogical changes positively, it was noticeable that individual teacher's commitment to applying the new strategies and resources varied. Although only anecdotal evidence exists for this, from observations made during outreach and examination of teacher feedback, it was evident that the more readily teachers adopted the suggested strategies, the more positive the impact on their practice and their pupils, according to teachers' feedback. Teachers who applied the strategies more gradually or less rigorously, noticed less impact in the classroom. Teachers felt that they would be more skilled at applying their increased confidence and subject pedagogy in the year following intervention and that there might well be more impact since they would be able to use their new practices at the start of the year and had a clearer idea of how to implement them. It was not possible to measure the impact of the project in the years post-intervention, but it bodes well that teachers felt more confident and able to develop their Maths pedagogy independently, without intervention support, and that they could do so with their colleagues for wider school impact. Following year 1, the project lead reflected on and refined the CPD sessions to increase the potential for immediate impact earlier in the academic year (i.e. introducing pedagogical strategies in CPD sessions at the start of the year as opposed to mid-year) and year 2 teachers fed back that this had helped implementation.

- At what point during/after teacher CPD activity did you expect to see impact on pupils? Did this happen as expected?

Since the intervention for benefitting teachers was designed for immediate impact, the impact on benefitting pupils also had potential for impact immediately post CPD, although, as expected, the improvements in pupil outcomes took place gradually, as pupils adapted to new teaching methods, learning expectations and different resources that required the development of different skills. Although not the case for every pupil, generally pupils found the changes initially challenging and some struggled to get to grips with an approach to Maths that required more problem solving and reasoning elements. Teachers reported that initially pupils lacked perseverance and the ability to think about problems flexibly and creatively. Often, the most able pupils were most challenged by the new approach and found it difficult to accept that they were not able to find solutions immediately. However, as time progressed and pupils adjusted their own expectations of what learning they would face and what was expected in terms of outcomes in lessons, teachers reported that pupil attitudes became more positive, engagement and interest increased and this was evident in their learning, ultimately having a positive impact on their progress and attainment.

- At what point did you expect to see wider school outcomes? Did this happen as expected?

Impact in the wider school setting was dependent on a number of factors, including: how confident benefitting teachers felt about applying and disseminating new practices; the timing of training to support teachers in disseminating practices (training in this regard was provided later on during the year once benefitting teachers had been given the opportunity to try out and refine the suggested strategies and resources); how smoothly the new practices could be dovetailed with existing practices in schools. Therefore, wider school impact was not anticipated until later in the year, or in the year following intervention. However, a number of schools fed back that strategies were beginning to be used more widely in their schools. This often started with one or two staff taking the benefitting teacher's lead, before other staff began to get involved. Discussion with

some year 1 schools 6 months post-intervention indicated that strategies had been used more widely and in some schools more generic pedagogical approaches had been used in other curriculum areas (e.g. English, Science etc).

- Reflect on any continuing impact anticipated.

It is hoped that following intervention, the benefitting teachers will continue to develop the strategies and resources advocated by the project in their own classrooms and in their schools more widely. Some schools have asked for continued support in this regard (e.g. with training for TAs and further work with parents). In most schools, the benefitting teachers have the confidence, knowledge and pedagogical skill to develop practices further without intervention support. Following intervention, a number of them have already taken on positions of responsibility (e.g. Maths coordinator roles) within their schools, which will enable them to continue work in this area.

9. Reflection on overall project impact

In this section we would like you to reflect on:

- The overall impact of your project
- The extent to which your theory of change proved accurate
- How your project has contributed to the overall aims of LSEF
- Whether your findings support the hypothesis of the LSEF
- What your findings say about the meta-evaluation theme that is most relevant to you (stretch in primary schools)

Please illustrate using the key points from the previous detailed analysis.

All the evidence should be brought together here (achievement of outputs and outcomes, and the assessment of project impact) to produce well informed findings, which can be used to inform policy development in a specific area as well as the meta-evaluation of the LSEF.

The London Schools Excellence Fund (LSEF) is based on the hypothesis that investing in teaching, subject knowledge and subject-specific teaching methods and pedagogy will lead to improved outcomes for pupils in terms of attainment, subject participation and aspiration.

The aims of the Fund:
I. Cultivate teaching excellence through investment in teaching and teachers so that attention is re-focused on knowledge-led teaching and curriculum.
II. Support self-sustaining school-to-school and peer-led activity, plus the creation of new resources and support for teachers, to raise achievement in priority subjects in primary and secondary schools (English, mathematics, biology, chemistry, computer science, physics, history, geography, languages).
III. Support the development of activity which has already been tested and has some evaluation (either internal or external), where further support is needed to develop the activity, take it to scale and undertake additional evaluation.
IV. In the longer term, create cultural change and raise expectations in the London school system, so that London is acknowledged as a centre of teaching excellence and its state schools are among the best in the world.

- The overall impact of your project

- The extent to which your theory of change proved accurate
- How your project has contributed to the overall aims of LSEF
- Whether your findings support the hypothesis of the LSEF
- What your findings say about the meta-evaluation theme that is most relevant to you.

Quantitative and qualitative analysis shows that the overall impact of the project has been very positive and the stated aims have been met. The project was true to the theory of change: the activities stated in the original project plan were carried out and the intended outcomes were achieved.

The project made a positive contribution to the overall aims of the LSEF, since its main focus was to *invest in teaching, subject knowledge and subject-specific teaching methods and pedagogy, which led to improved outcomes for pupils in terms of attainment, subject participation and aspiration*. A culture of *teaching excellence was created through investment in teaching and teachers, so that attention was focused on knowledge* ***and skill****-led teaching and curriculum* - the development of pupils' core skills (e.g. reflection, perseverance, communication etc) and Maths specific skills (e.g. problem solving and reasoning) was a vital component of the project's activities and its success. By empowering benefitting teachers to lead future developments (e.g. pedagogy and resource development, and CPD) in their schools, the project was able to *support self-sustaining and peer-led activity.* Through the development of teachers' pedagogy and a variety of factors that influence pupil outcomes, they deepened their understanding of how these can be used to *raise achievement in mathematics*. By using as its foundation a methodology that had been previously developed and applied in schools with success (i.e. an *evaluation* of quantitative and qualitative evidence demonstrated positive impact), the project was able to use the LSEF to *scale up* its activities and offer further developments in methodology and delivery, for the benefit of teachers, pupils and schools (e.g. embedding pedagogical developments in research; providing teachers with access to experts in the field of primary mathematics, providing teachers with new resources and giving teachers time for reflection on the effectiveness of their practice). If the *cultural changes* that formed a key aspect of the project were applied more widely by schools in London, they would *raise expectations* of pupils' potential achievements and support the aim for *London to be acknowledged as a centre of teaching excellence*. The project demonstrates how stretch and challenge can become part of everyday teaching in primary mathematics, which supports the meta-evaluation focus in this area.

The aims of the project were:
1. Increased teacher confidence.
2. Delivery of higher quality teaching including subject-focussed teaching methods in Maths.
3. Use of better subject-specific KS2 and KS3 Maths resources.
4. Increased pupil educational attainment and progress in Maths.
5. Teachers/schools involved in intervention making greater use of networks, other schools and colleagues to improve subject knowledge and teaching practice.

There was a significant increase in teacher confidence. As teacher confidence grew, they felt empowered to provide greater challenge to learners of all abilities, but especially the more able pupils, which was a group the teachers generally found difficult to stretch prior to intervention. In turn, teachers empowered their pupils by raising expectations of what they could achieve and encouraged them to take an increased responsibility for their learning, in conjunction with an increased requirement for pupils to be more reflective in terms of evaluating and developing their own mathematical thinking and skills. One of the key principals of the project's pedagogy development was that by empowering teachers with

more confidence and a deeper understanding of how to challenge pupils mathematically (including: use of high quality resources, an increased focus on the development of problem solving and reasoning skills, flexible approaches to lessons, the skilled use of questioning, and high quality formative assessment) they would be less reliant on schemes of work and rigid systems/approaches to the teaching and learning of Maths. Prior to intervention, teachers reported that they felt the need to closely manage pupils' learning. However, this had the adverse effect of limiting children's potential and attainment. The intervention developed teachers' pedagogy to give them the confidence to step back and allow pupils more control over their own learning, intervening only when necessary and using finely tuned pedagogical skills to do so. This meant their teaching had a greater and deeper impact on pupils' learning and achievement, as well as a positive impact on pupils' engagement and attitude to Maths. One of the strongest feedback messages from teachers was that by adapting their pedagogy in the suggested ways they had a much deeper understanding of their pupils as mathematicians, which enabled them to plan lessons more carefully, lead pupils through the learning objectives more skilfully (e.g. through the use of specific and challenging questioning) and assess pupils progress more precisely. In the post-intervention survey, teachers reported: an improvement in their subject knowledge; increased confidence; an improved ability to challenge and extend all their pupils, including the more able pupils; and improved use of assessment to foster more rapid progress. Furthermore, teachers now have access to a wider range of resources that enable them to challenge and extend the learning of their pupils. Teachers are now beginning to explore how to adapt and create their own resources. Overall, headteachers reported that the project positively impacted the quality of teaching in lessons (see appendix 2). During year 1, two schools received OFSTED inspections. In one school, OFSTED highlighted the progress of the more able children as a strength, which the head teacher attributed to the work the teacher has undertaken as a result of the project's intervention. The second OFSTED visit verified the head teacher's judgement that the teacher's Maths (and other) teaching is now consistently outstanding.

Data analysis shows that there was a significant improvement in pupil progress and attainment following intervention when compared to the progress and attainment of the pupils prior to intervention and when compared to a historical comparison group. The improvement was most marked in the more able pupils, although there was also an improvement in the progress and attainment of all pupils. A similar trend of improvement was evident in a variety of sub-groups. Qualitative feedback also showed that the project had a positive impact on pupils' attitude towards Maths, their engagement with the subject and in the development of transferable skills, such as problem solving and reasoning. Many teachers reported that pupils had developed their ability to explain their mathematical thinking both verbally and in writing.

