

nuast

**Nottingham University
Academy of Science
and Technology**

Newsletter

June 2017

Welcome

Welcome to our summer term newsletter. This is a busy time of the year for all of our students as they undertake their external examinations. It is a period of hard work for students both in school and with home-based revision. Teaching staff have provided and continue to provide excellent support to our students and I hope that each student will be rewarded with the grades that they deserve on results day. I would like to thank parents and carers for their help and support in preparing their children for the summer examinations. The support that each of you give to your children is of paramount importance and is a real feature in their future success.

As you will see from the newsletter, it has been a busy period at NUASt. It is very pleasing to see the success of our students in activities such as maths challenge, the RS Components Business competition and VEX robotics competition. Our students are able to access excellent support through our links with local employers and the university. Destination information for the Year 13 students who will be leaving us this year is very encouraging with all students moving to university, higher apprenticeships or employment. 25 students have received offers for study at The University of Nottingham and a further 20 have received offers from Nottingham Trent University. Course choices include areas such as Medicine, Veterinary, Physics, Forensic Science, Chemical Engineering and Product Design.

NUAST has very talented and committed students. I look forward to results day with interest and wish every student success as they move forward with their studies.

Mr Robert White
Principal

Year 11 theatre trip



Over the Easter holidays, a group of NUASt students in Year 11 went to the Theatre Royal in Nottingham. They saw the award-winning play *The Curious Incident of the Dog in the Night-time*, based on the novel of the same name and which is one of their key texts for English GCSE Literature.

The plot follows a teenage boy as he goes through a traumatic period in his life which eventually leads him to run away from home. All of the play is shown through the lens of the boy's Autism which dramatically impacts how he interprets the world and people around him. It uses a stunning array of technical effects and equipment to help bring to life the challenges he faces and raises the understanding and awareness of this often misunderstood disorder.

The Year 11 students had a great time and enjoyed seeing their GCSE text come alive. They all felt it would really help them answer their exam questions in May.

Fantastic fundraising by Year 10 and 11 students



During the Autumn term, Year 10 and 11 students raised money for local children's charity PASIC (Parents Association for Seriously Ill Children). PASIC is a local charity that supports the families of children and young people with cancer, at the Nottingham Children's Hospital, Queen's Medical Centre. They have no overheads and are run entirely by parents and volunteers; as a result of this, PASIC are proud to say that every penny raised will make a real difference to the children being treated at the QMC. PASIC offer a range of support to children with cancer and their families, ranging from grants to support with travel costs and bills where parents have had to leave work to special events for the children, such as a Christmas party for children spending the holiday in hospital.

Louise Whittle, PASIC Operations and Fundraising Manager, came in to present the group with a certificate and a card, thanking students for the £207.85 that they raised in the Autumn term. She took part in a brief interview with students to explain how the money raised would be spent. PASIC will be using the money raised by NUASt students to put together activity packs for the children to use while in hospital, to provide something fun during an otherwise difficult hospital stay. Louise and her team were keen to use the money for something that would have a positive impact on as many children as possible.

A big thank you to all the students who helped raised such a fantastic amount for this worthwhile charity.

Year 10 enrichment

Year 10 students participate in a range of interesting and engaging activities as part of their Enrichment programme on a Monday from 3.00pm to 4.30pm.

Students opt into an activity that they feel will enrich and challenge them and they are all run by our NUASt staff. Here are a few examples of students enjoying their enrichment activities below:



Students completing forensic experiments



A Spanish session being led by Mr Ballester



A robotic elephant with its very own Lego dumb bell made by Ella Sutherland



Students working on producing their own robots from Mindstorm Lego.

