



Kent & Medway
STEM

 Canterbury
Christ Church
University

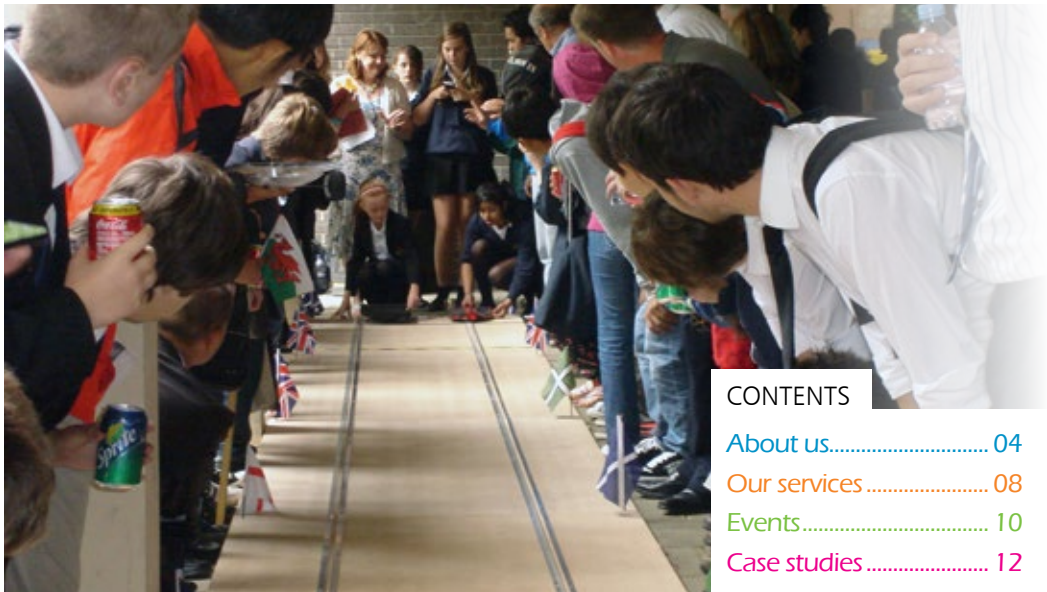
 **STEM
AMBASSADORS**
ILLUMINATING
FUTURES

STEMNET
Contractor 2011-2015




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Helping you inspire your students in **SCIENCE, TECHNOLOGY, ENGINEERING AND MATHS (STEM)**



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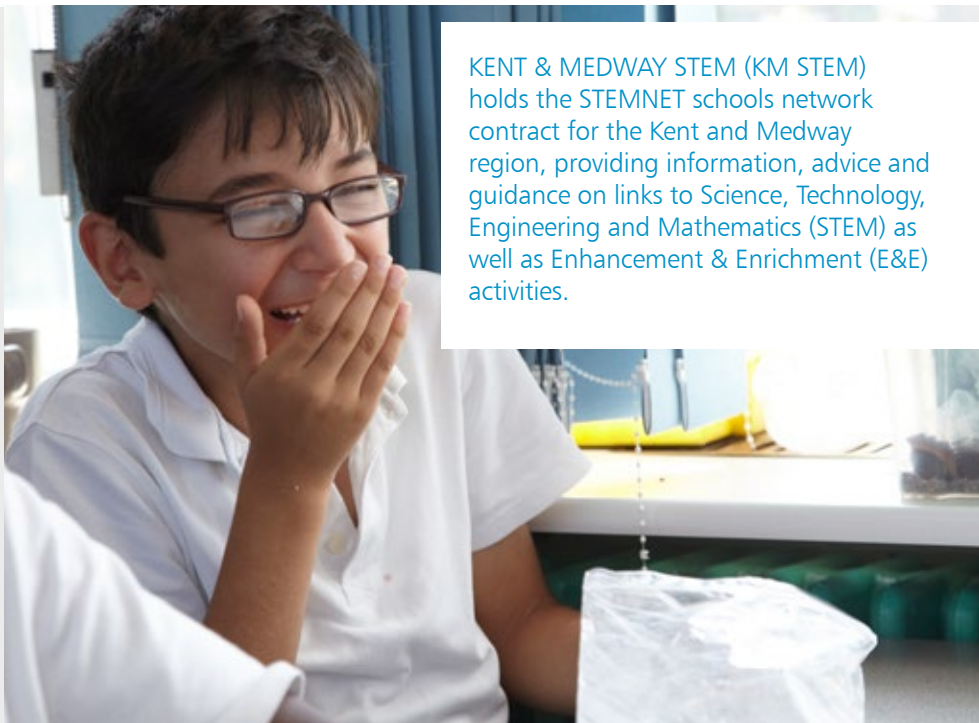
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KENT & MEDWAY STEM (KM STEM) holds the STEMNET schools network contract for the Kent and Medway region, providing information, advice and guidance on links to Science, Technology, Engineering and Mathematics (STEM) as well as Enhancement & Enrichment (E&E) activities.



