

Engineering Update

April 2011

This has been another event packed term. Engineering focussed enrichment activities have been available for all year groups in KS3 and KS4. Year 10 students have had a double helping with both the National Grid / Smallpeice Trust Engineering Day and the Women in Science and Engineering Day.

This term has also seen more support from companies which is excellent in these economically challenging times. Stephen James BMW have provided industrial visits for our engineering students as well as completing at least 5 hours of welding for the Greenpower car which is well underway. Lego Education have provided huge amounts of kit which we are keen to put to effective use and the National Grid have sponsored an Engineering Day at Newstead as well as the opportunity for eight students to participate in a week long residential work experience at their Newark Training Centre.

Jenny Wright – Head of Engineering

LEGO SPONSORSHIP COMES TO NEWSTEAD

We have recently agreed a fantastic sponsorship deal with Lego Education. The aim of this arrangement is to develop the use of Lego as an applied learning tool throughout our curriculum as well as that of our partner schools.

Our engineering suite is to be renamed the Lego Innovation Studio and we are to stock it with Lego kits to the value of more than £20000. These kits will include:

- Lego Mindstorms
- Machines and Mechanisms
- Renewable Energy Kit
- Lego Education Wedo

along with a wide selection of Duplo and other resources suitable for infant groups.



Some of this resource will be available to loan by our partner schools or for Lego centred community based activities.

If you would like to find out more about this scheme and how to gain access to this fantastic resource please contact Jennifer Wright at the email address at the bottom of this page.



A LEGO NXT based robot model

IN THIS EDITION



BIG BANG FAIR



ICE CREATE
SPORT CHALLENGE



WISE EVENT



ENGINEERING AT
WORK DAY



SUSTAINABILITY
WITH ELLEN

AND MORE...

SCIENCE AND ENGINEERING FAIR GOES WITH A BANG

In March Year 8 had the exciting opportunity of attending this year's Big Bang Young Scientists & Engineering Fair, the UK's largest single celebration of science, technology, engineering and mathematics for young people at London's ExCel Centre.

The Big Bang 2011 brought together 120 different organisations with the shared aim of "inspiring the next generation of scientists and engineers". It represented an unparalleled partnership between Government, education, industry and the wider science and engineering communities.

It was a fun filled day where students were able to visit hundreds of exhibits in the NeXt Factor, Go Global, Energise and Body Talk zones. There they found out more about biodiversity, medicine, conserving resources, challenges facing the global village and how our future is shaped by innovation. The students took part in the many different activities and experiments, such as invisible cloaking, examining algae, building spaghetti bridges and how to build a bionic man, to name a few. They were able to liaise with many scientists and engineers and question them in order to discover more about a wealth of science and engineering disciplines. All students attended a workshop at the 'Wallace and Gromit's world of invention' road show. They also saw many of the inspirational and innovative STEM projects produced by young scientists & engineers from schools across the UK, who entered the prestigious National Science & Engineering Competition.

In the afternoon the students were the audience for the fantastic headline show BBC's Bang Goes the Theory. They watched the team live on the stage to test, stretch, explain and experiment with science and how it shapes the world around us. Experiments / Investigations included: which out of boiled sweets and toffee would make the best glue, how we could potentially deal with the greenhouse gas methane in such a way that we can reduce the greenhouse effect and global warming. The students also found out why eating insects may be the way forward in curbing global warming even nominating two of Newstead's science teachers to taste a few on stage!

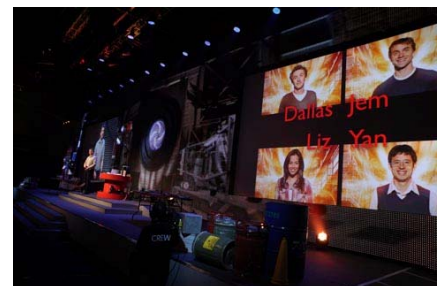
Year 8 returned loaded with bags of Freebies and enthused about science and engineering having thoroughly enjoyed their time at the fair. It was a fantastic opportunity highlighting how Scientists and Engineers will be at the forefront of addressing the challenges of the future.



Wallace and Gromit's World of Invention Road Show



A Photo opportunity with Wallace



Bang Goes the Theory Live

NATIONAL GRID SPONSOR YEAR 10 ENGINEERING ACTIVITIES

The Smallpeice Trust and the National Grid have joined up in their endeavour to inspire more young people about what engineering has to offer. In January representatives from these two organisations came to Newstead to run two half day practical workshops with a focus on alternative energy. A total of fifty year 10 students were involved their brief being to design and make the most efficient wind turbine.

