# Best Practice Network school improvement library

## To improve the percentage of pupils attaining greater depth in maths across the school

### Headteacher, Primary, West Midland

Tags: Maths, Primary, Greater depth

### The issue

* Underperformance of pupils in Year 6 at greater depth level when compared to pupils nationally
* Poor maths progress data at the end of Year 6
* Low numbers of pupils attaining greater depth throughout the school
* Previous poor maths leadership

In order to identify and analyse the external and strategic environment in relation to my school, I used the PESTLE tool. This showed me St James’ is lacking in political and environmental aspects. This was raised and discussed with Governors and SLT Members. We are a LA school, in a local authority that is diminishing due to budget restraints. It is highly likely that we will need to convert to an academy and join a local MAT or set up one of our own. It also means initially, informal collaboration needs to be sought in order to identify successful links that could be made more formal in the future. This means that more links need to be created, starting with links for the new subject coordinator, which would help with maths, a large focus area for us this Year. Analysis using the PESTLE tool also identified that in economic terms we as a school, have a good surplus of money, which allows us some freedom to target pupils to make rapid progress. This means a larger amount of money than previously given could be targeted towards maths.

The DFE comparison tool of local primary schools with a similar context, showed that our reading and writing results where inline or higher than other schools. However our maths progress was below that of schools similar to us and those in the local area and so was the percentage of children reaching the higher standard in reading, writing and maths. Further analysis of the ASP from last year shows maths was the weakest subject overall and those attaining GDS was lower than national. The average progress for maths was -2.5. Further analysis of individual data showed that those pupils attaining a level 3 in KS1 SATS were not attaining GDS is Year 6. Deeper analysis of internal data at a whole cohort and individual level also shows weakness in maths GDS across most year groups. This raised two problems overall one was not enough children were achieving greater depth in maths and those pupils who got a level 3 in KS1 were not making sufficient progress to attain greater depth by the end of Year 6. Investigation of KS2 test papers and monitoring of pupil’s maths books showed that children were not being exposed to challenging maths reasoning activities throughout KS2 and a lack of monitoring from the previous maths leaders had not highlighted this soon enough.

### The solution

* Regular monitoring and analysis of data to inform targeted intervention and CPD strategy
* Exploited challenge and support from governors
* Worked closely with Maths Link Governor
* Created strong links for the Maths Leader to network with other key professionals
* Exploited expertise of Maths Leader from local university
* Organised workshops for parents on supporting children with greater depth maths
* Developed research and evidence informed programme pf sustained CPD using a lesson study approach
* Conducted teacher audit and reviewed maths teaching
* Arranged for the Maths Leader to provide extra monitoring and support with planning for struggling teachers
* Scrutinised pupil books and test papers
* Reformed maths curriculum to teach less in greater depth through challenging reasoning and problem-solving activities

Once initial data analysis had taken place with myself and SLT, I presented data and initial plans to the Chair of Governors and the Maths Link Governor. This meeting was used to share data and discuss initial ideas. This was a useful meeting as both governors were challenging about what has previously happened in maths leadership and the subject in general to result in this data. It was also useful as the Maths Link Governor was keen to be involved in all stages of the project plan. This was useful to know when drafting the action plan. After this, I formed a plan for improvement of maths greater depth data and subject leadership. I presented this to the whole Governing Board and sought feedback. All governors agreed with the plan and actions but challenged me on the specificity of the links for the maths leader. I clarified that these would be with other local school and the University of Worcester. I also shared the context for creating links with the current academy and MAT agenda. Presenting to the Governing Body was a beneficial exercise because they were then fully informed about the project and emerging area for development in maths. It was also useful when they challenged me wanting clarification as this showed me I needed to be more specific on my plan, especially in my success criteria and mile stones.