KM STEM staff are an integral part of Canterbury Christ Church University. We support the STEM agenda by ensuring a good supply of scientists, technologists, engineers and mathematicians are available to support teachers and pupils.

KM STEM has a responsibility for:

- enabling young people to make informed decisions about future career paths in STEM;
- providing teachers with impartial information and support to enable them to deliver STEM curriculum;
- supporting industry in reducing the STEM skills gap;
- raising the profile of science, technology, engineering and mathematics in the region.

We can provide all schools and colleges in the Kent and Medway area with free impartial advice and guidance on a wide range of STEM E&E activities, helping them to identify which opportunities can best inspire their young people in the vitally important STEM areas of learning.

The use of STEM activities helps to produce successful learners by offering engaging and achievable challenges set within relevant contexts. Engaging with STEM helps build students' knowledge, understanding, and confidence.

We also hold the STEM Ambassadors contract for the region, recruiting those who are willing to give their time and energy, free of charge, to help inspire young people in STEM.

The Schools Network and Ambassadors contracts are awarded by STEMNET and run until March 2015.

STEM Ambassadors

STEM Ambassadors support teachers in delivering the STEM curricula. The Ambassador programme offers input from enthusiastic volunteers from industry, education, and research who have a STEM background and experience.

Ambassadors can work with schools and students in a variety of ways. In Kent and Medway schools, our ambassadors have:

- given talks on their career pathway and job roles;
- provided 1:1 mentoring to students;
- provided advice on CV writing, interview techniques or work skills;
- supported after school STEM clubs;
- given practical workshops to pupils;
- taken part in science events such as the Science festival and Jamboree;
- provided support at careers events and fairs;
- supported national challenges both as judges and mentors;
- run subject-related learning experiences.

KM STEM facilitates each ambassador's Disclosure and Barring Service (DBS) check, provides training experiences that help enhance their skills, and matches their abilities and experiences directly to the requirements of schools and colleges.

The STEM Ambassadors programme is coordinated across the UK by STEMNET, and KM STEM has more than 680 ambassadors who actively support local schools.



Our Website

Our website provides a wealth of guidance, information and advice and is regularly updated with:

- STEM news
- Upcoming STEM events
- Reports from successful STEM activities
- Primary and Secondary competitions, grants and schemes
- STEM Ambassador Case Studies

Look at the Events & Reports section, to get ideas and see how other schools have been engaging in STEM E&E activities. Let us know if you have a STEM success story you would like to share on the website.

Check the Calendar for upcoming STEM events, both local and national. There are also links to book free tickets to CPD training events, STEM Teacher Ambassador Network Events, STEM National Conferences and much more.

Free Resources



STIXX MACHINE

A great engineering or physics activity that involves team building.

These machines roll newspapers into solid sticks which can be used to make chairs, towers, bridges, cars, shelters and much more.

We have 3 STIXX machines which can be borrowed free of charge. The machines are very popular so book early to avoid disappointment.

MAKING K'NEXIONS

Set students challenges to follow a brief with a budget or use with your local feeder primary schools. We have 16 boxes of K'nex available to borrow.

www.kentandmedwaystem.org.uk

CAREERS ADVICE & GUIDANCE

The world of work is constantly changing. Ambassadors can provide a recent and relevant approach to this world of work in a variety of formats.