Given the complex nature of pupil development and the myriad of factors that can contribute to and impact on a child's progress and attainment it is impossible to say for certain that the project intervention was the sole or even main cause of any improvements in the pupils' progress and attainment. Although anecdotal evidence does not indicate this, project schools or teachers may have been receiving support in this area via another intervention or CPD programme. Participating teachers may have had a pre-existing passion for or professional interest in Maths and therefore been more receptive to and inclined towards professional development in this area. Their starting points may also have been higher than their peers, which was not measured. Additionally, the pupils may have been receiving additional support either in or outside of school (e.g. tutoring) which could have had an impact on their development.

In summary: the project has had a highly positive impact on the participating schools, teachers and pupils, as evidenced by both qualitative and quantitative feedback. Outcomes reported so far are either in line with or have exceeded pre-project expectations. Teachers

have developed and refined their pedagogy and are more confident in their subject knowledge and ability to extend and challenge pupils of all abilities. Although the project's stated target group is more able pupils, the fact that the positive impact is evident in pupils of all abilities is one of the project's great strengths, since it has wide application and impact. Teachers report that pupils are more engaged with their Maths learning and are being given greater responsibility and freedom to demonstrate their understanding with increasing independence and through more complex and intricate problems. As a result, teachers have noted their pupils' growing confidence; appetite for Maths challenges; and a burgeoning ability to apply their mathematical knowledge and understanding to solve a variety of problems. End of year teacher assessment and SATs results have indicated the positive impact the project has had on pupil progress and attainment. Teacher and head teacher feedback indicates that the project intervention has played a significant part in the improvements in progress and attainment. Teachers are beginning to cascade their new, effective pedagogical practices to colleagues and have anecdotally reported this is having a positive impact in their schools, thus broadening the impact of the intervention.

A number of aspects of the project have worked well. One of the key elements has been the high quality CPD training and outreach support provided to teachers, which has enabled them to develop more effective practices, strategies and resources. One teacher fed back about the project training that, "This was by far the best day of CPD I have spent, including sessions run by the Institute of Education, Warwick Business School & London Borough of Croydon." The CPD sessions included how taking a more creative, flexible approach to planning and structuring lessons enables teachers to tailor lessons more precisely to target the needs of specific groups and individual pupils. A focus on developing questioning and formative assessment skills, as well as pupils' independence and ability to reflect on their learning and skills has further enhanced the experience of Maths for both teachers and pupils. Teachers report that they have been able to carry out more thorough assessments of their pupils and feel they can more accurately identify their areas of strength and development for future learning. The self-directed study days were an excellent way for teachers to reflect on and take responsibility for advancing their own professional development. The guest speaker events were crucial in reinforcing the project's key messages with staff, as well as engaging with parents and developing their understanding of effective mathematical teaching in a contemporary classroom.

10. *Value for Money*

A value for money assessment considers whether the project has brought about benefits at a reasonable cost. Section 5 brings together the information on cost of delivery which will be used in this section.

10.1 Apportionment of the costs across the activity

Please provide an estimate of the percentage of project activity and budget that was allocated to each of the broad activity areas below. Please include the time and costs associated with planning and evaluating those activity areas in your estimates.

Broad type of activity	**Estimated % project activity**	**£ Estimated cost, including in kind**
Producing/Disseminating Materials/Resources	21%	£17,799.70
Teacher CPD (face to face/online etc)	54%	£46,831.00
Events/Networks for Teachers & parents	7%	£6,249.30
Teacher 1:1 support	Included in "Teacher CPD"	Included in "Teacher CPD"

Events/Networks for Pupils	Time spent with pupils is included in "Teacher CPD" as this was part of the outreach element of the training.	Included in "Teacher CPD"
Data collation & analysis	12%	£10,000.00
Writing up & publishing findings	6%	£5,000.00
TOTAL *	**100%**	**£85,880.00**

Please provide some commentary reflecting on the balance of activity and costs incurred: Would more or less of some aspects have been better?

- More than half the time and budget allocated for the project was spent on CPD for teachers. This included: CPD training days and events; one-to-one support in school; supporting the development of teachers' pedagogical skills, with pupils, in the classroom; CPD support and advice via email and telephone; whole school staff training and events. There was a deliberately high level of project time and funds directed to this to maximise the potential impact of the project on the intended outcomes. Teachers were able to implement the strategies and use resources immediately after CPD sessions, which reinforced the development.
- More time for the one-to-one support in schools would have been beneficial, especially in the early stages of each intervention year as this would have supported staff with their understanding and implementation of strategies and resources.
- The CPD events for teachers and parents were well received. Guest speakers were specifically selected to reinforce the project's key aims and messages. Although it could be tempting to organise more of these events, the reality is that teachers and schools are always striving to develop their pedagogy in a number of ways and had there been more events, uptake may have been less and the impact of those events may have been diluted.

10.2 Commentary of value for money

Please provide some commentary reflecting on the project's overall cost based on the extent to which aims/objectives and targets were met. If possible, draw on insight into similar programmes to comment on whether the programme delivers better or worse value for money than alternatives.

- Given the degree to which the project aims were met and the considerable evidence of the positive impact the project had on teachers' pedagogy and pupils' learning, the project provided excellent value for money.
- Information on the impact and cost of other, similar projects was not readily available, so commentary on comparison with similar projects is not possible.

10.3 Value for money calculations

Note: This section is only required for projects with control or comparison groups

In order to demonstrate the cost effectiveness of the project we would like those projects who had control or comparison groups to provide some value for money calculations. Further guidance will be issued to support projects with this.

- Although this project used historical data as a comparison, it was not possible to perform the value for money calculations due to limitations of time and capacity.

11. Reflection on project delivery

This section is designed to allow for a discussion of wider issues relating to the project.

Please include reflection on the following:

11.1 Key Enablers and Barriers to Achievement

- *Were there internal and/or external factors which appear to have had an effect on project success, and how were these responded to (if applicable)?*
- *What factors need to be in place in order to improve teacher subject knowledge?*

The project was well organised by a lead with previous experience in project management (outside education) and running similar multi-school, development programmes. Effective working relationships with individual teachers and schools were established quickly and schools received regular communication throughout, to develop strong partnerships.

The project was designed in such a way so as to provide teachers with a balance of CPD sessions delivering core messages, as well as tailored outreach support. While the project did set out to challenge teachers' pre-existing perceptions about what excellent teaching and learning in Maths looked like, the fact that each individual teacher and school was supported in a way that was tailored to be congruent with their existing practices, ethos and values, meant schools could adopt strategies more readily. To develop teachers' subject knowledge and subject- specific pedagogy, it is essential that those providing CPD and practice development in schools must have an in-depth understanding of both subject content and what constitutes high quality pedagogical skills. For this project, high quality CPD training and outreach support was provided by an experienced Advanced Skills Teacher with a honed understanding of what constitutes excellent practice as well as expertise in how to support staff in the development of such practice.

The external, expert speakers provided CPD events for staff that reaffirmed the strategies and approach to Maths pedagogy being advocated by the project. This affirmation was reassuring for staff, especially school leaders, and encouraged greater commitment to adopting the project's strategies.

The success of the project in each school was dependent on how willing teachers and schools were to implement new strategies, methods and resources, and how committed they were when doing so. Anecdotal evidence suggests that the teachers and schools that embraced the new methodologies and practices seemed to benefit more than those who were less committed. Although schools joined the project voluntarily, the development priorities in each school were outside the project's control and these will have influenced the degree to which the project's aims aligned with the schools' development plans. Some schools may have had higher strategic priorities, which may have impacted their capacity for introducing further changes.

11.2 Management and Delivery Processes

- *How effective were the management and delivery processes used?*
- *Were there any innovative delivery mechanisms and what was the effect of those?*
- *Did the management or delivery mechanisms change during the lifetime of the project and what were the before or after effects?*

The starting point for the LSEF project was an action research project, funded by the London Borough of Croydon as part of its AST intervention programme, that had been run in the previous academic year (2012-2013) by the same project lead (who was also responsible for delivery of training and support to schools). Therefore, a similar model of organisation and delivery was used (i.e. a combination of CPD training sessions and outreach support). However, the LSEF funding enabled the existing programme to be enhanced. For example:

- The project lead was able to spend time ensuring the strategies were underpinned by current research;
- Further development of training materials and resources;
- Whole staff training was added to support the wider adoption of strategies in schools;
- The procurement of the services of expert speakers to deliver staff CPD and parent workshops;
- Schools were provided with funding to cover the costs of releasing staff to attend training making it more likely staff remained in the intervention programme;
- Benefitting teachers were provided with release time to reflect on and develop their pedagogy.

In addition, the project was scaled up from 6 schools/teachers during the pre-LSEF initial pilot project (2012-2013) to 8 schools/teachers in year 1 and again to 13 schools (14 teachers) in year 2. This scaling up enabled the project to impact a larger number of schools, teachers and pupils. The same full programme of support offered to year 1 schools was provided to all year 2 schools (i.e. the same number of CPD days, events and outreach visits), however providing support to 14 teachers in year 2 was probably the limit of the project's capacity (since the project was being led and delivered by one person).

The overall management and delivery of the project worked extremely well, as evidenced by feedback from teachers and headteachers. A number of the delivery strategies proved to be highly effective in securing the success of the project, including:

- The use of AST time to visit schools and provide tailored outreach support to model and reinforce how teachers could apply the new strategies and resources in their schools. This enable the AST to help the teachers fine tune their practice and address any misconceptions or challenges;
- Some of the time in the CPD sessions was set aside for benefitting teachers to suggest and manage the agenda, which empowered them to take control and responsibility for elements of their training.

The project seemed to use an innovative model for delivery through its combination of multiple CPD days, outreach support; regular email and telephone advice; expert speaker events; and whole staff training, since this is not a model commonly found offered in educational CPD.

