

# Engineering Update

## Summer 2008

This summer marks the end of our first four years as a Specialist Engineering School and its achievements are significant. The fact that Newstead will be Bromley's lead school for the pilot of the Engineering Diploma from September is testimony to this.

Our core purpose has been to develop the inherent engineering skills relating to teamwork, thinking, problem solving and creativity. Such attributes are manifest at Newstead in both the curriculum and in the many extra curricular opportunities that provide challenges for our students.

There have been important cross curricular developments within the core engineering subjects and with other subject areas. The range of activities provided for our community partners is most impressive and the involvement of our students in this outreach work provides important leadership opportunities for them. Above all there is a real engineering ethos at Newstead. We are 'flying the flag' for women in science and engineering. Congratulations to the whole team under the outstanding leadership of Jenny Wright, Engineering Development Manager.

*Christine Lloyd, Deputy Head Teacher*

### EES TEAM TASTE TV STARDOM

One of Newstead's two teams from this year's Engineering Education Scheme (EES) were filmed and interviewed recently for a pilot science / technology based TV programme, provisionally titled 'Young Einsteins'.



**Rehemat Bhatia, Hannah Southan & Katherine Redhead in the spotlight**

Filming took place at the BA Crest Awards South East England Regional Finals, held in the beautiful setting of the Royal Botanic Gardens Kew, Millennium Seed Bank at Wakehurst Place, Ardingly.

Having already achieved a Gold BA Crest Award for their DSTL mentored EES project work, the team were then invited to present their project - a self levelling, multi-spectral beacon used for testing the range of binoculars and night vision equipment - at the Regional finals held on the 26<sup>th</sup> June.

Undergoing intensive interviewing by two sets of judges, the team did exceptionally well in achieving second place at the regional finals, and our congratulations go to them.

### IN THIS EDITION



**BA CREST AWARD  
REGIONAL FINALS**



**FORMULA SCHOOLS  
HIT SILVERSTONE**



**RAPID RESPONSE FOR  
ENRICHMENT WEEK**



**MANUFACTURING  
STUDENTS VISIT SEM**



**NEWSTEAD STUDENTS  
SAVE OUR SEEDS**

**AND MORE...**

## FORMULA SCHOOLS TEAM HEADS FOR SILVERSTONE

Formula Schools is a National competition for secondary pupils to develop their engineering and entrepreneurial skills by building and racing an eighth scale radio controlled car, run on bio-fuel.

Involving months of preparation and practice, the competition proper began on the 15<sup>th</sup> May with the regional pre-race day judging, where teams set up a display and were marked on their engineering development and fund raising / sponsorship work.

The competition culminated this year on the 12<sup>th</sup> June in a race day at the Silverstone racing circuit in Northamptonshire, the home of Formula 1 racing. As well as proving their car in a race environment, teams were awarded points based upon aspects of Engineering, Body & Aerodynamics and Teamwork.

This year's competition proved as exciting as ever, with our five member 'Linear Motion' team achieving a credible 19<sup>th</sup> position out of a total of 30 entrants under the methanol experts category.



**The Linear Motion team: (l-r) Rehab Khan, Shobika Mohamed, Celine Lee, Jola Adeyemo & Sibylla Kalid**

## ENRICHMENT WEEK BRINGS NEW EXPERIENCES FOR NEWSTEAD STUDENTS

### Rapid Response Challenge

Wet and windy weather rather aptly greeted the participants in the Rapid Response Challenge, run during March as part of this year's Enrichment Week.

Working in teams, girls took on the role of disaster relief workers and were tasked with erecting temporary shelters and makeshift water supply systems.



As in a real world situation, materials available were limited, comprising bamboo sticks, plastic sheeting and cut up drain pipe only. The resulting structures were subject to rigorous marking in order to select a winning team.

**Newstead Girls save the day**

### Year 7 Architectural Design Competition

The Architectural Design Competition is an annual competition in which year 7 students are given the following brief:

*"To design and model a new building intended to occupy a site along the banks of the River Thames between Westminster Bridge and Greenwich or the Docklands area."*

The competition is designed to develop the students' problem solving and creative skills within a technical context.

Preparation for the competition began in January. During Enrichment Week in March, all Year 7 students spend a day in central London in order to appreciate the existing architecture.



