

# Involving parents in secondary mathematics: case studies A-E





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# Case study A

## A workshop for parents of Year 7 pupils

The example is from an 11–18 mixed comprehensive on the south coast of England. In 2008, just over 30% of students at the school achieved 5+ A\*–C grades at GCSE including English and mathematics.

### Background

The teachers in the mathematics department were keen to participate in the parents' pilot project as they felt that many pupils – and their parents – had negative views of mathematics. The subject leader wanted to help parents to feel more confident about supporting their children with homework and with discussing mathematics and the ways that it is used in everyday life. She also saw this as a way of raising aspirations, and she believed that if the parents felt more confident then the children would take mathematics more seriously and want to study it at higher levels.

### Planning the workshop

The department ensured that the senior leadership team was supportive of this initiative from the outset and decided to target one Year 7 class for the first workshop. The teachers decided to hold the session in the library for two hours at the start of the morning with a working coffee break within the session. Letters were posted home and a teaching assistant followed these up with telephone calls to remind the parents to return the reply slip. The Year 7 mathematics teacher discussed the forthcoming session with the class to stimulate interest and ensure that they encouraged a parent to attend.

### On the day

Three members of the department worked with the LA consultant to choose practical and engaging activities for the workshop. They included a range of mathematical games, puzzles, visualisations and practical group work activities. The session was led by the subject leader with the other two teachers introducing some activities. The department presented a certificate for parents and a games package to take away to enable the lively discussion that had taken place to continue at home.

There was 70% attendance by parents and the feedback was very positive. The parents valued the opportunity to work collaboratively with their own children and many went away thinking that mathematics was fun and not always 'difficult'. Pupils and parents gained an insight into each other's ability and how, by approaching activities in a logical and systematic way, they could tackle problems and find solutions more effectively.

### Follow-up

The teachers report that there is now a definite 'buzz' when Year 7 are taught in the department and lots of pupils in other groups have asked when their own parents can attend a workshop. Pupils who took part in the first one are asking when it can be repeated!

By attending the workshop and working with their children, parents become more aware of how mathematics is taught in school. Several parents have since commented that their mathematical confidence improved and that they were better able to support their children in mathematics. Working

together built trust, respect and confidence and was enjoyable and satisfying for all concerned.

Further sessions for the other Year 7 groups are being organised. Other members of the department are now being involved in the planning and running of these sessions for their own teaching groups.

## Feedback

Comments were collected from teachers, parents and pupils.

### Parents said:

- Excellent idea and there should be far more of this with other subjects.
- Perfect for parent and child to work together.
- Educational and enjoyable. An insight into the educational process today.
- I thought it was very good and challenging for parents.
- Enjoyed the whole session and I do not normally enjoy mathematics! Thanks.
- A good idea. Could be done a few times a year.
- Can I take the resources home?
- We should do more of this together (parent and child).
- I enjoyed the session, as it is rare to spend time alone with my daughter concentrating on an activity together.
- I really enjoyed that, it was great, now I am off to dig up the road on the seafront.

### Pupils said:

- I liked it because I got to show my mum my mathematics skills and work with her.
- Good but challenging at times.
- I liked all the puzzles and the stuff I did with my mum.
- Good fun!

### Teachers said:

- I was nervous before we started but I really enjoyed that, it was fascinating to see the interactions between the pupils and their parents.
- It was lovely to hear the buzz of mathematical discussion throughout the room.
- It was really interesting to see the way that one pupil and his father were deep in discussion about the mathematics in the activities.

# Case study B

## A workshop for parents of Year 7 pupils

This parents' workshop took place in a mixed comprehensive school in the south-west of England. The workshop features in the video material available on the accompanying DVD and website.

Many of the teachers and senior leaders in the school were keen to explore opportunities to increase parental engagement with their children's mathematics. Year 7 seemed a good year group to start with, providing parents with a friendly and informal opportunity to familiarise them with the school, and allowing teachers to demonstrate some of the activities and learning styles encountered within lessons.

The head of department oversaw the project, with another member of the department taking the lead responsibility for practical arrangements. Initial discussions involved the senior leadership team, and centred on practical arrangements (such as agreeing a date and venue), and deciding the purpose and content of the workshop.