Apart from some minor adjustments (e.g. the timing of events), the delivery model remained consistent throughout the project's two years. This is because feedback from benefiting teachers at the end of year 1 indicated that the project had provided a thorough and well-thought-through programme of training. The main feedback from teachers at the end of year 1 in relation to improvements in project delivery was for the programme to start earlier in the year, hence the earlier start date of the year 2 intervention. It should be noted that the start of the year 1 intervention programme was delayed until obligatory training from the GLA had been delivered, and not because the project was not ready for launch.

11.3 Future Sustainability and Forward Planning

- *Do you have any plans for the future sustainability of your projects?*
- *What factors or elements are essential for the sustainability of your project?*
- *How have you/will you share your project knowledge and resources?*

At present, there are no plans to continue the project. Without funding, there is not the financial or resource capacity to continue its work. The project delivery model could easily be replicated by future projects and would be recommended to those delivering projects of a similar nature, since feedback from teachers illustrates the success of this model in positively changing outcomes for staff, pupils and schools. The project content and method of delivery was reliant on the expertise of the project lead, and would therefore be more difficult to replicate with the same degree of success. However, as the evidence of the wider system outcomes demonstrates, a programme of training staff in the strategies and delivery could be used to good effect to disseminate the messages more widely, whether that be in individual schools, boroughs or across a wider landscape (e.g. pan-London). There are currently no plans in place to share the project knowledge and resources more widely. The focus of the project was delivery in schools for maximum impact in those schools, so there was limited capacity to create a project legacy (e.g. a website) and it is acknowledged that this is an area of weakness in this project's model of delivery.

12. Final Report Conclusion

Please provide key conclusions regarding your findings and any lessons learnt.

Alongside overarching key conclusions, headings for this section should include:

Key findings for assessment of project impact

- *What outcomes does the evaluation suggest were achieved?*
- *What outcomes, if any, does the evaluation suggest were not achieved or partly achieved?*
- *What outcomes, if any, is there too little evidence to state whether they were achieved or not?*

There is considerable evidence, both quantitative and qualitative, that demonstrates the project achieved its intended outcomes. As a result of intervention, teachers are now more confident in the teaching of mathematics at the participating primary and secondary schools, including challenging their more able pupils. Evidence all shows that in participating schools there has been an increase in the delivery of higher quality teaching which includes more sharply focussed and refined subject-specific teaching methods. Furthermore, teachers have access to, and are making better use of, Maths resources in key stages 2 and 3. Teachers have a deeper knowledge of the curriculum and through the use of more precise pedagogy are able to develop pupils' understanding more rapidly. These improvements in pedagogy, resources and confidence have impacted on pupil outcomes. Quantitative data and qualitative evidence shows that for pupils benefitting from the project intervention there has been improved educational attainment and progress in Maths. The project initially set out to target more able pupils and there was a marked increase in progress and attainment for this group. However, the intervention strategies and resources were equally applicable to pupils of all abilities; consequently there was also a marked increase in progress and attainment for all pupils. Analysis of data for sub-groups (including: boys, girls; SEN; FSM; Ever 6 and EAL pupils) showed that the increases in progress and attainment were similar for these groups. Therefore, the project intervention impacted a wider group of pupils than was initially intended and the impact was equally beneficial for all sub-groups of pupils.

Looking to the future, this would suggest that the strategies advocated by the project could be applied widely in other schools with the potential to impact all pupils in primary and secondary settings. The project also aimed to support teachers and schools with making greater use of networks, other schools and colleagues to improve subject knowledge and teaching practice. The intervention provided numerous opportunities during CPD training for teachers to discuss pedagogy and evaluate their practices. It also allowed considerable time for individual teachers to reflect on their practice and provide guidance and support to participating teachers from each school in ways to disseminate the new approaches to pedagogy in their schools. While the success of this outcome was more difficult to measure, a wealth of qualitative feedback reveals that in a large number of the schools, the new practices had been adopted by other teachers with similarly positive effects on pupil outcomes. In some schools, the project proved to be a catalyst for considerable development of practices, including in other curriculum areas and in the schools general pedagogical approach, such as developing a growth mindset culture based on the research of psychologist Carol Dweck. Comments from headteachers show that the project has influenced some schools with their strategic development.

Key lessons learnt for assessment of project delivery

- *What activities/approaches worked well?*
- *What activities/approaches worked less well?*
- *What difficulties were encountered in delivery and how could they be mitigated in the future?*
- *Were there any additional or unintended benefits (e.g. increases in student attendance as a result of an intervention aimed at teachers)?*

The project was organised and delivered in such a way so that it could be beneficial to any teacher or school. Teachers with a variety of levels of experience and confidence in their teaching of Maths were all able to benefit from the intervention programme. Although the context for the intervention was mathematics, and there were some areas of pedagogical development that were specific to this subject area, many of the strategies and practices were those seen more generically in excellent teaching and learning. This meant that they could be applied in other subject areas or used to stimulate and inspire schools' values and culture. The blend of CPD days, alongside tailored outreach support for individuals, as well as whole staff CPD training and events, meant that key messages could be delivered to a wide audience, whilst also allowing time for trial in class and bespoke support for individuals. Given the time constraints on teachers working in a busy and demanding profession, one area of challenge for the project was ensuring that all teachers attended all CPD days and therefore understood and were able to use the key pedagogical changes. Furthermore, while the project aimed for schools to be able to tailor the new strategies and methods to their individual school settings, another challenge was to ensure that teachers' approach was consistent with the project's intended methodology. The outreach support was invaluable in being able to provide teachers with the necessary guidance to do this.

Informing future delivery

- *What should the project have done more of?*
- *What should the project have done less of?*
- *What recommendations would you have for other projects regarding scaling up and/ or replicating your project?*

Future projects might like to consider some of the following improvements:

- The training and guidance for benefitting teachers on how to influence practice more widely within their schools, could have included a more directed task to ensure they

disseminated information and in-school training to share learning from the project. This could have then been evaluated to improve delivery of this outcome.

- To stimulate the wider spread of strategies in schools, it would have been beneficial for schools to have two teachers participating in the project. That way, they could have had strategic discussions, relevant to their school, about the best way to implement strategies more widely.
- While there were a number of opportunities for staff from different schools to work together (including joint CPD events), further opportunities to do so would have improved the partnerships and networking between participating schools. A number of the schools were already engaged in partnerships prior to the project and staff from some of these schools engaged in joint practice development (e.g. spending their self-directed study days working collaboratively).
- A central location for all project communications and resources (such as a website) would have made it easier for the project lead to disseminate ley message and provided teachers with an easily accessible source for project materials. It was not possible for such a resource to be provided in this instance.
- A number of the high quality, relevant resources used by teachers were sourced online. Teachers grew in confidence with how to adapt the resources for use in their classrooms. Supporting teacher with ways to create high quality, original resources was one element of the training and the project lead did create some original teaching materials for teachers to use in class. However, if more time had been available, an even greater bank of original resources, specifically designed to support the overall aims of the project, could have been created.
- The outreach visits were invaluable to the success of the project, but it proved a challenge for one person to deliver the support to every project school. While this did ensure that quality of training and advocated pedagogical practices were consistent in all project schools, to scale the project up further it would be necessary to have a greater number of people involved in project delivery. However, there is considerable scope for developing a network of trainers who could then deliver and cascade training in a much wider network of schools.
- While it is acknowledged that data collection and analysis is necessary for evidence based action research to have reliable and measurable outcomes, a considerable amount of time and effort, in schools and especially in the project delivery, was spent collating, organising and analysis a vast amount of quantitative data. This reduced the amount of time available for the development and delivery of training, and resources. In particular, this led to a reduction in time available working directly with teachers and pupils, which is the activity that has the greatest impact on outcomes for schools, teachers and pupils.

Appendices:

1. *Summary of qualitative feedback: Teachers*
2. *Summary of qualitative feedback: Headteachers*
3. *Teacher Self-Evaluation Form*

Extending More Able Mathematicians LSEF Project (1136)

Appendix 1: Summary of Benefitting Teacher Feedback

The three sections below show the feedback received from benefitting teachers in response to a post-intervention survey asking for feedback about the impact of the project on the three key outcome areas:

- **Impact on teachers**
- **Impact on pupils**
- **Impact on the wider school**

The questions used in the survey are shown at the top of each section.

Impact on benefitting teachers:

Question: What impact has the project had on the quality of teaching, learning and assessment of Maths in your class?

Teacher confidence:

- The project has had a direct impact on my confidence and approach to teaching maths to the more able set.
- I am now more confident in challenging more able children with problem solving at an early stage of the lesson. I am comfortable with letting them struggle for a little while before offering help/ clues (which they often refuse).
- I feel that my confidence has grown. I am able to be less formal in my teaching, allowing children to be more independent learners. As the children have more responsibility over their learning. I am able to guide children who need help. The children who feel they have the maths to approach the task in hand are able to continue and I am able to support them when the need it.
- I feel more confident in teaching problem-solving type L6 maths in particular and the ways in which I can make sure this is at an appropriate level for the group. This has given me more evidence (thought bubbles especially) to be able to teacher assess children via levels. The learning for these children I hope has been better as they are challenged more effectively than in previous years.

Extending and challenging pupils:

- I have a much better understanding of how to extend the more able mathematicians. I have used tasks which require a much deeper understanding and often tasks which involve the children not being able to find an answer straight away.
- A lot because it made me think about problem solving and going deeper with the children's learning. I think it helped me to change my teaching and improve it – particularly with problem solving.
- I now challenge children to explain their reasons for answers using precise mathematical vocabulary. I also challenge them to consider a method of recording their answers, rather than offering one immediately.