This could take the form of 'a day in the life' talk, a 'What's Your Line?' activity, speed networking event or getting professionals to work alongside pupils in a STEM activity. STEM Ambassadors are available to visit schools to attend careers fairs, mock interviews, CV workshops and to talk about their career pathways.

'The students really enjoyed the event and were engaged in building their STIXX bridges. They gained knowledge about STEM careers and were able to apply their knowledge of forces to a fun and engaging activity.'

- Science Teacher, Herne Bay High School

INCREDIBLE MACHINE



A hands-on tool for teaching forces using pulleys, momentum, mass, acceleration, friction and levers.

SCHOOL NEWSLETTER

Don't miss the latest news each term celebrating STEM activities, with information about events, competitions, grants, opportunities for funding, and other items of interest to STEM teachers.

STEM AMBASSADORS

Our Ambassadors are volunteers working or studying in a STEM field and they support a range of activities, in schools, free of charge.

Contact us today for more information about these resources.

kentandmedwaystem@canterbury.ac.uk

As well as organising STEM Ambassador activities for individual schools, we also arrange FREE central networking events for pupils and teachers.



CHEMISTRY AT WORK

These events are run with the support of The Royal Society of Chemistry and the Wolfson Foundation.

School students are invited to Canterbury Christ Church University to access presentations from local companies and STEM Ambassadors who highlight the importance of Chemistry in their work place.

'I learnt about how lactic acid is formed. I would like to come again for a longer time so that I could go to more presentations and learn more.'

- Sudent, The Archbishop's School

CONTACT US FOR MORE DETAILS ABOUT ANY OF THE FOLLOWING:



TEACHER AMBASSADOR NETWORKING EVENTS

Twilight events held at least three times a year at various locations across Kent and Medway.

'There were great networking opportunities and a chance to update experience and knowledge of STEM areas. It helped us to consider doing a STEM Club - one is due to start as a direct result of this STEM Teacher Ambassador Network Event.'

- Teacher, Thomas Aveling School



CPD TRAINING

Free training events for teachers and ambassadors.

CONFERENCES

Past events include STEM Conferences at Canterbury Christ Church University, Heads of Science Conference and 'Growing The Next Generation of Plant Scientists'.

STEM ADVISORY FORUM

This is a steering group of leaders in education, business and the professions who meet to discuss the way in which KM STEM is running the contract for the benefit of the local schools and to ensure the needs of all learners within the region are addressed.

If you would like to find out more about the advisory forum, please contact the KM STEM team.

CHEMNET SPORTS SCIENCE EVENTS

As a result of positive feedback, KM STEM have organised a small number of chemistry-focused short science visits where students learn about the role of chemistry in supporting elite athletes. A new session on drugs in sports is being developed with the Canterbury Christ Church Department of Sport Science, Tourism and Leisure.

SPECIAL LECTURES

Focussing on different STEM areas, these lectures are organised so that sixth form students can gain an understanding of a STEM subject from an expert. Information is provided in advance via our newsletters and the website.

FREE IN-SCHOOL CONSULTATIONS

The KM STEM team is available to visit you in school for a free consultation to discuss your plans for future STEM activities. Work with the team to provide a customised plan for STEM in your school. KM STEM offer impartial advice on how to take your schools' plans and aspirations and turn them into reality. An Annual Review of STEM in your school is found to be beneficial for schools ensuring they are taking up all the free opportunities available.

Rebecca Shewry

Specialist Weather Forecaster
THE MET OFFICE

How did you first become interested in STEM as a career?

I grew up in rural Suffolk and had an interest in nature, and how things work from a very young age. This progressed further whilst I was at school with Geography and Science being my favourite subjects. I always had a keen interest in weather and climate, and it just seemed like a natural progression to make it in to a career.

How did you get to where you are now?

I took A Levels in Geography, Biology, Chemistry and ICT at school before undertaking a BSc (Hons) in Physical Geography at the University of Reading. I always enjoyed studying weather/meteorology throughout my schooling and degree, and so decided to try and make it into a career. From Reading I went on to complete an MSc in Meteorology and Climatology at the University of Birmingham. This led me to a career as a Weather



Forecaster at the Met Office. I first started at the Met Office headquarters in Exeter where I undertook an 18-week training programme and on-the-job training.