The workshops tested participant's team building, problem solving, communication and creative skills. At the end of the day six students were selected to attend a week long residential work experience at the National Grid Training Centre, Newark in March. Congratulations go to the successful students; Anna Shenton, Georgie Croft, Ugo Agbai, Charlotte Law, Erica Douglas and Adeola Anjorin.

Opposite is a brief report on Ugo Agbai's residential experience with the National Grid.

"As I hadn't focussed my studies on Engineering in the past I was grateful for the opportunity to explore this discipline but had no idea what to expect.

After arriving and checking into a fantastic room I got to meet who I would be spending the week with. Each of my team was from a different school and after our initial conversations we realised how much we had in common. Before the week I was worried that I would be bored during the working element. However every activity seemed to grab our attention, whether it was the 'Electricity Demand for Casting' activity (which we won!) or the 'Future of Energy' lecture (surprisingly much enjoyed) or the 'Jointing on Overhead Lines' practical.

We also had two site visits to see engineering in action and on the Thursday we worked on 'the Big Challenge' to light a bulb using a wind turbine mounted on towers that we constructed ourselves. This week provided me with new skills and challenged those that I already had. It definitely opened my eyes to what engineering is."

YEAR 8 DEMONSTRATE ARCHITECTURAL SKILLS IN CREATE SPORT CHALLENGE

A group of Year 8 students have been working in three design teams with Institution of Civil Engineers (ICE) Ambassador Engineers from Arup, Mott-MacDonald and Atkins Global on the Create Sport Challenge, a national Architectural/Engineering competition run by the ICE. The brief is "to design and model a community sports venue". Participating teams are required to write a project report, produce an A3 poster to publicise their team's sport centre and produce a 3D model. Working with the Engineers has provided all students will insight into the real world design process and the importance of good communication when putting together a project proposal. We would like to thank Stephen Hudson (Arup), Sarah Clayton (Mott-Macdonald) and Wales Cheung (Atkins Global) for the time and enthusiasm that they have dedicated to this project. We would like to wish all of the groups luck in the regional and national heats.



**Team Lakkel's
Concept Model**

"On the first week of the project we listened to each other's ideas but didn't always agree on all of them. However, we did agree to locate our building in Singapore because of the all round sunny weather and although there are lots of tourists, they are often just stopping off after a long flight and need to keep fit for the next stage of their journey. Over the weeks we have been developing the design of our building, experimenting with Google Sketch Up and have settled on cone-like shapes and lots of bright colours to attract the tourists."

Report by Team 1- LAKKEL: Kemi, Adithi, Kate, Leah and Lorenza

"The inspiration for our sports centre has been the shape of a chef's hat. We would build the centre in Tubbenden Park to improve the sports facilities locally and help the community become a better place. We have all been working on different aspects of the design and pulling together our final idea, even though we all come from different forms. Create Sport has certainly helped our team working skills".

Report by Team 2- Zoe, Prerana, Sophie, Annie and Sophie

**The Chef's Hat is a
dominant feature
of Team 2's Design**



"We have decided to locate our sport centre in Hastings because the pier burnt down recently, this would be an ideal opportunity to rejuvenate Hastings as a holiday location. Through our research we found there aren't a sufficient number of sports centres in the area and only one swimming pool.

Our original shaped building has been inspired by a sea shell and will use metal supports for the frame and recycled glass for the outside. It will be designed for tourists and the local community with swimming lessons for schools, the disabled or elderly supported by our specially trained staff. There will also be a café on the upper floor and in the summer its iconic shape will attract many tourists to the Hastings Pier."

Report by Team 3 – Laura, Charukshi, Olivia, Harriet and Orlaith

ENGINEERING SOCIETY PRESENT AT SSAT ENGINEERING CONFERENCE

You may remember that last year four members of the Engineering Society (Lily Webb, Nina Sridhar, Rachel Da Costa and Amy Chen) travelled to Venice with students from three other Engineering / Technology Specialist schools to explore the innovative engineering and technological developments that are helping to protect Venice from flooding and 'sinking'.

After the visit students from all four schools, which are dotted around the country, worked collaboratively to produce a report to illustrate how the visit enhanced their learning and how it could enhance the learning of students studying STEM subjects and in other areas of the curriculum. These students presented their report at this year's Specialist Schools and Academies Trust National Engineering Conference.