Enriching Maths learning:

- Use of lots more reasoning.
- Lot more peer marking to support each other.
- My teaching has developed to ensure more consistent use of exploration, investigation and reasoning.
- It has made me more aware about the different areas within Maths e.g. problem solving/reasoning. I have found that the questioning used within lessons has improved and the understanding of the children is deeper because of this.
- I am more aware of the need to develop thinking skills and children are more able to say "why" (giving an explanation) due to this. I think more creatively when planning.
- I think more carefully about the tasks I give the children. Children are encouraged to explain their thinking and strategies. The majority of the higher ability children have enjoyed the challenge and

are very good at explaining and expressing their thoughts and strategies. The biggest impact is on the level 4/5 children. Assessment through observations has significantly improved.

- The standard of Maths learning has both improved and increased this year. The level of open challenge and effective Maths taking place is of a much higher quality. Assessment has been easier formatively, but am still trying to find a way to capture it accurately using summative assessments
- The learning has been much more pupil led – [resulting in] greater discussion and cooperation
- I believe that my teaching has improved over the course of this year through the use of problem solving tasks. Specifically, I have begun to ensure that many of my activities in my lessons are student-focussed and student-led, and that my use of questioning is less leading than before (i.e. students are not led to the answer but encouraged to think for themselves more). I have also begun to use different styles of formative assessment within lessons, particularly giving students more thinking time before discussions and planning to include more verbal feedback. (Secondary teacher)

Impact on benefitting pupils:

Question: What impact has the project had on the pupils in your class?

Impact on progress and attainment:

- The more able children are extended.
- Good impact - lots of level 6's this year.

Developing Pupils' attitudes to Maths:

- Many of the children (including the high level 4 and low 5 children) enjoy the challenge of not finding the answer straight away. They are beginning to understand the importance of thinking and using what they already know and how this helps them to solve a problem.
- Many children have expresses how they enjoy maths now and the majority enjoy the thought bubbles as they feel they help them to think through a problem.
- The class have become excited about maths. They enjoy the challenges presented to them. There is a real `buzz` in the lesson
- The children have enjoyed the project and regularly talk about the growth and fixed mind set
- The children are seeing the purpose of mathematics more
- They are enjoying mathematics more

Pupils embracing challenges:

- Children enjoy solving challenges, are more able to respond, break down or simplify complicated problems. They are proud of their own achievements and successes and use positive language (embracing the struggle) when challenged.
- Children are more confident in tackling problems and talking through starting points. They have developed perseverance and resilience in their maths learning.
- The children look forward to their problem solving lessons.
- Children are much more engaged and for longer. They are questioning their own understanding and challenging themselves, where previously it would have mainly come from me.
- There are now a few children who are L6 mathematicians who previously had no stamina for a challenge – they are now more resilient and can persevere.
- The children are now more likely to push themselves in Maths and now see the "harder" learning as fun.
- The project has had a very positive impact on the class. It's ok to struggle because you are in the process of learning. The children enjoy Maths because I think I have been more creative with how it is delivered (e.g. games & dice)
- Most students are able to attempt more difficult questions within lessons, due to both being more confident in their mathematical ability and their problem solving skills. (Secondary teacher)

Pupils' Mathematical Skills:

- They have benefited from problem solving activities – they have learnt to be more systematic and to think logically. They have also had to explain their thinking more and this came from ideas taken from [project lead].
- Children are more articulate about Maths
- They are a lot more confident about expressing their thinking verbally and in writing
- The whole class are able to record their thoughts and discoveries and decisions using thought bubbles. This has helped them to be more precise in using maths language and explain their findings more clearly.
- The children are now more confident in explaining their reasoning both verbally and in writing.
- They are more able to say why or give explanations. They are more aware of the links between science and Maths.
- Most children expect me to ask them "How do you know?", "Prove it" etc. Many children enjoy thought bubbles but all are happier to explain verbally.
- Much better Maths vocabulary and more likely to try different approaches
- Some have gained confidence in being able to pick apart more extended GCSE style questions and apply their knowledge. Students have also become more adept at justifying their answers and being able to explain their reasoning verbally and in writing. (Secondary teacher)

Impact on the wider school:

Question: **What impact has the project had on the teaching and learning of Maths more widely across your school?** (Either because of the whole staff CPD events, or best practice being cascaded by you)

Question: **How effective did you find the whole school CPD events?** (i.e. Staff meeting; expert speaker events)

Impact on whole school Maths:

- The school has really benefitted from the lessons that [project lead] came in and demonstrated. The enjoyment that he had for the lesson got the teachers who observed him inspired, whether they had 20 years experience or 1 year.
- Due to the [project lead] CPD teachers are more aware of how to challenge their more able learners.
- The staff meeting and Maths conference were very effective. The staff meeting led by [project lead] inspired a lot of the staff and as a school began to implement guided maths where some of the maths games can be played.
- The ideas expressed and shared during these meetings [project led CPD] are being developed to deepen and improve the maths skills and learning across the school.
- Staff meeting was excellent for encouraging whole staff to see importance teaching mindsets to children. The maths conference was also really good, especially for the opportunity to network and also sit and talk to the KS1 and EYs teachers (from my own school) about maths, as these opportunities are usually very rare otherwise.
- Staff meeting and lessons where [project lead] team taught were both excellent at making staff aware of the strategies that could be used across the school and year groups and of the benefits proven by this.
- The staff meeting was very effective as all staff were involved and were inspired (even if not necessarily now using in class). I think we now need to push this in our own school.
- A lot of impact. This is because the teachers came to the staff meeting on growth mindset – which underpinned our whole school focus for this year. They also enjoyed the [expert speaker] training session and went and took ideas from it to use in class. This was then followed up by 2 teachers attending the course [provided by project lead] which they both really enjoyed and were able to apply ideas from straight away in their planning. I think it has been a very positive project.

Developing a Problem Solving approach

- Staff enjoyed the staff meeting [led by project lead] and both [my colleague] and I thought it reinforced what we try to do as a school in terms of maths – contextualising learning and strongly implementing using and applying across the maths curriculum.
- More teachers are using open ended or high ceiling problems with their classes, they ask me for advice – how to teach children to record or what to do next, so the channels of dialogue are definitely more open across the school and from KS1 to KS2.
- There is now a cohesive approach to this [problem solving approach to Maths] that all the children understand and transitions across year groups easily.
- Problem-solving has a larger part to play in our maths curriculum.
- The more able are challenged more frequently in some classes where teachers have adopted the approach of low threshold, high ceiling tasks.
- Whole school focus on problem solving. Improving the depth of knowledge and Maths vocab [in children]. The project was pivotal in driving this forward.
- As a team, we have started to develop the way in which we approach problem solving. Instead of viewing it as stand-alone investigative tasks, we have begun to integrate problem solving into our lessons through our use of questioning and through allowing students the time to explore more difficult problems with our guidance. (Secondary teacher)
- I think the key messages both from the staff meeting and the workshop were really helpful in terms of giving staff a focus and aims for problem solving which we did not have before. They also gave really useful advice on where to find suitable activities and some starting activities for staff to use with students. The guidance from both [project lead] and [expert speaker] have also helped to give a more formal structure to activities that we have used in class, thereby ensuring that we can identify the progress made by students. (Secondary teacher)

Mathematical Communication:

- Maths is [now] taught in context.
- More people are using the thought bubbles in maths.
- The children enjoy doing the thought bubbles and they have used this independently in the other areas of the curriculum.
- All teachers in all classes have been trained via a staff meeting in using thought bubbles to record problem-solving tasks.
- Teachers across KS1 and 2 are now using thought bubbles
- Other teachers in KS2 have taken the thought bubbles on board and are being more investigative. It is yet to roll out to KS1.
- Other year groups are adopting the use of thought bubbles within problem solving lesson. However, this needs to be followed up with KS1 & year 6, which will be the aim next year.
- Gradually developing the use of thought bubbles. Staff are more confident to use creative Maths challenges and games
- Many other year groups have used thought bubbles (especially year 3).
- Thought bubbles have been used by other year groups and they have found them really helpful especially as evidence to a child's thinking and understanding of a concept.

Effectiveness of CPD training and events:

- Have been using Nrich [website for resources] more and have started to use STEM [website for resources].
- Very effective [CPD], good range of resources, opportunity to meet other maths teachers
- Very effective as it gave a good resource bank for staff to use. It also gave the chance for teachers to discuss issues they have and what is working well
- It was useful for gaining some resources and hearing how this works in the new curriculum
- Very effective. Lots of simple activities and ideas to take away.
- Excellent – the parents were also extremely complimentary about workshops
- Looking forward, we have included sets of rich tasks into the schemes of work for September in years 7 and 8 and are currently discussing how to adapt these for older students, to provide the 'mastery' skills across all topics and all abilities. (Secondary teacher)

Project self-sustainment:

- I conducted a staff meeting after the maths conference which was very successful as I discussed and showed many of the ideas given to us on that day which have been used by many teaching staff.
- I have been able to share the strategies of deepening thinking, resilience and challenge with my class teaching assistants and year 6 team.
- We have 2 maths co-ordinators at [my school] and this year we have been focusing on what makes outstanding maths teaching. We have incorporated this and other teaching strategies into our next year's school development plan for maths.
- We have had a few INSET and staff meetings on maths all of which have looked at application and mastery of skills and developing a growth mind-set in children.
- Also continuing on from the staff meetings in the autumn term I have since taken 2 more. One giving the staff their own maths challenge! I have also had a meeting with the TAs in the upper school to discuss the recording of the children's work.
- 3 TAs attended the conference in April and went to different workshops. All of them were able to feedback to the relevant Key Stage staff the key messages from the conference and explain what they thought we were already doing in relation to the points made, and things they thought would be particularly effective to introduce.
- All KS2 teachers were enthused after I ran a staff meeting and are beginning to use "I know I'm right because" and "I know you're right because"

Challenges Faced:

Question: What obstacles/barriers have you encountered that have hindered the implementation of the project strategies?

