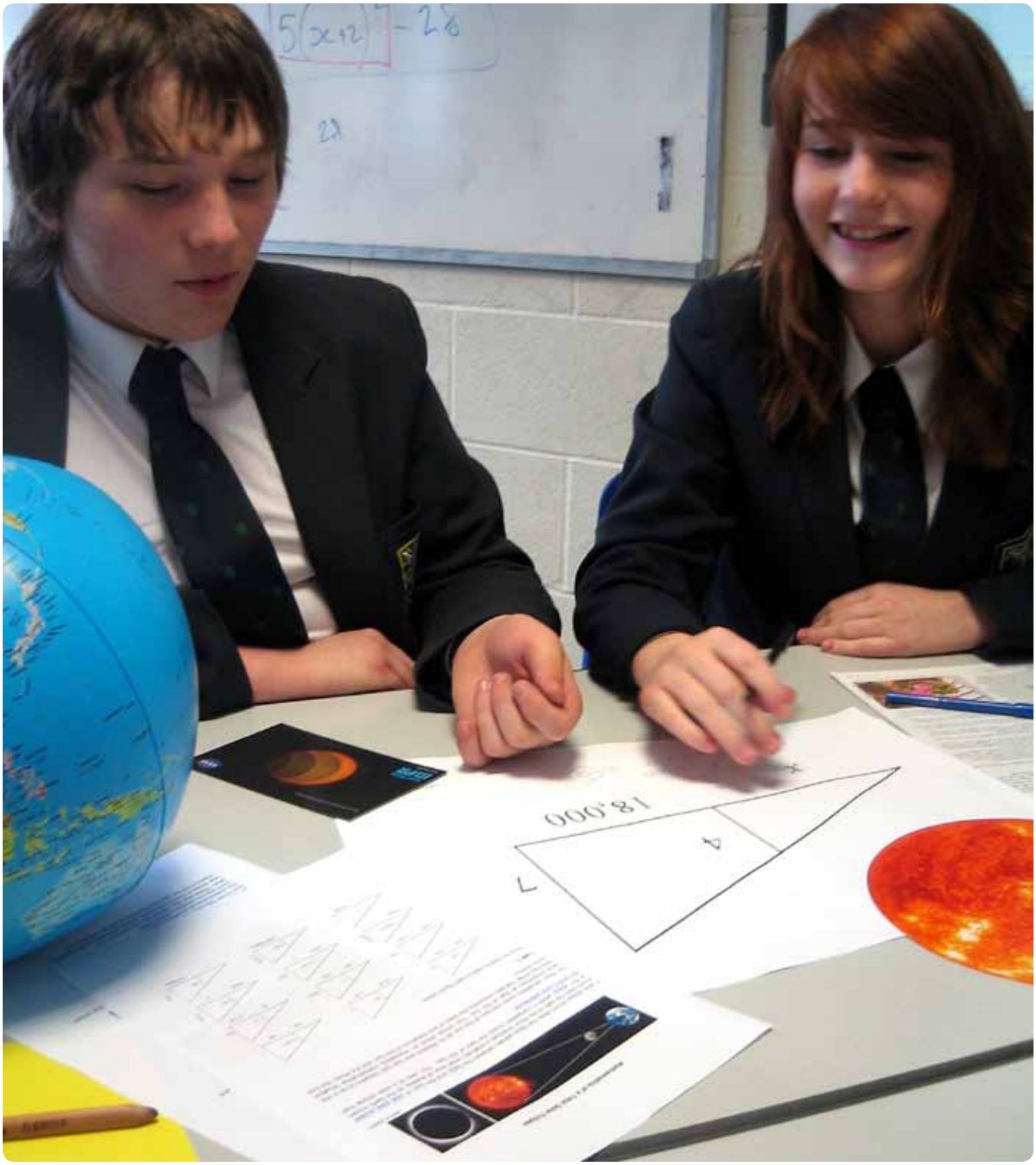
Maths & Computing

Specialist Schools and Academies Trust
THE SCHOOLS NETWORK™

Maths & Computing Update
spring 2010



Please circulate to: headteacher – director of maths & computing college – head of mathematics – head of ICT

Welcome

Welcome to the spring 2010 update for all teachers of maths and computing. In this issue we learn how maths and space can be linked to further enthuse classroom learning and about free Specialist Schools and Academies Trust (SSAT) resources that could help set your pupils off on the right financial track for the future.