Success for Sixth Form students as part of their enrichment programme

Six hard-working students were rewarded at a presentation of certificates, following their success in the recent London College of Music exam session, held at Nottingham High School. Taking a course of study over two terms, part of the sixth Form Enrichment programme, the group learnt the skills required for public speaking: confidence, projection, clear diction and vocal variety. Then, as part of the Grade 4 Oral Communication exam, they delivered a short speech on a hobby or sport, gave a reading from a novel of their choice and a mystery reading chosen by the examiner. All had prepared a folder of work with 12 own choice pieces on a linked theme connected to their talk. The topics varied wildly: Lucid Dreaming, Fact Collecting, Scrapbooking, Football and War Sonnets, all

beautifully presented and with a personal reflection on the value of the project. The examiner delved deep in his questioning on the folder, the reflection, and their knowledge of performance technique—the art of giving life and colour to speech and capturing an audience’s attention. All this was covered in a 20-minute one-to-one session with the examiner.

The results were a tribute to the effort they had put in. With 65% required to pass, they were delighted to find that three had been awarded 82% and a Merit certificate and the other three 85% and Distinction!

Laura Haggarty, Ahmed Madibo and Abdullah Menacer were awarded a Merit and Christine Monk, Rebecca Hennessy and Mustaqueem Shiffa were awarded an outstanding Distinction.

Congratulations to everyone including voice coach, Janice White, who was offering a new and untried course of study.

NUAST students reach the Young Enterprise and RS Components final



In May, six Year 10 students were selected to take part in a competition run by RS Components and Young Enterprise. RS Components are a global supplier of industrial tools and have designed an RS truck that travels around the country to engage with students and the public on all things engineering or supply chain related.

The students were competing against other Nottingham schools and had to complete a series of activities that enabled them to use their team work skills, business studies knowledge and practical engineering skills. The main part of the competition involved having a tour around the RS Truck to view its facilities, and to gather information on how they felt the truck could be improved to enhance the ‘customer experience’. The team had to be creative as well as practical and suggest improvements to the truck to the product manager at RS Components. The students all had to present their team presentation to the rest of the groups and representatives from RS Components and Young Enterprise.

Our students did an amazing job at presenting some fantastic and innovative suggestions on how the truck could be improved and used their engineering and business skills to produce a winning presentation that has resulted in them getting through the regional heats to the main final which will be held at Loughborough University in June, where the students will have to improve their innovation pitch and present back to a judging panel.

VEX Robotics final at the NEC for Year 12 Computing and Engineering students

VEX Robotics is an international competition entered by dozens of countries around the world and hundreds of teams. The competition involves teams building a robot to compete against others in a pre-determined challenge. This year’s challenge was to pick up stars and throw them in to the opposing team’s half of the arena.

As part of their Enrichment programme, Year 12 Computing and Engineering students created their own robot which they used to enter our regional final and won. This meant that they qualified for the national final.

The national final was at the NEC in Birmingham where 40 teams from the UK competed over three days. The students didn’t win but they performed and represented NUAST brilliantly and are now even more determined to win next year. This year the International Final is in Kentucky and their aim is to reach this stage in 2017-18.



Year 12 students with Mr Ward, Deputy Head of Post 16, with their robot at the NEC.

A Maths Challenge for Year 11

On Tuesday 9 May, a large group of Year 11 pupils went to Nottingham University Samworth Academy (NUSA) for a day of mathematics revision. Over the six hours, pupils had an immersive mathematical experience with revision of common exam concepts coming thick and fast. According to Leona Williams; "It was a challenging experience but enjoyable." "It was so good; I really learnt so much," Martyna Klosinska said at the end.

Mr Launchbury worked with those pupils who will be sitting the higher paper and described them as the best group of students that he had worked with. They were equally positive about what they had achieved. All pupils gained experiences that will mean extra marks when the exams finally come around.

A big thank you to NUSA for hosting the event and to all the staff that ensured it was a rewarding day.

Science enrichment

During science enrichment this term, Year 10 students have completed the Open University certificated course on 'Basic Science: Understanding Experiments', which includes applying concepts to solving world problems. For example, the students explored the concepts of osmosis for solving world hunger and densities of materials for global warming. Each session included a practical session which developed skills of pattern finding, and then they had to relate it to conclusions.