- Staff are eager and enthusiastic, but somewhat reluctant to fully embed their teaching this way. Time, resources and a lack of drive all contribute. I think pressure for levels doesn't help much either.
- Time – being the Year 6 teacher I have found it hard to always attend the courses as have been on a tight time schedule for ensuring rapid progress this year.
- Time. I have been acting as Deputy Head to cover a maternity leave, and now and again to release the Headteacher to support another school 4 days a week. I myself am teaching Year 6 four days a week as well as leading literacy and maths in KS2. Much as I think the strategies and suggestions have been valuable, trying to find the time to create new worksheets and locate resources when I already things I have used previously that I know work, has been difficult.
- The constraints of the secondary schemes of work have meant that it has been difficult at times to incorporate the problem solving strategies as much as I'd have liked. However, as we have made significant changes to the schemes of work from September this should be solved. I think it would have been useful to have more than one teacher from [our school] involved. As we are such a large school with not a significant amount of contact time within the maths team it has, at times, been difficult to promote problem solving across the whole school. (Secondary)
- Some members of SLT not on board. As a part time teacher my other half doesn't always push the investigative process in the same way I would
- Not being the maths leader within school has hindered some strategies as it has been difficult to implement everything even though the maths leader is supportive of the project.
- Teaching the one off maths lessons was difficult as we are three form entry and we also had a fourth maths teacher so we all needed to be teaching the same sessions.
- Other year groups taking these ideas on
- Staff – having time to come back together throughout the year.
- Pressures of SATs and testing can be restrictive. Also teachers own confidence to step away from their normal style of teaching, or even confidence in mathematic ability can also hinder them giving out challenging work.
- Pressure of SATs

- The biggest obstacle is finding resources. We have adapted many resources.
- Some of the current year 6 [pupils] has been a barrier to the implication of some of the strategies used in the project.
- A challenging class. Many children with low self-esteem and emotionally challenged, so they found the [Maths] challenges difficult – they found it difficult to persist.
- I think that some of the children in Year 6 needed more skills in maths to be able to access the problem solving lessons in a way that was meaningful for them (particularly at the start of the year).
- Tutored children.
- Tutored children & parents [expectations]

Main challenges: time, pressure of testing, packed curriculum, lack of whole school approach, leadership not supportive, pupils' existing skills, pupil behaviour,

Project Impact: One year on

One year 1 teacher responded to a survey regarding impact one year post-intervention. The responses are shared below:

- **What impact has the project had on the quality of teaching, learning and assessment of Maths in your classroom in 2014-2015? Have you noticed any changes/improvements in your practice this year as a result of what you learned last year?**

The 'mastery' element of the new national curriculum has been something which has fitted nicely with the concepts of the EMAM [Extending More Able Mathematicians] project. I have been able to provide better stimuli for children who are secure in concepts but need to continue to master them rather than be pushed onto another subject area. This is something other staff have struggled with. The impact has been a higher number being able to tackle more complex problems akin to the old Level 6 papers - although only 7 children achieved the Level 6 in the SATs results, we had a cohort of 18 (20% of the year group) able to attempt the paper all of whom scored a decent number of marks.

- **What ideas and strategies gained through the project been applied in your school this year?**

As maths co-ordinator, I have provided staff with packs of 'maths games' which can be used both in lessons and during early morning work (children have rolling entry rather than a bell in the morning so there are tasks for them to get on with from 8:40-9). Embedding more maths in the day through logic puzzles and systematic pattern/code type exercises has given the children more confidence.

- **Have you adapted/ developed/ built on the idea and strategies shared through the project last year?** (Please explain.)

I have continued to search for more and more resources to support this way of working and provide coaching and resources to other staff in school. At the same time, the fundamentals of the maths teaching at [my school] have been under review in terms of subject knowledge and especially the teaching of basic number system and mental maths. This has proven challenging as teachers haven't felt they 'have time' to enjoy the wider approach.

- **What impact has the project had on the teaching and learning of Maths more widely across your school?**

I have seen more specific thought and provision being given to the more able and what they need to be pushed in lessons. This has been partly due to the project; partly due to a revision in our planning formats, which specifically requires a higher skill to be planned for; and partly due to the new curriculum's aims to stay within the curriculum for the age group and broaden/deepen knowledge rather than moving into the next year group's territory. All these things have meant teachers need to offer alternative ways for children to investigate and understand their concepts as well as just completing examples and exercises.

- **What effect has the project had on the way more able pupils have been challenged this academic year in your school?** (Please provide details.)

It has contributed to a greater focus on the more able and a better quality of challenge asking the children to think laterally rather than just do the same things but with bigger numbers or with decimals. They are better able to then relate their maths to real life situations.

- **Has the project impacted any other areas of learning in your school other than Maths?**

The systematic working required to tackle wider maths problems has had an impact on the children's approach to scientific investigations too. They are more ready to draw a table to log results and look for patterns. This has helped them to carry out experiments with more independence.

- **Do you have any other feedback you would like to provide?**

The opportunity to work across schools was excellent - something teachers need better access to. This should be easy now that the world is online but it is finding the time to share and ask. It was invaluable to discuss solutions to our common problems during the project. Thanks for all your work on it - it was a highlight of my time at [my school].

Extending More Able Mathematicians LSEF Project (1136)

Appendix 2: Summary of Headteacher Feedback

The three sections below show the feedback received from headteachers in response to a post-intervention survey asking for feedback about the impact of the project on the three key outcome areas:

- **Impact on teachers**
- **Impact on pupils**
- **Impact on the wider school**

The questions used in the survey are shown at the top of each section.

Impact on benefitting teachers:

Question: What impact has the project had on the quality of teaching, learning and assessment of Maths in their [the benefitting teacher's] class?

Teacher confidence:

- [The teacher's] confidence in effectively checking pupils' understanding throughout lessons and intervening in a timely way has also seen improvement and this has had a notable impact on the quality of learning for all pupils, not just the more able.
- Increased confidence at teaching more able pupils and greater understanding of assessing gaps on learning particularly at a higher level.
- (More) confident teachers, greater depth of understanding of subject knowledge and awareness of expectations at a higher level of functioning. Activities planned to suit group needs.

Extending and challenging pupils:

- [The teacher's] expectations have been consistently high but have been raised as a result of her involvement in the project. The level of challenge for the more able children has been very effective at broadening their understanding and increasing their ability to apply what they have learnt to a variety of different contexts.
- More able children challenged via differentiated planning and rigorous assessments.
- His ability to challenge pupils through depth rather than moving onto more complex skills/concepts has improved and he sets more open ended tasks which encourage thought, explanation, reasoning, generalising, predicting etc… which has given children more challenge as they are now approaching maths in a different way.
- [The teacher] is an outstanding maths teacher who has shown real and tangible impact with the more able children. With 7 obtaining L6 last year and 10 being out forward for it this year, it shows a real confidence in her ability to plan, differentiate and more importantly recognise the needs of all children.
- He provides a good level of challenge for all children. He provides more able children with rich sophisticated problems allowing them to deepen their knowledge and application of skills.
- Changes in the organisation of her lessons has led to a change in teaching style, meaning she is now more likely to focus on the more able pupils specifically at some point during every lesson, rather than having longer focus sessions with them less frequently. More able pupils are in the whole class main teaching session less frequently and are expected to start more lessons by applying what has been specifically taught to them the day before, rather than having a slower start to the lesson where they were not necessarily learning from the start. [The teacher's] assessment is more regularly and tightly focused on the more able pupils.

Pedagogical development:

- The quality of teaching and learning in their class is consistently good with some outstanding features. The project has provided the teacher with a greater knowledge and understanding about how to deepen children's knowledge and application of mathematical skills. There is a greater emphasis on reasoning in the classroom and this is evident in lesson observations, book scrutiny and discussions with pupils.

- There is evidence in her lesson observations that her ability to accelerate the progress of target groups in her class improved during the year.
- [The teacher's] knowledge of the maths curriculum was further enhanced and it assisted her to foster deeper thinking in her more able pupils.
- There have been definite improvements and innovations in the teaching of maths problem solving and using and applying.
- There has been a very strong focus on developing reasoning in maths.
- It assisted in broadening her mathematical teaching and learning.
- The teacher involved in the EMAM project, plans lessons very effectively. He has been able to use the project to ensure that the children in his class take up the challenge. In lesson observations he shows that he is able to use questioning effectively, he is able to identify pupil's common misconceptions and act to ensure they are corrected. He gives good feedback to children that they are able to use to improve their knowledge, understanding and skills.
- Lesson observations have demonstrated that [the teacher's] questioning has improved further over the year she is able to impart mathematical knowledge at an appropriate level to ensure that pupils are engaged in learning. She uses a range of effective teaching strategies and well-targeted extension activities so that more able pupils learn well in maths.
- Our teacher has a better understanding of how to challenge children in different ways, in particular how to develop children's abilities to explain their thinking and reasoning and question their own work. He is more thoughtful when planning and uses less worksheet based challenges to move children on. His assessment of pupils in terms of skills and concepts has always been accurate. However, he is now much more confident in assessing children's ability to use and apply knowledge in a range of different contexts, leading to more targeted planning to develop children's ability in these areas.
- [The teacher's] use of questioning to extend her more able students has improved greatly during her time working on the project; students are required to think and work independently in her classes and this is reflected in their classwork and assessment results. Lessons are increasingly student-led and student-focussed and students at the top end have consistently made progress throughout the year. (Secondary school)
- Thank you for this project; [the teacher] feels that it has had a really positive impact on her teaching, and it is great that someone has taken responsibility for leading a project like this.
- It has had a good impact but I think potentially it will have an even greater impact next year. The idea of challenge for all levels and encouraging children to challenge their own thinking as well as their mathematical knowledge.
- The project has had a very positive impact on the teaching, learning and assessment of Maths in [the teacher's] class. It has had a huge impact on the style of [the teacher's] teaching, how she uses assessment information in her teaching, and mostly on the structure of her lessons; the more able pupils are challenged from earlier on in the lessons. This is part of an ongoing drive to improve teaching and learning for higher attaining children in maths.