There is also the opportunity to hear news of six new lead practitioners who have recently begun work to develop curriculum materials that embed science, technology, engineering and mathematics (STEM) careers awareness in lessons, as well as a reminder that CREST Awards have been relaunched.

It is time to look forward to our next annual conference and, as well as key dates, there are some reflections from a delegate prompted by the last event in Warwickshire.

There is the regular article from the chair of the headteachers' steering group as well as information on where details of the new redesignation system will be posted.

This issue also presents the chance to find out more about the third member of the SSAT mathematics team with a short biography from Andrew Reeve, the new national network coordinator for mathematics.

Viv Sloan
National Specialism Coordinator
viv.sloan@ssatrust.org.uk

Space for exciting maths

Graham Colman teaches mathematics and astronomy at Wymondham College, Norfolk and is an SSAT Mathematics Lead Practitioner. He explains how to make mathematics more exciting by using space.

Pupils love space. It's exciting and it's huge! It provides a great real life context for teaching many areas of the mathematics curriculum.

Space is intrinsically linked to mathematics. Look in any history of mathematics book and you'll find references to the development of mathematics in understanding the heavens. Early Babylonians used a sexagesimal (base 60) number system, on which time is still based, because that was their primary purpose for mathematics. Working in sexagesimal is a great activity to try with pupils. Whether you tell them they're converting sexagesimal to decimal or hours and minutes to minutes is up to you! From this activity it's easy for pupils to consider binary number systems, index laws and standard form.

Space provides an obvious yet engaging introduction to standard form. There are some great animations amongst the vast array of space websites and these can inspire pupils by helping them visualise the true scale of things from 10^{20} down to 10^{-20}.

Mentioning large numbers, imagine pupils' excitement when they complete a statistics task on estimating the number of galaxies in the universe. Using an image called the 'Hubble Deep Field' pupils can achieve the same task as astronomers in finding this answer. It is real life; they'll achieve success in many areas of mathematics because, suddenly, their mathematics has a context. They'll even want to check their answer with the real figure, find their percentage error and tell parents what they did in maths that day.

If this all sounds a bit daunting, don't worry. Pupils will ask all manner of questions but it's OK not to know the answer. A pupil once told me

that her key learning outcome was simply that 'not all questions can be answered'.

Space is brilliant for teaching A-level mechanics. What's more exciting about f=ma than a space shuttle launch? With websites such as YouTube and HD videos from the NASA website, it's easy to bring this engaging, exciting, real life example into the classroom.

Topics such as similar triangles, ratio and fractions can all be extended in an exciting way by considering the mathematics of a solar eclipse. A nice, practical mathematics activity for the summertime is to make 'pinhole cameras' and take pupils outside to measure the image of the Sun and thus calculate the width of, or distance to, the Sun itself.

The best thing about all of these examples is that they provide exciting, real life purposes for doing mathematics. Pupils are no longer doing maths just because they have to, but because it becomes a useful tool for discovery.

Maths and science careers continue to need new recruits and, as teachers, we are at least partially responsible for this. It's our job to inspire pupils and to engage, excite and extend their mathematical abilities, and space is a great vehicle for achieving this. I'm not recommending you use it every day but, being such a rich source of resources, where appropriate give it a go. I've been collecting all of my favourite space activities on my website. They're all free to use so take a look and inspire some pupils today. All activities mentioned above can be found using the link www.colmanweb.com (choose 'Maths' then 'Space/Maths').