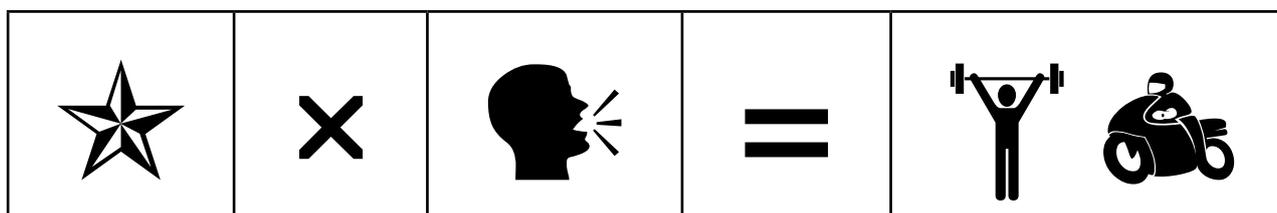
The department decided that activities should be chosen specifically to encourage parents and their children to work collaboratively in developing problem-solving strategies. The teachers agreed that it was important to provide an enjoyable but challenging experience, and build mathematical confidence for all of the participants. Every member of the department was involved in the planning, and suggested ideas for the workshop. The lead teacher made a final selection and drew up the workshop programme.

A date was set, and (after some discussion) it was agreed to hold the workshop in the morning, though allowing time for parents to drop younger children off at local primary schools. A suitable venue (the school's drama studio) was selected and booked. The teachers then started to plan each stage of the event, from the moment the parents entered the school premises to the time they left. The roles and responsibilities of the various people involved in the organisation of the event were agreed. The school's administrative staff team played a vital role in the production and distribution of invitations, as well as collating responses and making follow-up telephone calls. There was excellent communication at all levels and a real feeling of teamwork and excitement!

Upon arrival on the morning of the workshop, the parents were greeted and signed in at the school reception and then escorted to the drama studio. The pupils were already seated, eagerly waiting for their parents to arrive and join them. The seating plan was carefully set up in advance, helping the event to get off to a smooth start. Pupils whose parents were unable to attend were paired together. Tables were organised to facilitate group work, while also ensuring that all participants had a clear view of the presenters at the front of the room. The starter activity, a simple geometric puzzle, was projected onto the board with clear, easy to follow instructions. This helped to provide an initial focus, allowing all of the groups to settle as the parents arrived.

Because of the focus on maximising dialogue between the pairs, instructions and explanations from presenters were kept to a minimum. Some participants were a little apprehensive at first, but the room soon buzzed with noise and conversation.

One of the most successful activities was a version of 'which times table' (see below).



Although prior knowledge of multiplication tables was useful in this activity, the development of a strategic approach to the problem was the most important aspect. As the arithmetic was not a barrier, all participants could feel confident in participating and sharing their ideas. Those who completed the task ahead of others were provided with an alternative times table. It was interesting to see how the strategies developed with the first version of the puzzle were applied again to good effect.

Towards the end of the workshop, feedback from both parents and pupils was collected on sticky notes. Although the workshop had been successful, it was made clear that comments on any areas for improvement would be welcomed. All pupils received a certificate and a task to take home to work on with their parent. Refreshments were then served, providing an opportunity for anyone wishing to stay behind to talk to the staff or other parents.

The lead teacher, head of department and National Strategies Consultant met after the workshop to discuss the feedback and to decide upon future events. It was agreed to run a similar workshop with another Year 7 class, and the possibility of trialling similar workshops within Key Stage 4 was also discussed.

## Participants' comments

### Adults said:

- A lot more fun than I remember maths being.
- I thought today was a lot of fun. I enjoyed seeing how my son works in class.
- Great fun learning maths strategies. Nice to add faces to names.
- It was enjoyable working with my son in a classroom environment.
- Really good fun but learning and interacting with others. Positive for all.
- Makes you think! Fun and educational. Good to see how my daughter works.
- Enjoyed it! We all used our brains and had fun at the same time.
- Should be more workshops with parents/children.
- I really enjoyed the maths workshop and I'm pleased that my daughter now knows that I can do maths – and that I know what I'm talking about!
- Enjoyable but challenging. Good to see what my child will be learning so I can assist.
- This workshop has been fun. I spent one-on-one time with my child and in a good group with lots of people. Thank you.
- It was great to learn together. Very interesting. Some good ideas to help the children do maths at home.