This visit included a riverboat trip from Festival pier to Greenwich, to review the riverside buildings with the aim of designing their own addition to the skyline.

This was followed up with a half day architectural modelling workshop in school. The students then worked independently to produce their competition entries, which consisted of a model building and a folder recording the development of the design work. This year's entries were very impressive, and after considerable deliberation our congratulations and trophies went to:



**The winners (l-r) Isobel Ivory, Eleanor Pike & Pooja Patel...**



**...and the winning entry**

### Faraday Engineer Visits Newstead

Year 10 students were fortunate enough during Enrichment Week this year to receive a talk from a Faraday Engineer. Ola Youssef, an electrical engineer, gave an informative talk to the students about her career, sharing her experiences and the different entry routes into engineering.

In particular Ola talked about the types of projects she was working on and her day to day roles. The students followed up the talk with an engineering project called 'World Water' where they designed a water conservation system as part of a sustainable eco home.

## COMMUNITY NEWS

One of our aims as a Specialist Engineering School has been to share our commitment to science and technology with the wider community. This includes the families and friends of parents, staff and governors of both Newstead Wood and our partner schools, together with the school's immediate neighbours. Below are just some of the activities carried out.

### COMMUNITY LECTURE PROGRAMME

We are delighted with the support we have had for these sessions, not surprising in view of the excellent speakers who have been able to strike just the right note for audiences that range in background, age and prior knowledge. Topics have reflected some of the many aspects of engineering: Professor Andrew Fisher from University College London was our first speaker and provided a fascinating insight into nanotechnology and the effect it is likely to have on the boundaries of science and technology. Brunel In Person was aptly titled when Robert Hulse, Curator of the Brunel Engine House, assumed the role of Isambard Kingdom Brunel and shared his achievements with us. From the future of rail transport in Britain to the practicalities of space travel, Professor Roderick Smith and Alexander Martynov respectively enlarged our understanding with regard to these dimensions in engineering. Back on firm ground Victoria Thornton, Director, Open House, raised awareness of architecture and the built environment.

It has been a joy to welcome such fascinating and inspiring role models for engineering to Newstead. They have certainly contributed to our core purpose of broadening horizons in respect of the many aspects of the application of science that engineering entails.

### NASH CLUB

Nash club is well established at Newstead. Organised and run by students from years 12, 11 and 10, this club provides our girls with the opportunity to develop their leadership, organisation and creativity through the design and delivery of a fun and educational programme for the young adult participants.



**I see no ships!**

producing and performing a play, a treasure hunt, making creative plant pots, musical composition and designing a range of gift cards.

Nash students thoroughly enjoy the activities and have built up excellent relationships with our girls (the club is oversubscribed!). Thanks go to all the students (too many to mention) who regularly demonstrate their commitment to this valuable community activity.

## COMMUNITY WORK - PRIMARY & SECONDARY

This summer we are working with 16 classes of year 5 and 6 students on a range of projects developed in collaboration with primary school staff. The projects are designed to enhance and enrich the primary curricula in science, design and technology and engineering through the provision of specialist advice and resources. Newstead students from year 9 work alongside teaching staff to aid with the delivery of these activities. This helps to develop their technical understanding, and communication.



**Making buggies and evaluating propulsion methods at Crofton Junior School**

**Team based mobile making project with Perry Hall Primary School**

**Tubbenden Junior School learn forensic skills with 'CSI Newstead'**



**Farnborough Primary students making a cam based pop-up toy of their own design**



**Red Hill Primary students learn about speed as part of their buggy project**

Students from our partner secondary schools (Prendergast and Ravens Wood) participated with our year 9 gifted and talented scientists and mathematicians in a Smallpeice Trust STEM day held at Newstead in March. The brief was to design and manufacture super capacitor powered cars. This exciting opportunity provided students with an insight into both electrical and mechanical engineering.

## MANUFACTURING STUDENTS VISIT LOCAL ENGINEERING COMPANY

A group of seven Year 10 students undertaking the Manufacturing VGCSE were recently given the opportunity to see a real manufacturing facility 'up close and personal' during a visit to SEM at Orpington.

SEM designs and manufactures a range of servo-motors for a wide variety of uses. Their products appear in such applications as desktop computer controlled milling machines, through - on a much larger scale - to wind turbines (where they can be used to set the angle of the turbine blades).