For the second half term students were given a choice of an activity, with pupils from the last two groups opting for forensics. Different crime scene investigation scenarios were analysed weekly with pupils examining the evidence and understanding the process. DNA, blood splattering, foot prints, chromatography, arson cooling curves and how maggots infest bodies. We are hoping to culminate the work with visiting the Murder House at Nottingham Trent University.

Sixth Form Biologists bid for new start-up companies

Year 12 and 13 students were part of a research group for new start-up companies who are looking to use ground breaking technology. Students looked around The University of Nottingham research facilities, including seeing stem cells turned into cardiomyocytes which were visibly beating. The companies involved were:

- **TriaGen Ltd** is developing encapsulated insulin secreting cells to treat type 1 diabetes.
- **NeuralHeal Ltd** is genetically engineering cells to treat Huntington's disease.
- **PaceYourCells Ltd** is creating pacemaker cells to treat cardiac arrhythmia.

Our students then impressed the university by creating thoughtful and focused presentations on their practical experiments. There was a prize for the top presentation which went to Doha Basiouni. We are now encouraging students to flex their brain in the Biology Olympiad—brain over brawn!

Year 13 discover more about electron microscopes

On Wednesday 10 May, Year 13 went to The University of Nottingham's physics department to learn more about electron microscopes and their application in research, as well as in industry. We were able to access working university laboratories and equipment, as well as meet a range of researchers conducting unique experiments.

Thanks to Senior Experimental Officer and Outreach Officer, Chris Staddon, we were able to see and experience both a STM (scanning tunnelling microscope) and a TEM (transition electron microscope). Both microscopes are capable of imaging with a resolution significantly smaller than that of the wavelength of visible light. This is what sets these devices apart from the best optical microscopes in the world.

The STM we observed in the university laboratory utilises quantum tunnelling to



establish a tunnelling current and can therefore produce an image of individual atoms.

The discussions and questions surrounding a field of research involving near absolute zero temperatures, as well as the smallest measurable distances, was exciting for the A Level students as well as useful as these microscopes are an important part of the 'Turning Points' unit in the syllabus.

Sixth Form Chemists refine their examination skills

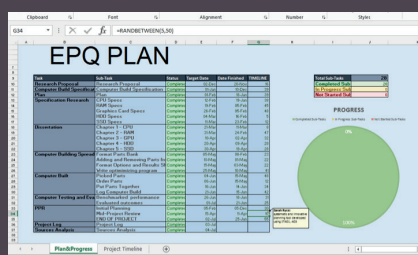
On 2nd and 3rd May, Year 12 and 13 students went to see a lecture given by an experienced AQA examiner on how to improve A Level skills and focus on exam questions in preparation for their upcoming exams. Students looked at the A Level course in its entirety and gained a real appreciation of how the different fields of chemistry (organic, physical and inorganic) link to each other). Students came away with a new vigour for chemistry and a readiness for their exams. We know that this combined with their hard work, will ensure that they are very successful in their forthcoming examinations.

Promoting Independent Research: the Extended Project Qualification (EPQ)

All Year 12 students have the opportunity to do the Extended Project Qualification. It is a fantastic AS level which encourages young people to learn independently and in depth about a topic of their own choice. Students spend around 70 hours of their own time completing it, supported by a supervisor. This year, almost half of Year 12s submitted projects. The quality has been excellent and 30% of them were awarded an A/A*.

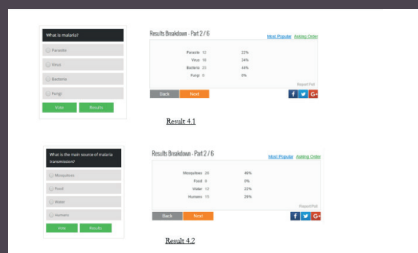
It is clear that students at NUASt have a huge breadth of interest and many students have really pushed themselves to submit work of an undergraduate level. Topics included:

- **How does modern technology allow computers to work?**
By Adam Kulpa (awarded full marks). The outcome of this project was a fully operational computer that was built on a budget to exacting specifications.



Adam designed sophisticated planning tools to manage his project successfully.

