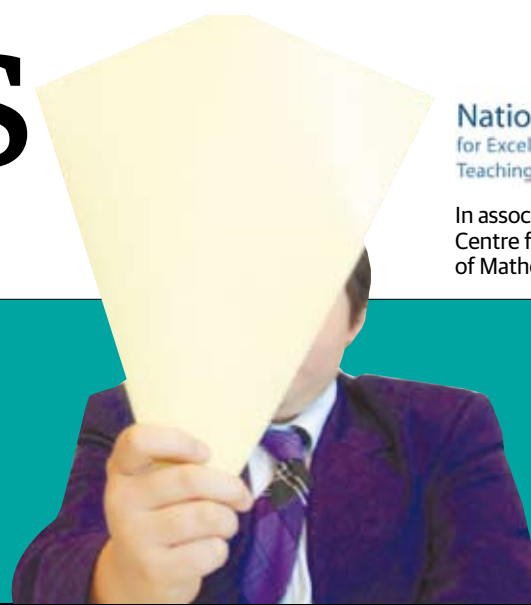


# Magic in maths

27.11.07 Putting the buzz back in the classroom

“**Maths is a language as well as an art and a science and if you can't speak it, you can't do it**”  
Sue Johnston-Wilder, page 7



## Introduction

### A skill for life

Maths is a subject that holds the key to understanding so much about what makes life tick and yet many people find it difficult and impenetrable. A government report in 2004 found that there was a shortage of specialist maths teachers, a failure to meet the needs of learners and the number of maths graduates was dropping. Four years later the situation is rosier and improvements are in large part due to the efforts of the newly created National Centre for Excellence in the Teaching of Mathematics (NCETM). The centre aims to provide consensus by the end of April 2009 on what is effective learning in maths and what this means in the classroom.

In this supplement we look at the work of the centre and show how it recognises the importance of maths to the whole of society and the central role that teachers have to play in engaging their students.

We talk to a wide range of stakeholders including academics, teachers, members of maths associations and directors of national strategies. We look at new maths initiatives such as the Further Maths Network, a government-funded scheme that aims to increase numbers of students studying maths at AS- and A-level.

We show how the centre gives teachers the opportunity to enhance their professional development and access to online materials through their web portal. The NCETM small grants scheme offers teachers the chance to develop new and innovative approaches to learning.

We also focus on what makes good teaching and learning in maths in the classroom and look at the importance of ICT in the teaching of maths. There has never been a better time to be a maths teacher – and as one teacher says: “I think that maths is the most amazing thing ever, and I want other people to think this too.”

Sarah Jewell

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## All change in our calculations

A lack of specialist teachers plus curriculum changes have seen student numbers nose-dive at A-level. But a new initiative is starting to turn the tide, says **Dorothy Lepkowska**

In almost every other country, it would be considered shameful. But Britons who lack competence in mathematics almost make a virtue of the fact they may never have passed an exam in the subject. “I'm useless at maths,” accompanied by a laugh, has become the accepted mantra of a nation which has struggled for decades to get to grips with the subject.

The stark reality of the problems facing the teaching and learning of maths were outlined in a report in 2002 by the Advisory Committee on Mathematics Education, which looked at teacher expertise, and another report, Making Mathematics Count, which was the culmination of a major inquiry into post-14 maths education, in 2004.

This study identified a shortage of specialist maths teachers and a failure by the curriculum, assessment and qualifications framework to meet the needs of learners, and satisfy the requirements of employers and universities. It also found a lack of resources, infrastructure and professional development to support and nurture teachers.

Schools have certainly found it hard to recruit teachers. At Blessed Edward Oldcorne, a Catholic specialist maths and computing college, in Worcester, headteacher Sean Devlin has spent almost £160,000 in the last four years improving facilities and recruiting teachers who are all maths specialists.

Lorraine Chapman, head of maths, says: “When you have an experienced, stable staff you are able to make the subject more exciting and use different learning styles. Maths becomes a joy and not a chore. Staff can bounce ideas off each other.”