### Pupils said:

- It has been fun and different.
- I enjoyed the tables cards. Everything was good.
- Fun, enjoyable, not too hard.
- It was fun and kind of hard.
- I think this is a very good workshop because it's for parents and children to have fun while learning.
- I have enjoyed this lesson because it had loads of challenges.

- Good, I have learned a lot more maths. Good for us because it is a good experience for the adults to come in to watch their children do their work.
- I like how we work as a team. And next time maybe we could do some games outside.
- I never realised that my mum was so good at maths – or that maths could be easy and fun.
- It was OK to see my mum and work as a team but I think it would be better if it could be longer.
- I think it is a very good workshop because we solved a lot of problems and I learnt different things.
- I thought it was fun and it was a good morning.
- Enjoyed it. Would like to do it again.

## Case study C

### A workshop for parents of Year 11 GCSE Grade C/D borderline students

School C is one of three high schools in a large town on the east coast of England, which work together on school improvement. All are keen to strengthen relationships between the school and parents and also between students and their parents. They are particularly keen to strengthen these relationships in the case of older students, where there is often less direct adult involvement with school work. Teachers in the schools judge that, in many cases, older students are less keen to share their work with their parents at home. All three schools are also aiming to improve the percentage of students achieving 5 A\*–C grades at GCSE including English and mathematics. For all these reasons, the local authority consultant approached School C to suggest running a parents' mathematics workshop, targeting parents of Year 11 students who were currently working near the grade C/D borderline.

The senior leadership team at the school welcomed the idea of the workshops and were supportive throughout the pilot. They were involved in the planning processes and the delivery, as well as buying the refreshments! The head of mathematics was also enthusiastic. At the first planning meeting, one important discussion centred on the choice of activities for the workshop. One suggestion was to focus on activities directly relevant to answering GCSE questions; the suggested alternative was to concentrate on puzzles and games aiming at creating a 'buzz' and sense of fun. After some lively debate, everybody agreed that generating some mathematical fun and enthusiasm should be the priority for the first workshop, but that they could follow this up with one or more subsequent events that were more focused on examinations and revision, as well as some carefully designed homework activities to be shared with parents.

The teachers next considered the venue for the event, and decided that the school library was the best option. The librarian was an enthusiastic supporter of the project, and also provided a crèche so that parents with very young children could participate.

Various options for the timing of the session were considered, and it was decided to invite parents into school for a 9.00am start. A member of the school office staff played a vital role in following up the invitations with telephone calls to parents – this was instrumental in ensuring good attendance.

Parents were met and greeted at the school entrance, and shown to the library where the students were already waiting. A total of 17 students and 15 parents attended. The session lasted for an hour and a half and went very quickly! There was a starter activity on the tables (a variation on 'which times table?') to be solved in pairs, with another, slightly harder version available as an extension. Other activities included a 'think of a number' puzzle and the game of Nim, using counters on the tables as a concrete model for the game. The activities were kept to approximately 15 minutes each, in order to ensure a brisk pace and sustain interest.

The plenary session was an important part of the workshop, providing an opportunity for feedback from students, teachers and parents and helping the school to plan its next steps. Feedback was overwhelmingly positive, although some parents did say that they felt the workshop had come too late. The teachers agreed that starting this process in Year 10 (or earlier) would have huge benefits. They were encouraged to see parents and students working together with obvious enjoyment.

Staff at School C are now planning further events. One interesting view that was expressed was that participating in this sort of event would be excellent experience for new members of staff – helping to organise and run such an event would be a good opportunity to establish positive relationships with students and families.

*'It was good to work together, helping each other and having fun in learning. It was my way of showing her I will help with revision if I can.'*

- Mother of Year 11 girl

*'It's good my mum came. It was fun and now my mum can help me if I need help at home with my revision. It's good to work together.'*

- Year 11 girl

## Case study D

### A Year 7 parents' workshop for more able pupils

School D is a new 11–16 secondary school in the east of England, formed by the merger of two secondary schools with a staged amalgamation for the pupils. In September 2008 all new Year 7 pupils started on a single site.

