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| Lesson Study : Case Report Belfield Community School |
| **Title of case study**  *Using Lesson study to develop teaching approaches for girls who are quiet and lack confidence in Mathematics* |
| **Who might find this case report useful?** *KS1 ans KS2 teachers . Maths teachers*  |
| **Key points:** * Why won’t girls join in?
* Strategies to increase confidence and participation
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| Names and usual roles and contact details of LS group membersHelen Brougham, Deputy Headteacher and Numbers Count Teacher, Belfield Community School hbrougham@belfield.rochdale.sch.ukRachel Lockley, Y4 teacher Belfield Community SchoolClare Welbourne Y3 teacher, Belfield Community School |
| Section A: Context and overall aims (250 words)*Belfield Community School is situated in an area of high deprivation, 49.8% of children are eligible for free school meals. 73% of children speak English as an additional language. The school wants all its pupils to be independent learners , enjoy learning and know what to do in order to improve. Our curriculum is organised so that Maths and Literacy are taught in the mornings, with topic work, science, French, RE , PE in the afternoons. There are several intervention groups running across the school to accelerate progress in maths, reading, writing and also groups to support children with social, emotional or behavioural difficulties. Pupil progress meetings take place every 6 weeks and intervention groups are adjusted accordingly.* *Our lesson study group consists of Miss Lockley a Y4 teacher with 4 years teaching experience and who has recently been awarded a Masters in Education. Mrs Clare Welbourne a Y3 teacher with 12 years teaching experience and an extensive knowledge of special needs having been a SENCO for 3 years. Helen Brougham is the Deputy Headteacher with 14 years teaching experience and is a Numbers Count teacher.* |
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| **Section B. Aims of the LS, class(es) and case pupils you worked with** |
| This lesson study was conducted in a Year 4 mixed ability maths class. Data showed that a group of quieter girls were not making as much progress as their peers. The girls were making more rapid progress in other areas of the curriculum. Some of the girls are EAL learners, and the teachers considered if this was an issue in accessing the maths curriculum. The areas of maths they found most challenging were using and applying ‘word problems’. This would be understandable for EAL learners , but not all of the quiet group were in fact EAL learners. We wanted to improve the way these quiet girls learn how to solve and explain word problems.* We considered the Haylock and Cockburn (1989)Connections Model and the work of **Dr Janet Collins;** *Playing Truant in Mind: The social exclusion of quiet children*
* Talking to learn- Dialogic teaching

magazine article | Published in TES Newspaper on 30 January, 2004 **| By: Robin Alexander**And how this information could help us improve the way the quiet girls learn how to solve mathematical word problems.Case PupilsLC-(non EAL)3c maths SA-(EAL) 3a maths |
| Section C: Your first research lesson1)  |
| * *We wanted the quiet girls to have the skills and confidence to explain to the whole class how they had solved a maths problem.*
* *The lesson was designed to get the pupils to think how word problems are constructed, correct use of mathematical vocabulary, use of apparatus as an aid to solve and explain solutions and success criteria. The lesson had the opportunity to rehearse vocabulary in small groups / or with talk partners. The pupils were not expected to solve the problems in this lesson (to lessen anxiety)*
* *Helen taught the lesson. Clare and Rachel observed LC and SA throughout the lesson.*
* *The case study pupils both displayed behaviour that indicated lack of confidence and unease. Whispering responses, hiding her mouth behind her hair. Not joining in with whole class counting, only answering questions that were directed at them. Avoiding eye contact with the teacher. In the group work part of the lesson let other pupils interrupt them, take equipment from them. Once SA had seen another pupil solve one example gained more confidence and began to join in. When LC was asked directly by the teacher to say a number story to the group she did so. Other than this the girls were very passive.*
* *In the plenary the pupils were asked to write down calculations(not solutions) that corresponded to number stories the pupils had written. LC volunteered to read out her number sentence to the class (the one she had read to the group) SA didn’t write a response and shook her head when asked to share her idea. She eventually wrote down an idea that has been thought of by the group. SA didn’t seem to take any cues from the group it was difficult to tell if she was engaged at all.*
* *The case study pupils were passive unless asked directly, they responded to examples from pupils and the teacher, they like the security of a group and the time to practise before committing to an answer in front of their peers. They did not ask for help if they didn’t understand and employed ‘hiding’ strategies.*
* *During the pupil interviews LC revealed that she had learned new vocabulary, understood what a number story was. She said it was difficult to think of her own number story until she had seen an example from the teacher and group, she said she would like the teacher to give some ideas for the context of number stories, for example shopping. She said she was proud of herself for coming to the front to read out her number story. She explained how equipment had helped her and talking to a partner had helped with ideas.*