Observations:

- Lesson observations have shown that [the teacher] is consistently good and often outstanding in her ability to challenge pupils who are considered 'more able' during maths lessons. Often, the 'more able' are set their own level of challenge and have been given time to work independently on tasks as opposed to sitting through lesson introductions that may have been below their ability. There has also been a far greater emphasis on getting pupils to explain their understanding as opposed to just finding solutions.
- [The teacher's] maths lessons are outstanding. She models for new and existing teachers and teachers from other schools who visit. Her awareness of attainment and progress and the analysis of it has been used to ensure that all staff are aware of their target groups and individuals as she has shown in the Pupil Progress Meetings she has held.
- During the last two lesson observations (following intervention), which were graded Outstanding, differentiation was marked out as a strength. In December [at the start of the intervention], a maths lesson was graded as good.
- [The teacher] is outstanding in terms of challenging more able pupils in maths lessons. [The teacher's] maths (and other) teaching is now consistently outstanding, as verified by **Ofsted** in May '14. [The teacher's] subject knowledge in terms of high L5 and L6 maths has improved.

Impact on benefitting pupils:

Question: What impact has the project had on the pupils in their (the teacher's) class?

Impact on progress and attainment:

- Outstanding achievement and highest level 5 outcomes for 5 years.
- Phenomenal results in KS2 SATs, 11 children achieved L6 in Maths
- The increase in L6 results this year suggests a positive impact.
- There was a considerable increase in the number of L6 results this year.
- The class achieved very well in their SATs results and the progress was very pleasing. It has also raised the interest levels of some of those pupils who find maths a challenge or less interesting than other subjects.
- Five of the six children who sat the level 6 paper passed.
- The project has had a positive impact upon the quality of teaching and learning taking place in year 6 this year. We had 10 pupils (just under a third of the class) sitting level 6 papers this year which was very encouraging. I feel that this has been partly due to the support that [the teacher] has been able to provide this group with, in light of attending the course. We will obviously know a little more once we have collected and analysed end of year data.
- The pupils are very confident and articulate when explaining mathematical tasks. Their ability to reason about a problem has significantly improved. This is evident in books and in discussions with pupils. Data shows good progress for all children, 89% made expected progress, 52% of children made more than expected progress. Where children have made below expected progress there are specific learning needs that have prevented those children from making expected progress.
- Her pupils' understanding of mathematical ideas and use of vocabulary has clearly developed. Lesson observations, monitoring of planning and book scrutinies all show a much greater use of real life maths to motivate and inspire the children in her top maths set. Pupil voice showed that this was something the children very much enjoyed. She noticed that the children's levels when faced with a type of assessment really soared.

Pupil motivation and engagement:

- The children talked very positively about maths in their report comments.
- The pupils are more engaged in lessons and show more determination to succeed.
- Pupils are very engaged by exciting activities and are more reflective both before and after tackling tasks through use of thought bubbles.
- The pupils have enjoyed lessons as they feel that they have been suitably challenged. Pupil engagement during lesson observations is always a strong aspect and pupils have appeared far more confident at tackling some of the more complex topics within the maths curriculum
- We think children have enjoyed the extra challenge overall. Some have found the challenge difficult but it has benefited their thinking. They are also able to sustain concentration and focus for a longer period.
- Children feel challenged as a result of her teaching. They comment on how 'tricky' they find things and yet she supports in a way that make progress.
- The more able pupils are more motivated as they know they are being treated differently when they are not in the whole class session because more is expected of them. They are more resilient, because they have to get on with it while the teacher is with the rest of the class, and they are better at working together as a group and explaining their reasoning. The pupils – including the more able pupils – are on track to make good progress in maths by the end of the year.

Pupils embracing challenges:

- The pupils in [the teacher's] class are more enthusiastic about finding work challenging in maths; this includes both the higher attaining children, and children at other levels of attainment.
- Children's attitudes to their learning have improved dramatically as they now talk about wanting to make mistakes, as that is when they truly learn. They are beginning to accept challenge and making mistakes as part of the learning process.
- The pupils understand that there is more to maths than getting the right answer.

- There has been an increased confidence in Maths for all children. Of particular note are two children who had a very negative view of themselves as Mathematicians. They are not high achievers, but responded well to many of the strategies [the teacher] adapted to match their level of ability by drawing upon ideas shared via the project.
- Students of all abilities have responded well to the problem solving activities and as a result most are able to access more challenging material. They are now using the skills they have developed in order to attempt questions that previously would have been viewed as 'too difficult'. The culture within the classroom has developed into one where students are able to ask and be asked stimulating questions and extend their knowledge beyond the topic being studied and many students seem more confident in their mathematical ability. (Secondary school)
- Children have enjoyed choosing higher level ability challenges in their lessons and for homework. They are pleased when they make marvellous mistakes so that they can learn from them.

Mathematical communication:

- Their understanding of mathematical vocabulary is better and they are more able to articulate their ideas clearly.
- They are using their "thought bubbles" more to explain their reasoning and have developed their mathematical vocabulary more in their reasoning. These "thought bubbles" also give the quieter children in the group a voice and [the teacher] could assess exactly how they were thinking about tackling a particular task.

OFSTED:

- In a recent **OFSTED** [inspection], the progress of the more able children was highlighted as a strength. I attribute this to the work that [the teacher] has undertaken and the project has been a key part of this.

Impact on the wider school:

Question:	**What impact has the project had on the teaching and learning of Maths more widely across your school?** (Either because of the whole staff CPD events, or best practice being cascaded by the teacher on the project)
Question:	**Has the project impacted any other areas of learning in your school other than Maths?**
Question:	**How effective did you find the whole school CPD events?** (i.e. Staff meeting; expert speaker events)

Impact on whole school Maths:

- This project has not only supported the progress of children in [the teacher's] class but across the school.
- Four teachers went to the [expert speaker] workshop and found it really useful. They said they will explore the place value and difference task and record indirect learning and links made by children
- As stated this has had a significant impact on the teaching across the school. Teachers are now using ideas and materials shared by [the teacher] to challenge the more able pupils in a way they have not done so before
- This has been part of an overall drive to improve the teaching, learning and challenge of all children in particular high attaining children. The focus on this that the project has provided has had a very positive impact on the maths within the school; however the model that most staff have adopted is a model that differs from that investigated during the task. However, there is at least one year group in addition to Year 6 (Year 2) who have successfully amalgamated features discussed at whole staff CPD that [the project lead] provided, with the features of the other model, and this year group have made outstanding progress this year.
- In subsequent Numeracy lesson observations (by the school's SLT) there was strong evidence that staff used techniques, resources and questioning skills as demonstrated during the role modelled sessions.

- This staff meeting provided excellent information and activities to support mental maths strategies. Staff response was very positive and in lessons observed across the school these strategies are being used effectively to support children in their mathematical development.
- These (whole staff CPD sessions) were very well received and I think helped staff to understand the importance on reasoning and the idea of low threshold, high ceiling tasks. This had an impact throughout the school including in the foundation stage where they have been doing more investigations.
- The staff meeting and the [expert speaker] workshop were both excellent.
- [The benefitting teacher] and the other teachers who attended the conference have returned to school with an increased enthusiasm for maths and were provided with staff meeting time to disseminate this to other staff. This has helped to further develop a positive climate for maths learning in the school.
- These [CPD events] were very good quality and pitched appropriately for staff. It was good to see that EYFS had not been forgotten!
- The workshops were outstanding. We brought almost our entire staff to one event, with a smaller number attending the second session due to a CPD clash. The feedback from these has been excellent with useful ideas and methods shared.
- Key learning taken forward from the training [NOTE: these are the conclusions drawn by the school following training and were not necessarily all messages delivered through project training]:
    - Doing and recording are 2 different skills
    - You need to give the children opportunities to decide where to start
    - Don't make children feel they have to use/recall the methods **you** have modelled
    - We need to train the children to notice things
    - An ideal maths set up – ¼ time number crunching, ¾ time using mathematical thinking and reasoning [Note: the project did not specify a set proportion of time to be spent on a particular area of Maths learning – the school have come to this conclusion as the best way forwards]
    - Children need to explain their thinking to us, not us to them
    - Less talking and infliction of our thought and methods
    - Asking children to make a prediction is the best way to start a lesson
    - Reflect on your learning - Children need to reflect on the skills they've used
    - Train children to unpick their thought process
    - 'A proficient problem solver can talk about their problem solving.'
    - Up to level 2B – children should report their findings through pictures/working out
    - Above level 2B – children should begin to display abstract thinking and draw on patterns and known facts to justify their reasoning.
- Through staff CPD, members of the mathematics department have begun to realise the impact and importance of integrating problem solving into lessons and the key differences between problem solving and investigative work. [The teacher] has been able to lead training sessions based on problem solving with the skills that she has developed from both using and creating activities within her lessons and attending CPD sessions included in the project. Staff members have implemented the strategies within lessons and feedback from the activities [the teacher] and [project lead] have provided has been extremely good in terms of the benefit to students and the development of students' mathematical and logical skills. Many of the key concepts from the project have helped us to develop our new schemes of work for September in line with the curriculum changes. The department found the CPD events engaging; staff felt that they gained ideas and structure that they were able to implement in their lessons. It also gave the department a focus around which we were able to develop new styles of lessons and consider ways in which we might build problem solving skills into our lessons. (Secondary school)
- The CPD events were excellent and provided staff with a number of practical ideas for them to try out in their classes. They also provided teachers with a greater understanding of the new curriculum and importance of developing fluency, reasoning and problem solving skills in children. The math conference was also excellence and all the staff that attended were able to take something from the speakers.
- [The teacher] cascaded the information she gained from the project and this also assisted other teachers' teaching of mathematics particularly in Year Five and Six. [The teacher] was able to share information and good examples from her own teaching of mathematics to support teachers with their planning.