I based my project action plan around the ten commandments of change leadership, as research proved that if one of these aspects was lacking the project was likely to fail. Some of the most pertinent aspects of the ten commandments and those most applicable to my project were: ‘an accepted need to change’, this was clear in the first governor presentation, SLT meeting and CPD session for staff. By sharing data and evidence from books, all stakeholders were able to see there was a need for change; ‘a viable vision/alternative state’, a clear vision was created first by setting an end goal attainment target for GDS maths across the school, staff and governors were clear on the vision after initial discussion of actions, miles stones and success criteria from the project action plan; ‘sponsorship from above’, governor involvement would be crucial from the outset. Staff awareness of governor input and involvement would give onus to the importance of the project and the backing of resources needed; ‘realistic scale and pace of change’, I made staff aware after initial challenge that this was not a week-long project where teachers were told what to implement and no follow up would occur. Instead this would be a year-long project initially with regular follow up and review and extension if needed; and finally ‘a plan for likely resistance and ‘constant advocacy’, regular CPD sessions based on teacher feedback and regular meetings with the Maths Link Governor would ensure staff know that their views were important and would be heard and listened to .

Research that resonated with me and influenced my planning of the project was around effective CPD and deeper maths learning. From monitoring and analysis of books and CPD, these seemed to be part of the issue resulting in low maths progress and children not achieving greater depth. Research showed that CPD delivered over a short amount of time was ineffective. After reading this research and looking through the results of my teacher’s maths skills audit, it was clear my plan needed to incorporate sustained CPD over the year, which allowed teachers to learn from each other and clarify what greater depth learning looked like. This took on the form of the lesson study approach, which involved teachers having regular input from experts, learning from each other, studying research and presenting their results over the course of three terms. Our maths curriculum needed to be reviewed and changed to ensure pupils were taught less at a deeper level. Pupils needed to be able to apply skills, learning to problem solve and reason with numbers.

Data analysis clearly shows that an insufficient number of pupils are making adequate progress in maths. On deeper analysis, pupils who achieved a level 3 in KS1 were not achieving greater depth in maths at the end of year 6 therefore having a negative impact on the overall progress figures. Monitoring of books and test papers showed that pupils lacked the skills needed to solve problems and reason with numbers. This was due to a lack of diet of rich problem-solving opportunities and learning at a deeper level without moving on prematurely. Review of teacher audits showed they did not clearly understand what greater depth maths looked like and what they should provide children with. This was due to ineffective CPD and a lack of time given to sustained maths CPD. Issues in previous maths monitoring and the previous maths leader leaving the school meant a strong focus also needed to be on the leadership of maths across the school. My project hads a strong focus on maths leadership, including creating strong links for the Maths Leader to network with other key professionals, with a focus on greater depth. It also provides rich opportunities for teacher CPD over an extended period of time in the form of a lesson study. Parent maths sessions with a focus on greater depth, were held to ensure parents could support children at home with homework and revision. A thorough curriculum review and implementation of a deeper learning problem solving, and reasoning approach would ensure pupils are receiving the opportunity for learning on a deeper level.

Within my plan, stakeholders at all levels were involved in ensuring children make better progress in maths. Regular meetings with the Maths Leaders, Link Governor, Chair of Governors and teachers were planned in.

‘Leading from good to be great does not mean coming up with the answers and then motivating everyone to follow your messianic vision. It means having the humility to grasp the fact that you do not yet understand enough to have the answers and then ask the questions that will lead to the best possible insights’. This insight influenced the way I ran the feedback sessions with the Maths Leader and Maths Link Governor: in the form of posing questions to gain insight into what was happening in maths and to gauge the progress we were making. It also majorly influenced the way the lesson study CPD approach was formed. Throughout the lesson study teachers were given the opportunity to pose questions and investigate them. They were also able to give honest feedback that was listened to and acted upon. Especially in the skills audit where they said they did not know what greater depth maths looked like. This was then the over–arching focus of the lesson study.

To ensure my project was successful I developed a communication engagement stakeholder strategy and a communication strategy for my school in relation to maths. The best forms of communication for this projects were: briefings and presentations, these could be used to inform staff and governors of the key actions of the project and for CPD; public displays, these were already used in school and could be utilised to let parents know about maths meetings for parents; the school newsletters and website; any sessions for parents could be advertised using these weekly forms of communication ; and workshops for parents on supporting children with greater depth maths.