Graham Colman
SSAT Lead Practitioner for Maths & Computing and Ambassador for the National Centre for Excellence in the Teaching of Mathematics (NCETM)

The important role of maths & computing specialist schools

On behalf of the headteachers' steering group, I express our gratitude for all that is happening in maths & computing specialist schools to raise levels of numeracy and ICT competence. We recognise the part played by these schools in contributing to the continued improvement in the national headline figure of five good GCSE grades including English and mathematics. I am sure we all appreciate the challenge it is to maintain the motivation of those learners who find mathematics more difficult to engage with, and so many look to our specialism for support and inspiration to address this issue. We therefore thank the numerous colleagues in our schools who share their ideas and work to enable us all to benefit. Conferences are one such example where it is easy to see the SSAT mantra of 'by schools, for schools' working so successfully.

We are also aware, however, of how much support there is happening inter-professionally between schools, particularly in 14-19 consortia. A good number of maths & computing specialist schools are involved in the delivery of the new diplomas and the functional skills aspect of the qualification. Our thanks, therefore, for these innovative endeavours. Even though it feels as though there are several uncertainties within the education landscape for the forthcoming year, one thing remains a certainty and that is the difference teachers and schools can make in young people's lives.

We wish you well for all you continue to do to support, challenge and inspire our learners to exceed their own expectations.

Ian Potter
Chair of the headteachers' steering group

Leading practice in space education

Science, technology, engineering and mathematics (STEM) are universally seen as essential for economic success and schools are being encouraged to increase engagement and participation in these subjects as part of the STEM agenda. Space is frequently used as a vehicle to attract students into STEM areas. It can provide a contemporary and exciting context for learning STEM subjects and wider learning including environmental and global themes. The space industry has one of the highest skill and productivity levels of any UK industry, employing nearly 20,000 individuals with a turnover of over £6 billion, and includes earth observation, satellite design and remote space exploration technologies – so learning in this context is not without relevance.

Free resource shows learners their financial future

Adding up to a lifetime 2009 launch

Surviving as a student, changing career, getting married, saving for the future – these choices are some of the most important financial decisions your learners will ever make. The SSAT has a free financial capability resource designed to give students an insight into how these decisions can affect their lives.

Adding up to a lifetime is an online resource which follows the lives of four different animated characters through five stages of life including 'life as a student', 'working life', 'relationships', 'new life' and 'active retirement'.

Di Lloyd, Support Development Partner, who wrote the content for Adding up to a lifetime, said the resource uses storylines to engage students about financial decision making. She explains:

'Adding up to a lifetime is an inspiring and engaging resource delivering personal finance education to key stage 3 and 4 students. It clearly shows learners the impact that different financial decisions can have on their lives. For example, two of the characters, Matt and Prima, get married and end up having a baby. Students are encouraged to consider all the different financial implications of these events.

'The two other characters go down very different routes – Holly is careless and fritters her money away, while Daniel is very conservative and saves for the future. Students are shown the outcomes of these approaches. Holly ends up forging out a meagre existence on her state pension, while Daniel gets to retire in Spain and play golf for the rest of his life.'

The resource includes 25 hours of learning activities and uses a mix of animated characters, real life interviews, text and interactive games and puzzles. Schools are encouraged to involve real people from their own communities to join discussions with students so that the activities can be brought to life.

Adding up to a lifetime was borne out of the realisation that young people need a clear understanding of the skills required in making crucial life decisions. It aims to equip young people with the knowledge and skills required for them to make informed choices when they face personal and financial decisions at various stages of their lives. As students work through the resource, they will discover some of the implications that financial decisions made earlier in life can have on them at later stages, including retirement.

Relevant topics include:
- banking and bank accounts
- benefits and allowances
- borrowing and credit
- budgeting
- earnings
- insurance
- investment
- mortgages
- pensions
- shares
- tax.

To access Adding up to a lifetime online please visit www.addinguptoalifetime.org.uk

STEM subject choice and careers lead practitioners

The following six teachers have recently undertaken to become the SSAT lead practitioners, in conjunction with Sheffield Hallam University and VT Enterprise, to design and develop materials for teachers, departments and schools as part of the Government's science, technology, engineering and maths (STEM) agenda.