Professor Adrian Smith, author of Making Mathematics Count, says school are starting to turn things around. “Back in

2004, it was rather a depressing picture. We found that pupils were being taught badly and a third of maths lessons were not being taught by a specialist.

“Diminishing numbers were continuing with maths after GCSE and there was a fall in numbers doing A-level following the catastrophic introduction of AS levels. The three-tier GCSE meant that 30% of candidates could never get a C and pass, and 25% were not challenged.”

Four years after Professor Smith's report, the numbers wanting to do maths at university are rising and changes are being considered for the secondary curriculum to make it more appealing. Efforts by the Training and Development Agency for Schools to encourage more graduates into maths teaching have led to doubling in annual applications to teacher training institutions to more than 2,000.

### Virtual institution

The improvements are largely attributed to the creation of the National Centre for Excellence in the Teaching of Mathematics (NCETM). The “virtual” institution, supported by a web portal, was set up in 2006 following the recommendations of the Smith inquiry, with a remit to promote the subject nationally and coordinate professional development for teachers.

Professor Celia Hoyles, its director, is delighted with the impact the centre is making. She says: “Until now teachers have had fragmented, or unstructured, continuing professional development (CPD). Our role is to coordinate all the activities that are available from various providers, such as the national strategies and the universities.”

“Maths should be an exciting subject, but we have been hampered by a skills shortage in teaching. There are some wonderful nuggets of innovative teach-

ing going on that all schools should know about. Our job is to disseminate all the good practice in our schools and colleges.”

The centre is currently examining what constitutes effective learning in maths and is scheduled, next spring, to publish a report outlining the views of key players, including the subject associations, Qualifications and Curriculum Authority and the inspections watchdog, Ofsted.

Hoyles says: “Maths is a continuously evolving subject in terms of its applications in science and technology, but there are also aspects which are constant. The way it is taught and understood is changing. For example, we want to see ICT used more in maths.”

She adds that the centre would also target headteachers and principals who needed to take the subject more seriously as a central plank in whole-school or college improvement.

“It is important that they support their maths teachers and allow them time and space to engage in CPD – so maths teachers who have traditionally worked in isolation can be part of the whole organisation culture.”

Dr Malcolm Swan, from Nottingham University, is leading a new project, Mathematics Matters, on behalf of the centre. The study follows on from the findings of the Cockcroft report, Mathematics Counts, 25 years ago, which looked at teaching styles and approaches.

**‘We need specialists because this is not a subject where teachers can blag their way through lessons’**

Between now and February next year, Swan will chair regional meetings examining current practice in classrooms before reporting back. “It is time to have another look at what maths teaching is all about and what values it should embrace,” he says. “The centre is trying to get a feel from the profession about what constitutes excellent teaching, so we are looking at what we want and should be doing, rather than what is driven by government initiatives.”

An NCETM conference last summer looked at the purposes and values of teaching maths, whether lessons were inspirational and what obstacles stood in the way of good teaching. One area of concern was the teaching of mathematical techniques and coaching pupils for exams, rather than how to apply knowledge. Swan describes this as the “drill and kill” technique, because it was putting students off the subject.

“We have to question why we get students up to a certain level if they just end up hating maths,” he says. “There must be more reasoning and problem-solving, because these skills transfer across all areas of learning.”

Chris Oakes-Monger, who has taught maths for 32 years in state and independent schools, agrees that a change of emphasis is needed. Even his current school, Charterhouse in Surrey, a leading independent, had problems with recruiting good maths teachers, he says.

“We need specialists because this is not a subject where teachers can blag their way through lessons. There is nowhere to hide in maths and you will be found out.”

Oakes-Monger says the attitude of pupils towards maths was also a cause for concern. “Many young people decide early on that they are no good at maths or just don't like it. It is very hard to get them out of that mindset, so we do need to review how this subject is taught.”