



ENGINEERING FOCUS

OCTOBER 2012



ROCKETING TO SUCCESS!

Bloodhound SSC has just carried out extremely successful trials on the HTP and rocket system that will be fitted in the Bloodhound SSC car and this is a major step forward in this thrilling journey to the 1000mph barrier.

Dave Rowley, Education Programme Director—South Africa said “Everyone in the team had their fingers crossed for a successful firing as it was a live experiment being watched by thousands worldwide and the outcome of the firing is such a big part of the engineering jigsaw picture! Without Daniel Jubb’s rocket, 1000mph would not be possible. So it’s all systems go with further Cosworth F1 pump fed rocket tests planned.”

This was the largest rocket ever to be designed in Europe and the biggest to be test fired in the UK for 20 years. It burned for 10 seconds generating 14 000lbs of thrust.

This fantastic event was streamed live across the world sharing the excitement and tension with the team as the Cosworth F1 engine revved up and the rocket ignited with spectacular success.

The mission statement for the Bloodhound SSC team is -



Daniel Jubb - Self taught Rocket Scientist

- ◆ To confront and overcome the impossible using science, technology, engineering and mathematics
- ◆ To motivate the next generation to deal with global 21st century challenges

Part of this statement includes the sharing of the Science and Engineering of their project freely through their education teams and their website. Cisco one of the many sponsors for Bloodhound SSC has done a wonderful job of producing a range of programmes explaining a wide range of aspects of the project from the effects of drag through to the use of additive manufacture to reduce the impact of the project on the environment. These videos are on the bloodhound SSC website at <http://www.bloodhoundssc.com/bloodhound-tv> I can thoroughly recommend them.

As an education centre for the Bloodhound SSC project this has fired our enthusiasm for developing further projects to run both in school and at our partner primary schools giving students the chance to find out just how exciting engineering can be.

New developments about our work with Bloodhound in the next issue



Mach Diamonds in the Rocket Plume

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NEXT TIME:

- ◆ **Arkwright Scholarships**
- ◆ **Microsteam cars**

SCIENTIFICALLY SPEAKING



Testing fuel grades

Lubricants on a microscopic level



“Imagination is more important than knowledge” - Albert Einstein

Students learn about the molecular structure of materials



Year 8 Students had an excellent opportunity to learn more about the science they study and how they can use their knowledge and skills in future careers.

Students spent a day taking part in a wide range of activities provided by guest speakers from Intertek. Intertek is an international company that is responsible for testing and inspecting the quality of a wide range of products to help companies make their products safe and good quality for consumers. Scientists from Intertek came in to demonstrate the work that they do inspecting aviation fuel to ensure its quality to make sure that aircraft all over the country fly safely without engine problems.

They showed how they test the fuel in tankers to make sure the client is getting the grade of fuel or oil they are paying for and explained that you can transport oils with different specific gravities in one tank as they separate into layers; they can then collect samples from each layer to make

sure that the oil is as expected.

Risk Assessment of products was another key feature looking at how the design of a product contributes to its safety and showing how seemingly harmless products can be tested to make sure they are as safe as they look.

Intertek works for some of the world's leading toy companies to make sure products are safe and to reduce the risk of injuries.



Students also learnt about lubricants, testing cargo for hidden contraband and had the opportunity to test petrol taken from a range of different fuel station forecourts, as well as the wide range of career opportunities there are in the field of science.

The purpose of the day was to give students a greater insight into how the skills and knowledge they are learning in science can lead onto varied and fascinating careers and this was definitely a success.

Tracey Ottley, HR Manager for Intertek UK said “Science is so important in the work that Intertek does and is central to the expertise that our people bring our customers. We



are enjoying being able to come into the classroom and show students examples of science-in-action in a ‘real-life’ way, and the career opportunities that science can offer”.

Students from the school said that they liked learning about the wide variety of careers and the experience was different, informative and fun. One student said “I liked the example of the plane crash; it intrigued me and was well explained”

Mrs Smith, Engineering Specialism Co-ordinator said “This was a great event that encouraged students to think about their future and the types of careers available to them.”



Intertek



On Tuesday the 25th a group of year 8 & 9 students went to TeenTech at Tunbridge Wells. Schools from around Kent came to learn about the wide variety of jobs that Scientists and Engineers do, from designing games to designing and building models.

In the morning we were split into 2 groups of 5, and the first thing we did was go to a station with 2 engineers talking to us about a software that could edit videos and films. This was very interesting and

TEENTECH!

we got to edit are own groaning in the background because the video was set in a World War 2 hospital.

The next station we went to was the spaghetti challenge where we had to build a tower out of spaghetti and 5 marshmallows that was taller than 25cm tall and could hold an egg off the ground. Our towers were unsuccessful and our hands got sticky from tearing up marshmallows.