By doing this the students were at the forefront of promoting engineering opportunities in schools to teachers, lecturers and leading companies.

RAPID RESPONSE CHALLENGE

During Enrichment week Year 9 took part in the 'Rapid Response' challenge. This day was all about Civil Engineering and the importance of the work of Engineers in the event of natural disasters.

Engineers who are based in London but work abroad led the day and challenged our own engineering skills. We were set the tasks of building a shelter from 5 bamboo sticks, a plastic sheet, sellotape and string and an irrigation system out of: three half drainpipes, four little bamboo sticks, a bucket, sellotape and string.

The best bit was getting into the tent and having people throw buckets of water at you to see whether or not it's waterproof, lots of people were soaked! This was one of the best enrichment week experiences.



Report by Scarlett Jenkins Year 9

WISE DAY A HIT FOR THE 2ND YEAR

For the second year in a row Enrichment Week saw a range of companies descend on Newstead for the Women in Science and Engineering Day.

Engineers from Doosan Babcock, Ramboll UK, Bovis Lendlease, UK Power Networks, the Smallpeice Trust and the University of Surrey challenged year 10 students with a wealth of problems ranging from quantity surveying, to construction, from planning energy supplies to making ethical engineering decisions and from making wind turbines to building balloon rockets.

The day concluded with an inspirational lecture by Dr Kathryn Harkup from the University of Surrey which covered topics including Gecko Gloves and Zombies.



Planning to meet our future energy need with Doosan Babcock



Designing Balloon Rockets with Kathryn Harkup

GREENPOWER CHALLENGE UPDATE

Termly update by Veridity Girls Racing Team

Manufacturing: The manufacturing team have now produced a car mock up, which has aided us in making final adjustments to our design. The measurements we have taken from it will ensure our car will be the right size, and will be comfortable for all of our team members to drive. With that complete, we have started manufacturing the mild steel framework for the car, including the roll hoop and chassis.

Finance: So far this year we have raised £1000 in cash, and are benefiting from a range of other forms of sponsorship including; wheel building, welding, spray painting service, material supply and machining work. We will also be offering students and teachers the opportunity to sponsor us small amounts for getting their names printed on the car. All of the sponsorship is helping significantly with car production, as we are able to afford most of the components and materials necessary for manufacturing. We would like to thank our sponsors who include:



Chassis under Construction

- RP Martin Brokers
- Renault, Orpington
- Weaver and Co.
- Jack Petchey Foundation
- Cycles UK, Orpington
- Stephen James BMW
- Middlesex University
- Brompton Bikes
- Bigfoot Bikes, Hayes

With a special thank you to Network Rail Engineer Peter Fagg.

BIKE FOCUSED ENGINEERING AT WORK



Making a pedal-powered smoothie

Changing the back wheel



Year 10 and 11 Engineering Diploma students enjoyed working alongside fellow engineers from Langley Park School for Boys at Bromley Education Business Partnership's annual Engineering at Work Day.

After an ice-breaking initial spaghetti and marshmallow tower challenge students got stuck in to the main activities for the day which all involved something to do with a bicycle. The key focus was bike maintenance and students learnt how to change wheels, fix brakes and identify bike parts. Other challenges included making fruit smoothies using pedal power and the Brompton challenge to determine who could put up a Brompton bike in the quickest time possible.

Great fun was had by all and thanks go to the Bromley Cycle Safety Team and Bromley EBP for organising the day.

PROJECT REDESIGN WITH DAME ELLEN



Year 12 Engineers and Environmentalists found Ellen MacArthur inspirational

In February six year 12 students visited the Burlington Danes Academy in west London to participate in a Project Redesign Workshop hosted by Dame Ellen MacArthur. We learnt about sustainable living and how future generations will be affected. The concept of a closed loop economy, seen as a more a positive approach to the sustainability problem, was discussed in detail.

We enjoyed the day and were particularly inspired by Ellen and her determined yet positive approach to the challenging issue of sustainability.

Report by Imogen Scott Year 12

IN BRIEF

Young Engineers' Eggs Factor Challenge

Following on from our success in last years Eggs Factor Challenge, we now have several teams from Year 8 registered to participate in this year's challenge.

Students are required to design and build a unique air transport mechanism with the aim of flying a quails egg the maximum distance possible. To achieve maximum marks, designs must incorporate design features drawn from nature, i.e. biomimicry.