After qualifying I took up my role as a forecaster providing forecasts to the aviation industry, winter road maintenance and various commercial companies. I currently work in our London Office providing multi-media services for television, the internet, and mobile devices.

What inspires and enthuses you about your work and STEM?

In my job every day is different and this keeps things interesting and me on my toes.

I know my team and I play a vital role in enabling the public to make informed decisions about their day-to-day activities, and this inspires me to work harder and continue to improve and learn. My role as a STEM Ambassador is very important to me as I want to encourage young people to be enthusiastic and excited about Science - much like I was at their age. I feel it is also important to promote the Met Office as a STEM career choice to encourage the next generation of weather forecasters and climate scientists.

How much time do you commit to ambassador activities?

I try to undertake as many ambassador activities as possible throughout the year. In the last 18 months I have completed 8 activities ranging from option evenings to talks on extreme weather.

What activities have you been involved in?

The majority of the events I have been involved in are career related. This includes manning Met Office stands or talking to students and their parents about career prospects and availability. I have also been in to schools to aid the teachers in their teaching of the curriculum.

This has ranged from talking about forecasting the

weather to Year 3 students, rainforests with Year 4 students and case studies of extreme weather with A-Level students.

What are the positive outcomes for pupils when STEM Ambassadors visit schools?

When STEM Ambassadors visit schools the students get to meet people from the wider world and gain an understanding of how STEM subjects relate to their lives and the employment opportunities available to them.

What are the positive outcomes for you?

I thoroughly enjoy being a STEM Ambassador and feel it is my way of encouraging and inspiring students – much like my teachers, parents and peers did for me when I was at school. It allows me to share my passion and enthusiasm for Science with the hope that it will rub off on the students. It is very rewarding, especially when you get that ‘light bulb moment’ when what you are speaking about suddenly all makes sense to them.

Any advice for new STEM Ambassadors?

Be friendly, welcoming and always go prepared. The students will have many questions for you, but often they need a little encouragement from you to ask.

Simon Smith

Fire Investigation and Research
Team Co-ordinator
KENT FIRE AND RESCUE SERVICE

Why did you become a STEM Ambassador?

During my time in the fire service I have come to love science and the practical application of the science learnt during my vocational experiential career.

I feel it is vitally important students are not put off learning about science and how it interacts with everyone on a daily basis. It is all too easy for students to think science is only performed by scientists in white coats and is only for academically minded people. I want to explain the ways in which science is vitally important to the role of a fire-fighter and fire investigator. I can remember many inspirational teachers and mentors that have influenced my understanding of the subject and if I can inspire just one person to come to love the subject as much as I do, then I feel my time has been well spent.



What activities have you been involved in?

I have presented fire science to all age ranges from early years to undergraduate at a range of schools, universities, and colleges in the Kent and Medway area. Along with other STEM Ambassadors from various science, engineering, and emergency service backgrounds I have been involved in major events at schools and colleges including Chemistry at Work run by Kent & Medway STEM with the support of The Royal Society of Chemistry.

Many students do not understand the science behind engineering, plumbing, electrics and electronic engineering etc.

Students attending these events get a clearer view of the wide range of potential science based careers as well as the application of science in careers some students might not have realised beforehand.

Many young people believe the emergency services and armed forces are careers of fitness and action, paying little thought to the underlying scientific principles that have to be understood to safely fulfil the roles. My presentations at events show the science of the development of fire and how fire-fighters fight fire whilst protecting themselves.

I demonstrate how an understanding of the scientific principles allows them to do this as well as how a fire investigator applies scientific principles to reading the signs of fire to identify the origin and cause of the fire.

Do you have any tips for future STEM Ambassadors?

Be yourself. If you are not an academic but you have an understanding of science and use scientific principles in your profession or trade, then this should come across to the students naturally which is what STEM Ambassadors are supposed to be doing- showing students that STEM careers and education are achievable goals.

You will need to be confident that you will be able to reach the pupils if running a workshop or giving a talk, so practical demonstrations, movies and case studies are often much better than large numbers of PowerPoint slides.

I do use a computer and projector to aid my presentations but remember that the students do not want to be given a boring list of facts.

Do you have any tips for teachers who haven't yet engaged with KM STEM Ambassadors?