- She shared ideas on how to extend questioning and her use of real life maths to support target groups.
- The programme had such an impact on the staff and their ability to teach Numeracy.
- Improved confidence and progress in year 5 and 6. Teachers vary their approaches to teaching specifically using real life contexts to teach maths in KS1.
- Our teacher has given some feedback to teachers in staff meetings and shared the practice that he has implemented in class. He has also offered some support to some of his colleagues in school, mostly in year5 and year 6. The work from the project supports the Maths Mastery approach being used lower down in the school and has allowed the teachers in KS2 in particular to adopt an approach focused more on depth.
- As a school, we have set aside time for [the teacher] to feed back to staff during staff meetings and share best practice. Once such idea that has been very popular is the use of thought bubbles and light bulbs to explain a child's thinking alongside their working out. It has also been clear that from observing other teachers that they have sought advice from [the teacher] as to what teaching strategies they could use to ensure that their pupils get the most out of maths lessons.

Impact on other curriculum areas:

- The project has been really useful. Teachers have observed [the teacher] and we are much more confident at challenge for more able in maths than we are for the more able in Literacy. We are taking what we have learnt from this to look at reading and writing challenge.
- Whilst reading and reading comprehension has been a big focus for our school, we feel that the EMAM project and the development of the reasoning skills has also improved children's ability in reading comprehension. It has also impacted on their learning behaviour. The children in the class are able to preserve on tasks, they are interested learners who seek out and use new information to develop, consolidate and deepen their knowledge.
- Thought bubbles have been used in Science.
- Children have started using speech bubbles not only in maths but in other area of the curriculum too, and for peer and self-assessment. We have seen lots of evidence of this in our monitoring and book scrutinies.

Project self-sustainment:

- As a school we will be continuing to roll out the EMAM project to other staff members. We have a staff meeting planned for September in which the EMAM teacher will explain the process of the project and best practice that he has used this year. The juniors have all trialled the thought bubbles when working on problems solving and we will want to embed this throughout the school next year. The CPD sessions were excellent and lots of ideas and strategies were given as examples that teachers can use.
- The visit (training) from [project lead] the [expert speaker] CPD event gave teachers some very good ideas at how to challenge pupils, particularly in terms of achieving depth of learning and finding ways to extend children's thinking and understanding within one problem, rather than moving onto a different task or area of learning. Teachers were very positive about the events and there were changes in teacher's approaches in the classroom.
- For those who attended the whole school CPD events, they were found to be most useful and thought provoking. Capacity for cascading best practice and information from the events was limited during this academic year due to the previous status of the school and its priorities within the school. However, there is space for this to be embedded across the school during this academic year, particularly with the appointment of the [benefitting] teacher as Maths subject leader.
- The two CPD events that were held were fantastic and provided staff with some great ideas to try out in the classroom. Once again, we provided teachers with time to feedback in a staff meeting to share ideas that they have tried out in their own classrooms. The feedback from parents was also incredibly positive and many have asked if these information evenings can continue. This is certainly something that as a small cluster of schools, we may be able to continue for different groups of children.
- The impact across the school will be noticeable next year. Staff found the [expert speaker] talk stimulating and made them question certain things within school. This will be built upon next year.

Impact on whole school pedagogy:

- The staff meeting led by [project lead] was successful in leading to a review of the organisation of teaching. There are now fewer traditional guided sessions and more butterflying. There is also an expectation that the most able pupils do not participate in many whole class sessions.
- Our school had a strong focus on developing growth mindset and this project has reinforced the work that we have been doing and it is evident that children are more resilient and determined with their learning. By asking children to explain their ideas in maths, it has helped to improve children's ability to explain their thinking in other curriculum areas
- This has supported our diagnostic marking which we have implemented across the school this academic year.
- The project has encouraged a high degree of professional dialogue and sharing of good practice across the school.
- It has sparked interest in the Growth mindset which we have since had INSET on and will be pressing forward with in other areas next year. We'll also be doing a workshop for parents around this. It has encouraged other teachers to apply more challenge into their lessons in the context of problems. A year 2 teacher in particular has embraced the idea of challenge.
- Not directly yet but with the focus on culture shift towards growth mindset and teaching to groups rather than whole class, this will be an area of focus next year. We are also introducing our 'superskills' – attitudes towards learning - in September and this is closely linked to growth mindset.
- Feedback from teachers was very positive where they attended the conference and the staff meeting was very effective in highlighting research about growth mindset which I wasn't up to speed with. It is underpinning what we do now and what we are looking for in children
- Growth Mindset has been a focus this year at [our school] and this project has helped to support the initiative.
- Staff attended two CPD events, one whole school and one cluster event. As a result they reflected on best practice and took some new ideas back into the classroom. This has helped invigorate the teaching of maths in the school and has tied into whole school developments and action plans.
- Ideas from the conference have been taken on board and built into our School Development Plan for 2015-16.

Project delivery and overview:

- The project has been very beneficial.
- It has been well planned and organised. Communication has been excellent.
- Opportunities to discuss maths with [staff at other schools] and sharing ideas for good practise.
- Just to say thank you to [project lead] as it is his drive and enthusiasm that has helped this project to be so successful. I hope we can continue to work closely with him in the future.
- This is a good opportunity to focus in on one particular area of the curriculum, especially at a time when the new curriculum places so much importance on depth of learning.
- I think it is a thoroughly worthwhile project and think it is extremely beneficial for teachers to have the opportunity to work with other professionals from other settings with different and new ideas and approaches. We would welcome any invitation for any involvement in the future. Thank you for all the hard work that has gone into it.
- The project has been well run and very useful to us as a school. However the key will be next year and how it is followed up as this is when the real impact will occur.
- I would think it is important that the group are able to continue working together next year in some form otherwise there is a great danger that the work this year will be lost. I would be very happy to involve my year 4, 5 and 6 teachers working with at least one other school.
- I would hope that this project would continue as its strength is not only its ability to support colleagues and parents alike but also to ensure that maths is enriching, challenging and fun for all children and that aspiration can lead to self-challenge amongst our pupils.
- Overall it has been a pleasure to work with you on the project I know that the EMAM teacher has embedded many strategies from the project into his daily teaching and has been grateful for the opportunity.

Extending More Able Mathematicians Project
Teacher Self-Evaluation Form

Please note, that this information will be kept strictly confidential to the project and all responses will be made anonymous.

Date:

Please indicate the response that best describes your current teaching and add any comments or thoughts in the larger box.					
	Strongly Agree	**Agree**	**Neither agree or disagree**	**Disagree**	**Strongly Disagree**
I have the mathematical skills, knowledge and understanding to challenge my more able mathematicians.	**1**	**2**	**3**	**4**	**5**
I have *resources across a range of mathematical areas* that enable me to extend the learning of my more able mathematicians.	**1**	**2**	**3**	**4**	**5**
I am *confident in my ability* to challenge and extend my more able mathematicians.	**1**	**2**	**3**	**4**	**5**

Extending More Able Mathematicians LSEF Project (1136)
Appendix 1: Summary of Benefitting Teacher Feedback

Extending More Able Mathematicians Project
Teacher Self-Evaluation Form

I think my more able mathematicians *are currently challenged and extended* in my lessons and are required to *think deeply* about their Maths.	**1**	**2**	**3**	**4**	**5**
My more able mathematicians have the *confidence* and resilience to tackle challenging mathematical problems.	**1**	**2**	**3**	**4**	**5**
My more able mathematicians have the *mathematical knowledge, understanding and problem solving skills* to tackle a range of challenging questions.	**1**	**2**	**3**	**4**	**5**

Current year group:

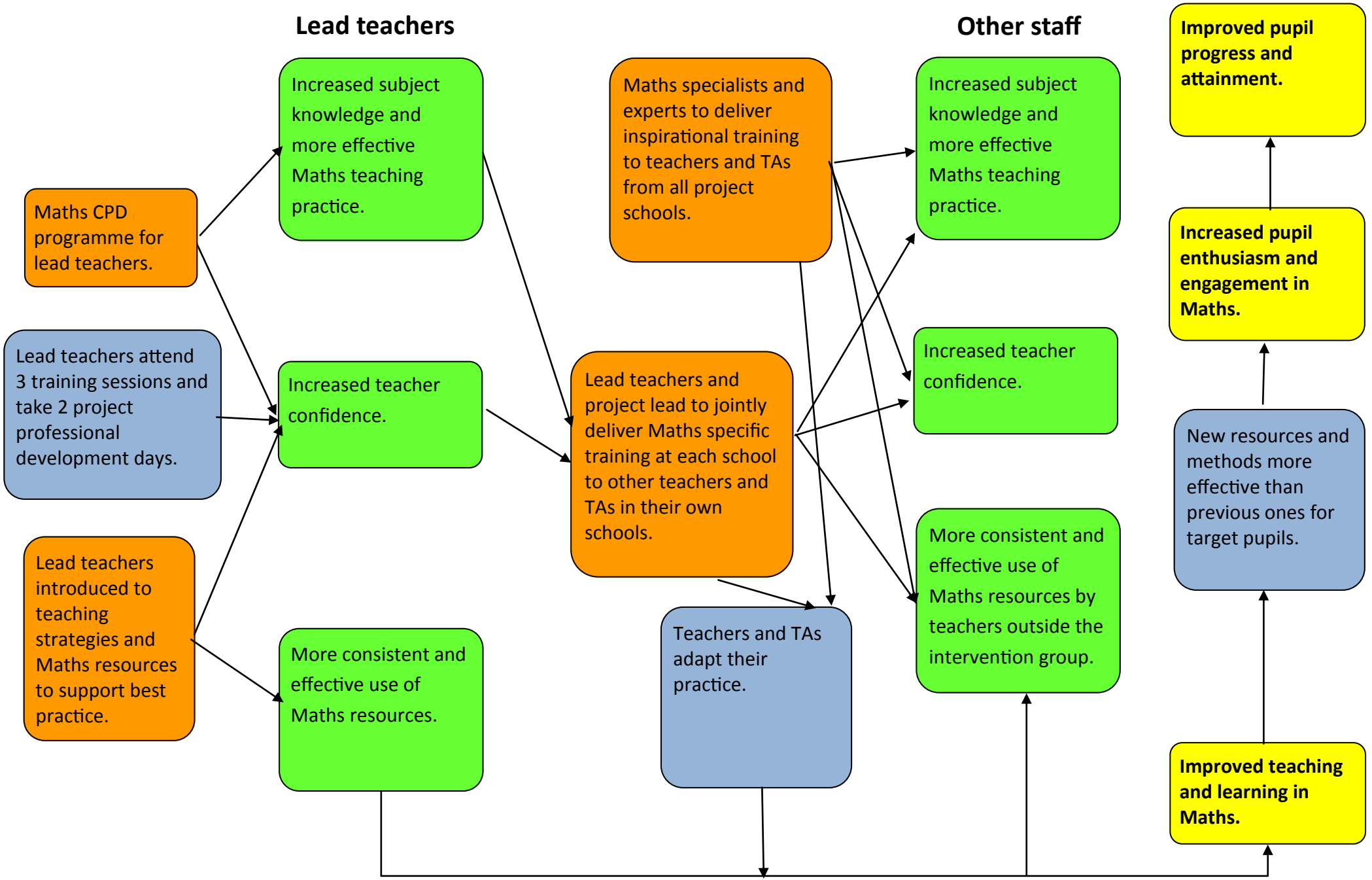
Number of years' experience in current year group:

Number of years' experience in teaching:

Extending More Able Mathematicians LSEF Project (1136)
Appendix 1: Summary of Benefitting Teacher Feedback

Appendix 4

Ridgeway Primary School - Theory of Change



Ridgeway Evaluation Framework

This document is your tailored Evaluation Framework.

It uses the same template Framework that can be found in Appendix 2 of the LSEF Evaluation Toolkit. However, this Framework contains tailored recommendations regarding which outcomes and indicators your programme should evaluate. Outcomes and indicators marked with a tick are recommended for your programme:

☑ Outcome, indicator or data collection method **recommended**

☐ Outcome, indicator of data collection method **not required**

Recommendations have been made in light of your programme aims and methodology in order to ensure that programmes are able to confidently demonstrate the extent of their impact.

For more information, or if you have any questions regarding your Evaluation Framework please contact: educationprogramme@london.gov.uk

	Outcomes	Indicators	Baseline data collection[i]	Impact data collection[ii]
Teacher outcomes **Sub Groups** As part of establishing the baseline, the characteristics of the eligible cohort should be analysed across the following sub groups: ☑ NQTs ☑ 3 years + ☑ Primary/ secondary ☑ Other (project specific) These should be expressed as a % of the whole group. **Churn** Throughout the programme thorough records of any "churn" of teachers leaving or joining the intervention group must be kept. In order to do this records must be kept of: ☑ Unique teacher identifier ☑ Engagement date ☑ Disengagement date and reason	☑ Increased teacher confidence	☑ Increased teacher scores in confidence surveys Survey to be completed by all teachers involved in the intervention. Teacher confidence surveys should be agreed with the GLA. **Note: Our survey was not agreed** What survey is it? Self-developed? Who developed/reviewed? The survey was self-developed	☑ Scores collected for individual teachers from pre intervention confidence surveys	☑ Scores collected for individual teachers from post intervention confidence surveys after Yr1 and Yr2 of intervention ☑ Interviews/ focus group of sample of survey respondents to moderate survey findings Who will facilitate this? How many participants to do expect? When will this happen? Sample size? Sampling method? I will conduct a focus group in the final cluster meeting with the 8 key participants to unpick the impact further.
	☑ Delivery of higher quality teaching including subject-focused and teaching methods in what subject? Specific key stages/years? Year 6 Maths teaching	☑ Improved teaching performance in observed lessons[iii] Observations to be conducted for a sample of teachers. With a small sample of those to be independently moderated[iv] Who is conducting/moderating these observations? When will they take place? What sample size are you using? The head teachers from the schools will conduct the observations. They will take place in the summer term. The 8 key participants will be observed.	☑ Standards collected for individual teachers from pre intervention observations (i.e. percentages of teachers at each level)	☑ Standards collected for individual teachers from observations after Yr1 and Yr2 of intervention

	Outcomes	Indicators	Baseline data collection[i]	Impact data collection[ii]
	☑ Use of better subject-specific resources What kinds of resources? For what subjects? Specific years/ key stages? Maths KS2/KS3 (aimed at more able year 6 mathematicians). The resources are specifically aimed at developing pupil's reasoning, problem solving and mathematical communication.	☑ Development of better subject specific resources In what way(s) are you expecting these resources to be better? The resources will allow teachers to provide pupils with opportunities for deeper, more challenging learning to extend their knowledge, skills and abilities.	☑ Launch date of new resources	☑ Use of new subject specific resources in lessons (through lesson observations or work scrutiny). Usage analysed against performance in observed lessons.

	Outcomes	Indicators	Baseline data collection[i]	Impact data collection[ii]
Pupil outcomes **Sub Groups** The characteristics of the eligible cohort should be analysed across the following sub groups: ☑ LAC continuously for 6 months+ ☑ FSM ☑ FSM at any time during last 6 years* ☑ Disadvantaged pupils ☑ EAL ☑ Gender ☑ Ethnicity ☑ Statement of SEN or supported at School Action Plus ☑ Started respective Key Stage below expected level, at expected level, above expected level All characteristics should be captured as part of establishing the baseline and data should be collected to enable all outcomes to be analysed across these sub groups. **Churn** Throughout the programme thorough records of any "churn" of pupils leaving or joining the intervention group must be kept. In order to do this records must be kept of: ☑ Unique pupil identifier ☑ Engagement date ☑ Disengagement date and reason **Pupil outcomes continued…**	☑ Increased educational attainment and progress In what? Maths in year 6 pupils	☑ Increased attainment (levels and sub levels at KS1-3 and grades at KS4-5) compared against a comparison group[iv] Which? Needs to be project specific Maths levels at the end of KS2 ☑ Increased levels of progress (point scores and % achieving higher point scores than expected) compared against a comparison group[vi] Specific to pupils or generic 3 pts? Pupils will make better than nationally expected (3 pts) progress ☑ Reduced gap between attainment of different sub-groups/disadvantaged groups of pupils (e.g. FSM, LAC, by gender etc.) compared against a comparison group[vi]	☑ Intervention group: assessed level on entry to the programme and for 3 years previous ☑ Comparison group: assessed level on entry to the programme and for 3 years previous ☑ Trend data[v]: Actual attainment (levels/grades) which? for the 3previous year groups which year groups? Maths levels will be measured for year 6 pupils in the previous 3 year 6 cohorts. ☑ Intervention group: estimated point score without intervention ☑ Comparison group: estimated point score without intervention ☑ Intervention group: in house % points gaps between relative attainment of sub groups pre intervention and for 3 years previous ☑ Comparison group: in house % points gaps between relative attainment of sub groups pre intervention and for 3 years previous ☑ Trend data: in house % points gaps between relative attainment of sub groups for the 3previous year groups	☑ Intervention group: actual pupil attainment levels after intervention ☑ Comparison group: actual pupil attainment levels after intervention Where attainment is based on teacher assessments (i.e. not at the end of a KS) a sample of pupil assessments should be independently moderated[iv] What assessments are you using? If teachers', who will moderate? This will be mostly based on teacher assessment, but will also include end of KS2 test results. Currently there is no provision to moderate teacher assessment levels. We did not anticipate the need to do this and consequently have not planned or budgeted for this provision! ☑ Intervention group: difference between actual attainment and expected attainment (without intervention) ☑ Comparison group: difference between actual attainment and expected attainment (without intervention) ☑ Intervention group: in house % points gaps between relative performance of sub groups after intervention ☑ Comparison group: in house % points gaps between relative performance of sub groups after intervention

	Outcomes	Indicators	Baseline data collection[i]	Impact data collection[ii]
School system outcomes	☑ Teachers/ schools **involved in intervention** making greater use of networks, other schools and colleagues to improve subject knowledge and teaching practice	☑ Increased number of teachers who are able to extend network i.e. through 'cascading' training/ support	☑ Number of staff trained/ able to support & extend networks pre intervention How will their ability be assessed? When? The initial cluster of 8 staff will join the project facilitator in delivering whole school training (spring term 2014). The final cluster training (summer 2014) will include an element of ensuring the 8 project teachers are able to continue to deliver the project's key messages beyond this academic year.	☑ Number of staff trained/ able to support & extend networks after Y1 and Y2 of intervention When will this be assessed? At the end of Y1 and Y2 of intervention.

[i] **Baseline data** should be captured just before engagement with the programme intervention. Programmes may therefore simply require one round of baseline data collection at the beginning of the programme. However, where the programme implements a staggered engagement of groups, a baseline will need to be conducted for each group just before they engage with the intervention.
[ii] **Impact data** should be analysed after Y1 and Y2 of the intervention as a minimum.
[iii] **Observations** could be conducted using a peer-to-peer approach or by external evaluators (may be 'subject leads'). If a peer-to-peer approach was taken it would be preferred if an external evaluator moderated a sample and that peer observations were conducted between different schools (i.e. teachers from one school observe a different school) rather than by colleagues from the same school.
[iv] **Comparison groups** could be a randomised control group (preferred if possible), such as a cluster randomisation, or a matched comparison group. It should be the same size as the intervention group and should measure all outcomes in the same way. Please see the Glossary for additional explanation of comparison groups.
[v] **Trend data** is designed to show results of the intervention groups in the context of year on year fluctuation in attainment of different year groups. Trend data should be collected for the 3 previous year groups for the 3 years previous to the age of the intervention group as well as the 2 years when the cohort was the same age as the intervention group. I.e. of the programme is looking at year 6 and 7 starting with year 6s in year 1 then trend data should be collected for the current year 7, 8 and 9 for the years when they were in year 3, 4, 5, 6 and 7. This can then be compared to intervention and comparison group data which will also be collected for 3 years previous to the intervention (years 3-5) as well as the intervention (years 6-7).