Initially, they will work in their own schools and then disseminate to local partners. The end of the programme in July 2010 will see the production of case studies and materials for wider dissemination.

The practitioners listed below represent both maths & computing and science specialist colleges:

Lead practitioner	Region	College
Michele Dooley	South East	The Grammar School for Girls, Wilmington, Maths & Computing College
Sara Khan	East	Francis Bacon Maths & Computing College
Elizabeth Cullen	North West	Helsby High School, Science College
Kelly Simmons	South Central	Bay House School, Maths & Computing College
Ed Dickinson	East Midlands	The Long Eaton School, Science College
Andi Manns	North East	Thomas Hepburn Community College, Science College

Andy Reeve's introductory portrait

In the autumn 2009 edition of the maths & computing update, Viv Sloan introduced me as the new member of the team and promised that I would circulate a self-portrait.

My name is Andy Reeve and I have recently been appointed to the SSAT as national network coordinator: mathematics. I am the main point of contact for specialist schools that are not maths & computing colleges but have mathematics as a target setting subject.

I regard myself as a product of science, technology, engineering and mathematics (STEM). An interest in science and technology at school led me to an apprenticeship as a welder/fabricator in Suffolk before moving to Plymouth in 1985 to study for a degree in mechanical engineering followed by a PGCE to teach mathematics.

I have taught mathematics in a number of Devon schools. Prior to joining the SSAT I was director of specialism and assistant vice principal at Stoke Damerel Community College, a high performing specialist maths & computing college. My responsibilities for this post included leading a successful bid for specialist college status and management of resulting initiatives. I have also worked on secondment for Plymouth Education Authority as a consultant in school self-evaluation, improvement planning and e-learning.

I enjoy family life and keep active by running, cycling, diving and spending time in the gym. I have a passion for music and I play the guitar.

Andy Reeve
National Network Coordinator: Mathematics
andy.reeve@ssatrust.org.uk

Fostering mathematical adaptability in the new generation

Jackie Fairchild, Assistant Headteacher at Gosford Hill School, describes what she gained from attending the summer 2009 maths & computing specialism conference.

The summer 2009 maths & computing specialism conference was inspiring. There was a huge range of talks and opportunities for discussion including new technology, deep understanding at A-level and driving up GCSE mathematics results.

A strong theme of the conference was how we draw together new technologies, experiences and opportunities to shift students from a reliance on procedural fluency in mathematics to have the security to engage with conceptual understanding and experimentation.

Opinion sometimes appears divided between the priority of students gaining functional skills versus a deep understanding of mathematical structure. We can and must facilitate both for our students in order for them to recognise mathematics in a wide variety of situations, some of which will be in the workplaces of the future and unknown to us now. Furthermore, the mathematical toolkit and the understanding of the subject as an interconnected web of ideas facilitate innovation and creativity, as well as an appreciation of culture throughout history.

The variety of the curriculum and opportunities it brings, such as field trips and visits, provide a wealth of opportunities for students to select for

themselves appropriate mathematical skills and to model situations mathematically. The shifting of attention onto the mathematical structures and relationships involved in practical situations, such as dance and cookery, heightens students' awareness until they begin to identify these for themselves and engage with them in order to help with problem solving.

A deep understanding of mathematics is needed at any level in order to transfer skills to as yet unknown situations. Mathematics lessons provide the ideal forum for developing students' mathematical understanding and the curriculum provides a wealth of opportunities for students to apply mathematical reasoning, with the support of teachers across the curriculum.

Jackie Fairchild
Assistant Headteacher
Gosford Hill School
Kidlington, Oxfordshire

CREST Awards relaunched – creativity in the classroom

CREST is the British Science Association's national award scheme for project work in science, technology, engineering and maths (STEM). It gives young people aged 11-19 creative opportunities to explore real world projects in a way that ties closely to the curriculum.

CREST Awards are extremely flexible – they can link into work experience placements, after school clubs or several linked schemes.

CREST Star Investigators, meanwhile, offers a host of pick-up-and-run hands-on activities for primary aged students: the perfect way to engage with your feeder schools.