After a break we got to make electric guitars out of circuit boards, which we played with. Afterwards we went to a group of engineers who worked for an electricity company called Cummins. We had to make a windmill out of

things on the table to generate constant power for a light house. We then got free plastic bags full of free-bee's and headed of for lunch.

After lunch we designed an app called school tool. This App was like our school planners, but with much more. We showed our app logo to the other groups from other schools then we had the prize giving's.

Only one of the students from our school won a competition which was a competition to win a boom blaster (docking station). After this we left to get back to school.

By Morgan Fifield and Riley Grant

**“We are the original nation of inventors” – Richard Reed
Co-founder, Innocent**

ENGINEERING EXCELLENCE



As a school we are very proud of the engineering excellence that our students show on a regular basis.

During this last year students have taken the opportunity to take part in Smallpeice residential courses, apply for the prestigious Arkwright award and complete engineering challenges both in school and out.

The work that they do should be recognised and so we have launched the Bloodhound SSC Education Centre Engineering Excellence Award.

This will be an annual award presented to a student from WGSB who has shown a high level of engineering skill and commitment both in and out of school.

Jo Finch, Education Animator and Ambassador Trainer for the Bloodhound Project, came along to our presentation evening in July and was introduced to Joshua Brown, the first recipient of the new Bloodhound award.

Josh is always engrossed in engineering projects around

the school. He designed the Engineering Focus Website, he has attended the Trevithick Industrial Heritage Days making microsteam cars and stirling engines and undertook the daunting task of assembling the Rapman 3D printer that we were given by Bits from Bytes when we became the South east Bloodhound SSC education centre.

We are currently looking around our students to see who it should be awarded to next year.



INTERESTED?

The following opportunities exist for students from **Wilmington Grammar School for Boys**. Have a look and if you are interested in taking part in any of the events or activities either go to the website to find out more or see Mrs Smith in DT.



STEM Leadership

These nationally recognised awards are open to students from Years 1-13 so everyone can get involved.

To apply for the award you must take part in a STEM related activity, interview a Scientist, Technologist, Engineer or Mathematician and write a report about the interview and send the report along with a letter of application to Primary Engineer, the organisation that oversees the award. Finally you must take part in at least one activity where you can help students your age or younger take part in a STEM activity and there will be lots of opportunities for you to help during the year.

If you are interested you can get more details from <http://www.leadersaward.com/index.php> then talk to Mrs Smith about registering.

Smallpeice Trust

From Marine Technology to Low Carbon Energy Challenge, our courses are as exciting as they are varied. And they all offer young, aspiring engineers the chance to connect with industry professionals and technical specialists. Based at some of the country's leading universities and other secure venues across the country, courses are available to young people in school Years 9 - 12. This isn't stuffy, dull classroom work - in fact, many students tell us how intriguing, inspiring and surprising they found their event.

These are residential courses and details can be found at <http://www.smallpeicetrust.org.uk/> look for the residential course tab.

Primary Outreach Work

During the year we visit local primary schools to run STEM projects with Key Stage 1 and Key Stage 2. I need students to come along and help me run these activities and I am always looking for volunteers from any year group. This is particularly helpful if you are applying for the STEM Leadership Award with Primary Engineer. If you are interested in helping out or would like more information please e-mail me at esmith@wgsb.org.uk

Reporters Needed

Our primary schools visits are rarely included in our Engineering Focus Newsletter and I would also like to increase the Primary content on the Engineering Focus website, to do this I need to take one student to each activity who is responsible for getting photographs, video footage and quotes and feedback from the students taking part in the activities. If you are interested please e-mail me at esmith@wgsb.org.uk

Nuffield Bursaries

Nuffield Foundation Science Bursaries offer up to 1000 bursaries a year, for students to work alongside practising scientists, technologists, engineers and mathematicians, projects take place during the summer holidays, giving students an insight into the world of scientific research and development. Students in the first year of a post-16 science, technology, engineering and maths (STEM) course are eligible to apply for a bursary of £80 per week to support them during their project.

For details go to <http://www.nuffieldfoundation.org/science-bursaries-schools-and-colleges>
Be aware there is a deadline for applications -

Arkwright Scholarship

The Arkwright Scholarships Trust administers one of the most prestigious scholarship schemes in the UK. We identify and nurture future leaders in engineering and related areas of design. We do this by awarding Arkwright Engineering Scholarships, through a rigorous selection process, to high-ability students in Year 11. Our Engineering Scholarships support students through their A Levels and encourage students to pursue engineering at university and to take up careers in engineering or related areas of design.

For more information go to <http://www.arkwright.org.uk/>
Their is an Arkwright activity running in January in Medway, if you are interested in this opportunity you must see Mrs Smith by the end of October.



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