*SA said she had learned new words and the vocabulary part of the lesson had helped. She revealed that she worries about getting things wrong, she knew to ask the teacher for help and said examples had been helpful, but she wanted more and wanted reassurance that the teacher would help with the calculating part.* |
| Section D: Your second research lesson (RL2) – planning, delivery, observations and analysis meeting  |
| * *The teacher wanted the pupils to learn how to explain how they had solved a problem and use equipment/ vocabulary*
* *During lesson one it was noted how inactive the subject pupils were, they had asked for more examples from the teacher, they liked having free access to maths equipment such as Numicon and Diennes. Equipment was freely available, pupils were encouraged to draw out ideas, use equipment, talk to partners. It was noted that only direct questions elicited responses and that thinking time was important. Vocabulary support and time to rehearse using vocabulary was also built into the lesson. In this lesson it was planned that the teacher was going to visit each group and not sit with the subject’s group.*
* *Helen Brougham taught whilst Rachel and Clare observed*
* *During the mental and oral starter LC responded well and joined in , even volunteering. SA started off smiling but got some vocabulary mixed up and then began to opt out shaking her head when asked if she would like to share her groups answer.*
* *During group work both pupils were silent and LC worked quietly on her own, unless there had been observers it would have looked like all the group members were working together. Other group members did not try and include them, at one point LC could not have seen the resources as the group were crowding around, she didn’t say anything and none of the group members seemed to notice her difficulty.*
* *When the T visited the table and discussed the problems the subjects became more active, but still quieter than other group members. During the discussion LC had her hand raised slightly but this was not seen by the teacher. Both subject pupils did answer questions using equipment and were asked if they would share during the plenary.*
* *By the end of the lesson the subject pupils had gained enough confidence to speak out in class and explain their group/ own ideas*
* *in the pupil interviews LC said“I was proud of going to the front and reading stuff out because I was a bit shy”*

*SA said“I used the equipment really well today and I stood up in front of the class and showed what I had done”* |
| Section E: Your third research lesson (RL3) – planning, delivery, observations and analysis meeting  |
| *To solve word problems using ‘RUCSAC’** *The teacher to give ideas in different contexts*
* *to give thinking / rehearsal time/ vocabulary reminders & support*
* *insist on answers and full explanations using equipment/models/images*
* *The majority of pupils in the class were now more confident with the vocabulary and knew they were expected to use equipment/ draw models/ images to help their thinking. Both subject pupils did join in with discussing, but only when prompted by the teacher, for example LC was reading one of the questions cards in her head, the teacher needed to point out that she needed to read aloud in order to share it with her group/ partner. SA was still showing ‘cover up’ behaviour. She took a set of cards and spread them out , read them , but passed them on without attempting to solve or seek help from the group. When the teacher intervened she could say what the key word was.*
* *The subject pupils used equipment and drew images to help their thinking. LC drew dot arrays and used a times table grid. SA was lost at one point, she had written 12x3 but didn’t seem to know what to do next. She looked at what other pupils were doing, but didn’t speak or ask for help. When the teacher asked her if she understood she said yes, even though she didn’t. When questioned and asked what equipment might help her solve the problem she used Numicon, but was very hesitant and needed constant feedback that she was on the right track. Both pupils contributed well to the plenary, engineered so they would speak last having heard some good examples first.*
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| Section F Impact on pupil learning and progress  |
| *During the course of the three lessons , the teaching emphasised use of correct vocabulary, insisted on equipment , models / images being used. Also insisting quiet pupils pushed themselves and contribute at least to the plenary. I think there were two issues at work with the case pupils, difficulty with mathematical language (EAL issue) and confidence. LC is quiet in all aspects of school work , whilst SA is a different child in the playground and in other subjects. Having ‘permission’ to use models, images and equipment gave the subject pupils something to illustrate their explanations and hopefully made connections in their thinking. For children who are quiet (LC) the models gave her prompts, and a different way of communicating her thoughts, she explained in the pupil interviews that she liked using the equipment and she was proud of speaking out in class. SA also spoke out in class but there was not a great deal of understanding beneath it. It has helped her confidence in the short term and having models and images has served as vocabulary reminders, and helped her make connections with calculations.**In conclusion quiet pupils who lack confidence to speak in maths lessons who have regular access to models and images and are given opportunities to draw annotations develop confidence and understanding.**SA- When asked if she found anything tricky she said- “Solving problems, but when we were given equipment it was easy.”* |
| Section G Impact on practice and future teaching  |
| * All children to have a ruled off space in their daily maths work for informal jottings (not marked)
* Opportunities for all children to explain their work using models and images to support them.
* Maths equipment out for every lesson.
* High expectations on correct use of vocabulary- staff to be excellent models.

Specific intervention for EAL. |
| Section H: Impact on departmental and school approaches to teaching, learning, supporting pupils with learning difficulties, and CPD.  |
| * *School calculation policy / end of year expectations to be updated to include children demonstrating understanding using equipment/models/ images*
* *Staff CPD feedback on lesson study*
* *Staff CPD on involving quiet children, it was shocking to find out the avoidance strategies pupils can subtlety employ and give teachers a false impression of their progress during lessons*
* *Developing the pupil’s skills in working in a group- collaborative learning*

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| Section I: Personal reflections  |
| *I enjoyed the lesson study process and it was an excellent opportunity to share ideas with experienced members of staff. The opportunity to try new teaching strategies along with colleague through joint planning. I was amazed at how much I learned from observing one child’s learning journey during my times as an observer. The lesson study process allowed me to discover details about each child and how they learn. I would recommend lesson study to every teacher.* |