

Loosen up to become outstanding in mathematics: Allenbourn Middle School

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Brief description

This good practice study is of particular interest to schools where provision and outcomes for pupils in mathematics are already securely good, and where the leadership of the department is aiming for it to become outstanding.

Overview – the school's message

Derek Brooks, headteacher believes resolutely that outstanding learning in mathematics is only possible when pupils and teachers are creative in lessons and see mathematics as a necessary part of their lives. He says: 'There needs to be a passion for getting inside the key ideas ...pupils need to see that mathematics is something that can be argued about and grappled with. This means that we needed to remove some of the traditional constraints that we know can deliver consistently good and better lessons, and allow teachers to take risks.'



Derek Brooks, headteacher

Martin Fitzgerald, mathematics coordinator, is responsible for the work of the team of 12 teachers. He works closely with Derek. He emphasises that the department '... now works at the opposite end of the spectrum from "text-book lessons". The danger with that approach was that pupils seemed to be making secure progress because they became adept at answering the questions, but they were seldom able to make that all-important massive jump when asked to apply their learning in real situations. An over-reliance on textbooks kills any hope of realising high expectations because it leads to pupils becoming dependent on the teacher. We knew we had to move on from that.'

The good practice in detail

Tighten up to become good; loosen up to become outstanding

A few years ago, Allenbourn's mathematics department was enjoying a good level of success, achieved due to tight organisation and clear ambition. But Derek and Martin wanted standards to be outstanding. They decided that, from a position of strength – from being a 'tightly run department' – they had to find the right way of 'loosening up' to achieve outstanding progress for pupils in mathematics.

[James Rielly](#), deputy headteacher, recalls arriving at Allenbourn four years ago from a post as local authority adviser. He reflected on the journey the department has taken over that time and warns against making snap judgments about how it works. 'It takes a short while to get to grips with what the head requires of teachers when he speaks of creativity. For example, he doesn't want teachers arriving at lessons with tightly defined lesson plans. But it isn't that he doesn't want lesson planning – he wants you to have the space to take some risks based on a thorough knowledge of the group, and to get pupils learning mathematics actively and busily, in order to make it outstanding!'

Allenbourn Middle School was judged as outstanding in an [inspection](#) in June 2012. During the visit, inspectors noted the impressive progress made by pupils in mathematics and the obvious enjoyment they took from their mathematics lessons. From the baseline measuring



point in January of Year 5 to the final assessment at the end of Year 8, for the past four years an average of 71% of pupils have made three levels of progress and 17% have made four levels of progress. The proportion achieving Level 6 in the new National Curriculum tests in summer 2012 was twice the national average.

This improvement has been due to the establishment of a strong culture of achievement in the department, and two strategic emphases: very

high expectations of pupils throughout the range of ability, and a strong emphasis on creativity and the use and application of mathematics.

At first sight the department seems to operate surprisingly informally: schemes of work are not lengthy and detailed, specific opportunities to use and apply mathematics are not required at certain points in the year, and there isn't a 'target-driven performance culture'. Many new teachers don't understand this at first, given the school's palpable sense of ambition for its pupils.

Creativity in action: haggling and solving crimes!

Working from that secure starting point four years ago, and with pupil behaviour that was reliably good, the first step was to begin to encourage teachers to try new approaches. The only constraint placed upon staff was that outstanding quality of learning in mathematics in the school was to involve pupils using and applying their learning for the majority of their lessons and, as a part of this, always wanting to 'get right into the corners' of their understanding. They made it clear that this approach wasn't to be reserved for the

occasional lesson – it had to become the way that mathematics is learned and taught throughout the school.

This often meant turning traditional lessons on their head. For example, in a Year 8 lesson on percentage increase and decrease, pupils don't spend any time listening to reminders of the basic ideas about how calculations are done; they move straight into a buying and selling simulation with laminated 'money' and cards representing merchandise in the six 'shops' around the room. Traders are told the cost price of items and set prices; and buyers are encouraged to haggle by requiring percentage reductions. Reductions in prices in multiples of 10% are used initially and it is evident that some pupils can handle the idea quicker than others; it is also clear that those that can't appreciate that understanding how someone can rapidly calculate a 30% reduction on a price of £5 is an important skill! Pupils learn quickly from each other and the lesson gets pacier and more demanding as some begin to demand 35% reductions and more complex discounts. For more complex calculations calculators are allowed, but they have to be used intelligently and this brings in the need to turn percentages into decimals quickly and fluently in order to keep up with the pace of haggling. Throughout, the teacher is closely monitoring pupils' rates of understanding and skill acquisition. The plenaries are short and sharp, focused on specific skills, and are continually ratcheting up expectations. By the end of the lesson, all pupils have developed a 'feel' for the topic and have the capacity to deal with the mathematical concepts confidently and with a fluent recall of knowledge. Just as significantly, they show a rare level of confidence in problem solving.