As a Local Authority School with a dwindling school advisory team, it was vital we created links. As an Acting Headteacher, I attended monthly Headteacher workshops with Heads from other schools. We also linked with another school for writing moderation. During the school year, the Literacy Leader attended network meetings through our cluster schools but also with the University Worcester. There were however no current links for maths across the schools. As part of this project I recognised how important it was to set up links with other schools for maths. Preparing a partnership map allowed me to explore the benefits of different partnerships and choose the best ones for this project and the school. This would not only benefit the new Maths Leader but could be the catalyst for more formal working relationships in the future. Talking to other Heads, I was able to find two other schools who needed to work on aspects of maths at greater depth. The maths leaders from all three schools set up a monthly meeting to discuss this topic. I also arranged for my Math Leader to attend the University of Worcester maths coordinator meetings that are held every two months.

The Maths Leader, the Maths Link Governor and myself met each month to discuss the progress of the project. The Maths Link Governor found it useful to be involved in each stage. She found looking at the initial curriculum review useful as this showed the gaps in the curriculum. This enabled her to challenge the Maths Leader and myself on the progress of the new more challenging maths material being carried out by pupils. The Maths Link Governor also attended each meeting for parents, led by the Maths Leader. She used this as an opportunity to discuss parent perception of maths, which was extremely positive after each session. At the full Governor meeting, held each half term, her subject report was shared, meaning progress was shared with the full governing board. Each term governors meet with senior leaders and are presented with termly internal data. The Maths Link Governor is also part of this so was able to analyse, discuss and challenge on the progress of the project through data analysis.

As mentioned above, I based my project around the ten commandments of leadership change. Some of these proved more difficult than others when dealing with staff. Ensuring staff were aware of the need to change maths was difficult. Some practitioners felt their progress was good in individual classes but failed to see the whole school picture. I decided to meet with these teachers individually before the initial presentation to share context and highlight to them there was a need to change. This worked well on a 1:1 basis as lots of questions were asked and discussed. I then presented the project to the whole staff team. The teachers who had met with me initially 1:1, who were originally opposed to change, then led the discussions and helped to show others that we needed to try something new. Before meeting with staff, I had read the research around emotional intelligence and could see how important this was when dealing with staff who were reluctant to change. This helped me to hold difficult conversations with the three staff members I met with 1:1. All staff members thanked me for the meetings and one of them commented that they felt really listened to and valued.

Autumn data showed that progress in maths was strong. Focussing down on pupils who should achieve GDS showed that in nearly all year groups the pupils were on task. However, in two year groups, data showed some pupils were not on track to achieve GDS. I instructed the Maths Leader to carry out a book scrutiny of all year groups. After this, it was evident that the pupils making good progress had been carrying out challenging reasoning and problem-solving activities based on maths assessment. This was allowing them to gain a deeper knowledge of subject content and ensuring they made better progress. In the year groups where progress was lower, fewer reasoning and problem-solving activities were happening. Through discussion with the teachers, it was clear to see that they still lacked confidence in planning based on a rich reasoning and problem-solving approach. The CPD that had run for the autumn term had been successful with the other five teachers but now needed to be more tailored to meet the teacher’s needs, who were still having difficulties. I instructed the Maths Leader to plan with both teachers and then monitor them on a two-weekly basis in lessons. When analysing the internal data for spring, strong progress was seen across all year groups. The individual CPD had been effective for the two teachers who were initially struggling. Teacher feedback in questionnaires was positive and continuously mentioned their increased confidence in planning for GDS pupils and recognising what GD looked like.

The whole school data analysis I carry out each term, identifies all vulnerable groups across the school. It is clear to see on deeper analysis that all groups were making good progress except for those who should be targeted for greater depth based on their KS1 results. This was the basis of my project. The data analysis carried out throughout my project, not only focussed on GDS pupils, although these were the primary focus, but all other groups. All pupils were discussed and monitored. Altering the maths curriculum and providing rich CPD delivered to staff, clearly had an impact on all pupil results, which is reflected in the end of year data.