If you'd like to know more about CREST Awards, then visit our website at www.britishscienceassociation.org/crest

Changes to the specialist schools programme

The recent government White Paper has outlined major changes to the specialist schools programme. These changes are due to come into effect in early 2010. Information on these changes and any interim guidance can be downloaded from the following link on the Department for Children, Schools and Families (DCSF) website:
www.standards.dcsf.gov.uk/specialistschools/

Annual maths & computing conference 2010

Generating the X Factor: Creativity and enjoyment in the new decade

This year's conference will be held at the Radisson Blu Hotel, Manchester Airport on 23-24 June 2010. This year we are hoping to offer two offsite trips as part of the programme, one to a nearby high performing school and the other to Jodrell Bank.

To book please visit:
www.ssatrust.org.uk/specialism/mathsandcomputing/pages/default.aspx

Do you want to teach food technology?

In order to increase capacity for teaching food technology, the Department for Children, Schools and Families (DCSF) is funding a professional development programme for teachers who are not food specialists but find themselves teaching the subject. In the lead up to 2011, there is an opportunity to undertake training on the delivery of practical food lessons, with guidance on nutrition, food science, and curriculum management within a safe learning environment. In addition, a dedicated website is available to provide extra support with structured tutorials for trainees. Further information can be found at www.teachfoodtechnology.org.uk

Maths & computing as an additional specialism

This one day course is designed for subject leaders and middle leaders of high performing specialist schools who are taking on maths & computing as a second specialism.

The day will focus on strategies both for building on a second curriculum specialism and linking it to the school's first specialism. There will be input from schools who have had maths & computing as a second specialism for some time and the opportunity to network with other colleagues embarking on the same journey.

Two dates and venues:
Date: 30 June 2010
Venue: Haslingden High School, Haslingden, Lancashire
Date: 7 July 2010
Venue: Ranelagh C of E School, Bracknell, Surrey

Headteachers new to specialism

Date: 23 March 2010,
Venue: Millbank Tower, London
A one day course for headteachers who are new to leading a specialist school, this course offers insight from experienced headteachers with backgrounds in the science, technology, engineering and maths (STEM) specialisms and SSAT support from national specialism coordinators.

The day covers:
- specialist schools and the purpose of specialism in local, regional, national and international contexts
- managing the specialism and building the ethos
- the headteacher's role in leading a specialism
- the community plan
- the specialism's impact on whole-school improvement.

In addition:
By attending the course you gain access to ongoing support from an experienced mentor headteacher of a school with your specialism.

Dates for your diary

Using ICT to create interactive teaching and learning tools
Date: 13 January 2010
Venue: Shire Oak School
Event ID: SVN1009765

OCR Nationals Level 3 for beginners
Date: 15 January 2010
Venue: Hartsdown Technology College
Event ID: SVN1009762

Everybody can be numerate
Date: 15 January 2010
Venue: Grace Academy
Event ID: PPN1009884

Making mathematicians: engaging our most able pupils
Date: 21 January 2010
Venue: Madeley High School
Event ID: SVN1010137

VLE for ICT
Date: 21 January 2010
Venue: Our Lady's Catholic High School
Event ID: SVN1010093

NW maths & computing colleges network meeting
Date: 10 February 2010
Venue: Philips High School
Event ID: LAN1009130

EM maths & computing colleges network meeting
Date: 4 March 2010
Venue: TBC
Event ID: LAN1009432

NE maths & computing colleges network meeting
Date: 11 March 2010
Venue: St Wilfrid's RC College
Event ID: LAN1009586

SW1 raising achievement in maths meeting
Date: 11 March 2010
Venue: Uffculme School
Event ID: LAN1009022

SW2 raising achievement in maths meeting
Date: 12 March 2010
Venue: St Peter's RC High School and Sixth Form Centre
Event ID: LAN1009000

ER maths & computing colleges network meeting
Date: 16 March 2010
Venue: Cottenham Village College
Event ID: LAN1009485