At the start of the process of planning the school's first parents' workshop, a meeting was held between the local authority advisory officer, the school's headteacher, the school's mathematics advanced skills teacher (AST) and the school's head of mathematics. It was decided that for the first trial that the 40 mathematically most able Year 7 pupils were to be targeted. Year 7 was selected to capitalise and build upon the strong home/school relationships developed by the feeder primary schools, and this choice also fitted in well with the staged amalgamation process. The choice of the most able pupils for the first workshop also supported the development of gifted and talented provision at the school. The school's own research also suggested that the parents of this group of pupils would be very likely to attend a workshop, and the school hoped that their support and comments could be used to help to draw other parents to the workshops to be arranged for later in the year.

The parents of the first group of 40 pupils were invited, in writing, to the initial workshop to be held on a Monday morning from 9.00am until 10:30am in the school's learning resource centre. The invitations were then followed up by telephone calls by the AST and this increased the overall participation rate to 16. The AST led the workshop, supported by the advisory officer, the school's headteacher and a mathematics teaching assistant.

A variety of activities were used which were written specifically to generate discussion between the parents and pupils and included practical activities and open-ended tasks. All groups worked on the same tasks at the same time so feedback could be given and ideas shared during plenary sessions.

The parents who attended were very positive about the event and felt reassured that the mathematics department was being proactive. All of the 40 families invited were asked to complete a questionnaire, part of which was designed to ascertain why some parents had not attended. Only one replied that they had not wanted to participate; all of the others had practical difficulties in attending.

The invited families have now been given follow-up homework activities, which require two people to complete, and these have been well received. There is evidence that a number of the families have attempted a number of additional tasks that have been posted on the school's virtual learning environment, and some parents have contacted the school to give feedback on the material.

The teachers at the school are confident that the project has provided a way of raising the profile of mathematics at the school and has strengthened home/school relationships. A further event for subsequent groups of Year 7 pupils was planned for a few weeks later, with the intention that all Year 7 pupils would have the opportunity to participate during the year. The school is also considering the possibility of organising an additional evening workshop to allow all families to attend.

# Case study E

## A Year 11 C/D borderline workshop

School E is a high school and specialist performing arts college in the north of England. The school chose to run a parents' workshop for Year 11 GCSE grade C/D borderline students. The purpose was to seek active support from parents in ensuring students attained the best possible results in their GCSE mathematics examination.

The parents of approximately 30 identified students were invited in person at the Year 11 parents' evening in early February, with any parents who did not attend the parents' evening contacted by telephone by the subject leader the following day. The target students all came from two key teaching groups, and they were themselves involved in planning the supporting letters of invitation and choosing the style of workshop activities, as well as organising the refreshments and other practical arrangements for the event. The workshop was held over two hours on a Saturday morning in the school hall to cater for a potentially large group of students and their parents.

The department wanted the workshop to be engaging and fun but the staff were also keen to engage with some of the students' areas of weakness. After mock exams the previous term, teachers had used question-level analysis and other evidence to identify curricular targets for all of the students involved. These targets were provided on cards for individuals on arrival. The workshop then started with an introduction and welcome from the subject leader, followed by a mathematical reasoning activity led by the local authority consultant, where parents and students worked together in groups. There was then some direct teacher input on one of the curricular targets that was common to all the students present. The focus of this input was on typical misconceptions and exam techniques. After a refreshment break there was a problem-solving activity for all the participants, before the subject leader gave further input on another shared curricular target. The session ended with the subject leader giving details of dates and content of additional after-school sessions that were available for students to attend depending on their curricular targets. As they left students received a 'goody bag' containing a calculator, geometry set and some practice GCSE papers.

Students responded well to being included in planning the workshop. Parents were appreciative of the school's efforts in supporting their children and of the forthcoming sessions offered to support their children's performance in the GCSE exam. Attendance at these sessions improved in comparison to previous years, and the school attributed this at least partly to the successful experience of the parents' workshop.









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