Similarly, in a Year 5 lesson reinforcing techniques for addition and multiplication, pupils do not spend time responding to a long list of questions from a text book. Instead, it's a game of Cluedo. The various clues around the room require a range of calculations to be made (and checked using an alternative method) and the answers provide pieces of evidence for these young sleuths to identify the killer. (It was Professor Plum!)

....yet a culture of high expectations and close accountability

However, the culture of 'loosening up' in order to be outstanding has very high levels of accountability associated with it.

Target setting and assessment are rigorous. Every pupil is tested on entry to the school in Year 5 using optional National Curriculum tests and these outcomes, together with data from their previous schools are used to define expected outcomes for each point in their four years at the school. Each year's targets reflect the best progress achieved previously, as a new baseline of expectation. Pupils work in ability-based groups (organised independently of other subjects) and are tested termly – again, using optional test papers.

A key difference is, however, that targets are not used as the primary mechanism to drive up achievement. Improvements in achievement are driven by high-quality learning and this is seen to be the responsibility of teachers, using the kind of creative and exciting strategies outlined earlier. This outstanding mathematics department has unshackled itself from what the headteacher describes as 'the tyranny of target setting'. Thresholds of performance assume much less significance; speedy and secure progress based on high levels of

conceptual understanding and the fluent recall of knowledge are paramount. APP grids are used as a 'concept map' rather than an assessment scheme.

This represents quite a culture shift. As Martin puts it: 'This way of dealing with data is beyond what is possible when we were in the business of securing 'good' provision in the department. We *had* to use it as a means of directly controlling and influencing progress then and in doing so recognised the benefits of this tyranny. We responded to the data telling us that something had gone wrong. Now it's used as a way of informing our teaching to ensure that gaps in achievement across different groups don't open up in the first place.'

Time and energy devoted to marking are similarly focused with precision on what matters. Pupils use mathematics workbooks to record thinking and try out ideas in lessons; these are often used as a point of discussion and diagnostic activity between teachers and individual pupils in lessons. They contain almost exclusively pupil-marked work. Homework books are kept and organised more formally and work is marked by teachers regularly, to gauge that the appropriate work has been completed to the required standard as well as to sense individual and group strengths and needs. The termly formal tests are used strongly diagnostically; pupils' responses to questions are analysed in detail and evidence of ideas being embedded, and any misconceptions are identified carefully to inform teaching. Martin sums up the aims for the department: 'We want pupils to find maths fun, challenging and totally relevant to their lives – we want them to be mathematicians, not just pupils that get good test outcomes.'

Lesson observations are frequent yet feel like a natural part of the department's work. Performance management objectives are set against the school's '10 teaching principles' and improvements in teaching are tracked promptly.

Headteacher Derek reflected on what may constitute effective advice to good departments wanting to make 'the quantum leap to outstanding'. He feels that it is important to realise that '... it involves a series of metamorphoses; it isn't a smooth transition and there are no shortcuts. For example, departments need time to move through the data culture that enabled them to become good, and stop being a slave to it in order to become outstanding. They need to replace this with genuinely exciting teaching and learning. It takes confidence on the part of the department's leadership to recognise that targets, structures, performance management and inspections all matter – but they are all means to an end.'

So where does Allenbourn go from here? Derek speaks of the 'terror of becoming stale' but is confident that there are ways of preventing this; and ways of continually reinventing pupils' approaches to using and applying mathematics to keep them excited and challenged. He says, 'It is a very demanding approach for a mathematics department, and you need some talented staff, but the proof is here in the great progress made by all!'

The school's background

Allenbourn Middle School is located in the market town of Wimborne, Dorset. This school for pupils aged nine to 13 is consistently oversubscribed and attracts pupils with a wide range of abilities, though the proportion with special educational needs and disabilities is below the national mean.

Are you thinking of putting these ideas into practice; or already doing something similar that could help other providers; or just interested? We'd welcome your views and ideas. Get in touch [here](#).

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