After reviewing the DFE pamphlet on reducing teacher workload (DFE, 2017), I was able to see that there were two possible areas of my project that could increase teacher workload. These were in planning for the new more problem solving and reasoning approach, which could potentially be more time consuming initially. The other was a potential to increase the collection of data from teachers based on this project. Within the planning stage, regular sessions (included in the CPD) were taken to gain teacher feedback on workload. In one session, I gave out the Guardian article on reducing teacher workload. Teachers found this useful to review with SLT and found that by sharing ideas for efficient marking and planning they were able to be more efficient with workload. Through the lesson study approach of CPD, teachers planned lessons together. This collaborative approach meant through more detailed discussion and understanding of the reasoning and problem-solving approach, less time was taken to plan for it over the course of the three terms as teachers eventually became more confident with planning this way. Lastly the data analysed for this project was the termly data already collected by teachers. After one discussion meeting, using the DFE pamphlet. It was clear that we as a staff only collected the essential data and were not doubling up on collection.

Some aspects of my Communication Engagement Strategy worked better than others. The presentations and briefings were effective in communicating the need to change and to share the project with staff and governors. This form of communication enabled me to target all governors and all staff rather than on an individual basis. The workshops for parents were also extremely successful. Parental feedback and that of the Maths Link Governor were extremely positive and gains in knowledge and confidence for parents to work with their child at home were evident. However, other parental feedback, in regard to communication methods, showed that the posters advertising the workshops were not as effective as not all parents saw these if they did not collect/drop off their child, or if they did not stand in the vicinity of the notice board. More effective communication regarding workshops was by text or email to parents. This showed me that in future, all details about sessions for parents and other meetings need to be sent by text to parents in advance, not just put on the school notice board.

Both partnerships proved very successful. In SLT and feedback meetings the Maths Leader discussed her increased confidence as a result of working with colleagues from other local schools. Results from the CPD/lesson study were very positive and one of the bi-products of this was question prompts for GDS children to use in explanations of reasoning. These had been shared by my Math Leader at the new cluster meeting and were now being used in the three other schools. The cluster meeting is now going to carry on with a different focus each term. The other partnership developed over this project was with the University of Worcester. With diminishing Local Authority maths subject courses/meetings, my maths leader found the CPD/meeting sessions useful for subject knowledge and gaining insight into different teaching strategies. Two of the strategies shared in CPD sessions were from the University of Worcester Maths Subject Leader Meetings.

 My initial school Sponsor was taken on as my mentor through my Acting Headship. After seeing the results of the maths project undertaken, he asked us to support two of his other schools with maths. So far, 7 teachers from other schools have come to observe my teachers teaching maths using the more problem solving and reasoning approach as well as using many strategies and products of the CPD/lesson study with children.

During the Autumn term (2018), my Maths Leader went to another local primary school to support their Maths Leader on subject leadership, curriculum and monitoring. Feedback from the school’s Headteacher has been extremely positive. The whole school project was excellent CPD and leadership training for my new Maths Leader, who is now far more competent and confident in leading maths successfully.

### Impact

To analyse the impact of this project the following methods were carried out: thorough data analysis was carried out, focusing on maths progress of the whole school, individual classes and individual pupils; monitoring of learning in maths books was carried out by SLT in the form of a book scrutiny and lesson observations; and verbal and written feedback was collected from teachers relating to CPD/lesson study impact. All data was shared with the Standards Committee, which was then presented to the full Governing Body. A final staff meeting was used to share final results with teachers, celebrate their success and share points to continue going forward.

Year 6 SATS data showed vast improvement in both the percentages of children achieving the expected standard and that of greater depth. The overall progress of pupils since KS1 increased to a positive figure. 100% of pupil premium children achieved the expected standard in maths.

The percentage of children achieving the expected standard in maths was 87% compared to 71% in 2017. 37% of pupil achieved GDS in maths compared to 10% in 2017 and 23% nationally. Progress for maths overall was +2.4 compared to last year’s -2.5.