To those teachers who have yet to work with STEM ambassadors I would encourage you to invite STEM Ambassadors into your school and allow your students to engage with people doing science or engineering outside of a classroom as it will help to motivate your students to learn.

Many students have a feeling of inferiority or lack of relevance with regards to science, possibly leading to poor motivation to learning. Many students appear to feel science is the pinnacle of academic learning, disassociated from the 'real world' of work and therefore not for them.

A STEM Ambassador Support Activity

St Anselm's Catholic School
Physics Club

St Anselm's Catholic School in Canterbury enjoyed the help of STEM Ambassador Peter Kean at their weekly Physics Club. The club met once a week for students who were interested in enhancing their Physics knowledge. The students experimented with different lenses, making a pinhole camera then a simple camera with an array of lenses and even a working telescope.

From STEM Ambassador Peter Kean:

Following a request from one of the teachers at St Anselm's, we have been running the STEM club at St Anselm's approximately once a week since last Autumn. The club kicked off with a presentation where I gave a general talk about Physics with some home-made demonstrations! (Static electricity, guiding light, Bernoulli's principle etc.). The core club members have been 4-5 enthusiastic students from years 10&11.



The brief from the teacher was to include some theory and experiments on lenses in the club since this is what the students would be moving on to in class. We began by making a simple pin-hole camera and then introduced a lens, demonstrating the benefits this brings to capturing an image.

Most recently, the club have constructed a free-space optical link (audio link) based on a modulated LED and photo-receiver. Initially the range was limited to a few centimetres but by the addition of lenses, they have already increased the range to several meters!

The aim now is to take the system out-doors and see how far they can communicate.

It has been very rewarding to work with the teacher, seeing the students gain an understanding of optics and light. Several simple experiments performed were described by the students as 'very cool'!! In today's world of advanced technology, it is very rewarding to understand the basic principles of how things work through some relatively simple experiments.

Peter has been involved in many STEM Ambassador activities including the Solar Car Challenge and Building a Crystal Radio, an LED lesson at Callis Grange Infant School. He has a PhD in laser physics and his areas of expertise include lasers, optics, fibre-optics and electro-optics.

Pfizer Ltd.

Education Engagement

Pfizer, one of the world's largest research based pharmaceutical companies, have in the last year further enhanced their educational engagement with schools in the region. Pfizer are committed to supporting the next generation of STEM students by providing schools with support to increase an interest in Science; this has been achieved by using a range of enrichment and enhancement activities.

One new activity introduced to schools focuses on the creation of cheese and butter. Whilst mixing ingredients pupils use mathematics as well simple scientific experimental design.

The aim is to bring them away from the traditional 'chalk & talk' method and show that there are other ways to learn about science. This has proven to change the way pupils see and understand these subjects and feedback from pupils show that it is a more enjoyable way to learn.

Pfizer have worked with a variety of schools with pupils from primary age range to sixth form students undertaking everything from designing badges, testing aspirin, undertaking simple electronics, supporting dissections, carrying out experimenting with disintegration rates, as well giving careers advice.

The A-level site visits provide an opportunity to demonstrated how to use some of the state-of-the-art equipment, including an NMR (Nuclear Magnetic Resonance) spectrometer. Commenting on this part of the experience, one of the students said: "Working through uncovering the unknown compound structure from mass spectrometry was great but using the NMR and IR spectrometers was the best part".



'Please keep these events going! I'd love to have some of the presenters visit my school.'

- Teacher, Sandwich Technology School



'Demonstrating Forensic Science in an exciting and fun workshop the students made me feel like I had really made a difference, especially after being told by a student they now wanted to become a Forensic Scientist.'

- Gemma Beresford, STEM Ambassador



'The best part of being a STEM Ambassador is watching for that moment when the light bulb goes on in a student's head and they suddenly understand what you are explaining to them.'

- Rebecca Shewery, STEM Ambassador



'KM STEM provide you with the know how, information and support needed to make a real difference to the next generation of young hopefuls.'

- Jonathan Reed, BLOODHOUND SSC STEM Ambassador





'Our STEM ambassador has shown great interest in our pupils raising their aspirations and improving self esteem.'

- Debbie Downey,
Teacher, Pent Valley Technology College



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