Hosted by manufacturing engineer Justin Brooks, students were able to view a wide variety of manufacturing, production and test processes in action.

Of particular interest were the company's efforts to establish assembly cells aimed at reducing a product's 'in work' time, as well as their efforts to ensure the quality of their products through their implementation of Total Quality Management.



Our thanks go to SEM for enabling this visit.

**Manufacturing students being shown one stage of the production process**

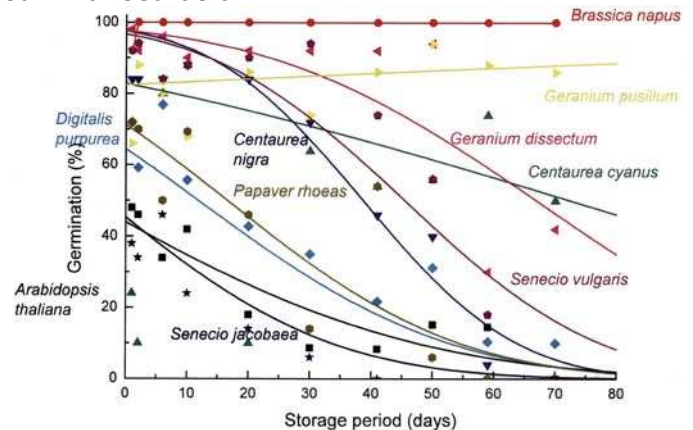
## NEWSTEAD STUDENTS SAVE OUR SEEDS

Newstead Wood recently participated, along with 39 other schools nationally, in the Schools' Seed Longevity Project run by scientists from the Millennium Seed Bank (MSB) at Wakehurst Place, Ardingly.

Biology students in year 12 worked with MSB scientists to find out which of the UK species produce seeds that are short-lived and which produce seeds that are long-lived.

The seeds were 'aged' at a much higher moisture content and a much higher temperature than they are stored at in the MSB: it is thought that one day of 'aging' is equivalent to 8 years in the MSB. Samples were taken at different times of aging and a germination test carried out.

The results of the Newstead's research group are summarised below:



More information on this project can be found at:  
<http://www.kew.org/msbp/saveourseeds/index.html>

## IN BRIEF

### Go4SET

Congratulations go to Lianna Smith, Nancy Ellis, Genevieve Almond and Kelly Davey who attended the Go4SET celebration and assessment day at the University of Kent in March. Their design for a rainwater harvesting system won the award for the 'most sustainable product'.

### Mission Virgin Galactic

Staff and students from Newstead have worked with Virgin Galactic in the development of the Mission Galactic competition which was launched in April. Details of this exciting competition, open to all students, can be found at [www.missionvirgingalactic.com](http://www.missionvirgingalactic.com). The prize is to travel to California to see Spacecraft 2 take off at Mohave spaceport - a once in a lifetime opportunity!

### Web Site Update

Those interested in engineering and who have not recently visited the Newstead Wood School web site may like to view the engineering section, which has now been updated with useful links to careers in engineering and the many diverse routes that can be followed. In particular, students can access a link called 'Role Models' where female engineers talk about their chosen career in the engineering fields.

Our URL is <http://www.newsteadwood.bromley.sch.uk/>

### 2008 Summer School Takes Flight

*Flight : A Leonardo Question Answered* is our summer school theme this year. Activities will include a rocket building challenge, enabling students to identify some initial questions relating to the design and manufacture of aircraft. At the Imperial War Museum, Duxford, they will enlarge their understanding through close observation of the museum's impressive collection of exhibits. Workshops led by the Aeronautical Engineering Department, Imperial College London will focus on building and testing wing sections. We were awarded a Rolls Royce merit award for this innovative work.

### Engineering At Work

In March, twenty Year 9 students worked with boys from Langley Park school to design and make a water supply system as part of the engineering at work day at Bromley Education Development Centre. The activity leaders, Thames Water, were impressed with the girls' ability to plan carefully, within the constraints of time and budget.

### Arkwright Scholarship Successes

We congratulate Laura Gardiner, Alex Rogers & Rachael Williams on achieving this prestigious award. We wish them well at the awards ceremony in October.