- **Malaria has killed billions of people. When will this number stop rising?**
By Islam Bounaceur (awarded full marks). The outcome of this project was a detailed report exploring the reasons for the prevalence of Malaria despite effective available preventions. It then addressed ways forward.



Islam designed a simple online survey to reveal the Sample's knowledge of Malaria.

- **Analysis of secondary data concerning the prevalence of congenital sensorineural deafness and pigmentation in the Border Collie, Dalmatian and Australian Cattle Dog.**
By Francesca Barnett (awarded A grade). The outcome of this project was a report exploring hearing loss in specific breeds of dog. This was enhanced by the first-hand work experience Francesca undertook at a local veterinary hospital.

Congratulations to our Mathematics champions

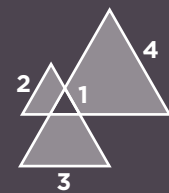
In February, 30 of our Year 10 and 11 students took part in the Intermediate Maths Challenge—a national competition run by the UK Mathematics Trust (UKMT). This is the UK's biggest national maths competition, last year involving around 600,000 students from 4,000 schools from across the country in the three tiers of challenge aimed across the secondary age groups. Students achieving exceptionally high scores can be invited to go on and compete in the Kangaroo competition which has participants from 50 countries around the world.

We are proud to announce an outstanding achievement with a significant number of our students being awarded certification for their performance.

Silver certificates were awarded to Harry Graham, Matthew Flood, Alex Earnshaw, and Matthew Carter. Bronze certificates were awarded to Ella Sutherland, Ahmed Wali, Bradley Shipman, Edward Hodges, Kieron McGee, Marianna Ofomata and Felix Seanor. Congratulations to you all.

You might like to have a go at some of the questions yourself. Here are just a couple:

The diagram shows four equilateral triangles with sides of lengths 1, 2, 3 and 4. The area of the shaded region is equal to n times the area of the unshaded triangle of side-length 1. What is the value of n ?



A 8 B 11 C 18 D 23 E 26

Brachycephalus frogs are tiny—less than 1cm long—and have three toes on each foot and two fingers on each 'hand', whereas the common frog has five toes on each foot and four fingers on each 'hand'.

Some *Brachycephalus* and common frogs are in a bucket. Each frog has all its fingers and toes. Between them they have 122 toes and 92 fingers. How many frogs are in the bucket?

A 15 B 17 C 19 D 21 E 23

And just in case you think this multiple choice system might make for success by lucky guess work, the fiendish ways of the mathematicians at UKMT is to deduct points for wrong answers, so someone simply guessing each answer would expect to gain a final score of zero!

Phenomenal designs by Year 12 and 13 Product Designers

The last term has been a busy one for Year 13 and 12 Product Designers, who have been working on their major project. Students have to design and manufacture a product that solves a real life problem. This year the quality of the work has been outstanding, ranging from modular furniture to arthritic aids to mobile phone charging generators. Students have used NUASt's cutting edge facilities to develop their ideas into reality. The projects are worth 25% of their final grade and the hard work and effort put into these has been phenomenal. Mr Jim Smith, Assistant Principal, who has taught them Product Design this year said, "The A Level Product Design students are a talented set of young designers; it was an absolute pleasure to work with them and finally mark their controlled assessments. They are a very gifted and hard-working group of young people and a credit to NUASt."



A water bottle created by Rebecca Harper.

This water bottle has been fully manufactured at NUASt. The student designed and manufactured a blow moulding mould using the CNC router. Also she has used the 3D printer to manufacture the top and body of the bottle.



A set of arthritic aids created by Erfan Sakhi.

The arthritic aids have been developed using our new ultimaker 3 3D printer that prints two materials at the same time. The learner has used a flexible filament that has been used to grip different products such as bottle tops.



A kinetic phone charger created by Jack Bennett.

A kinetic phone charger has been developed to charge a mobile phone by a winding motion. This has been fully 3D printed where the students has manufacture his own gears system.



A seat and desk module created by Caprice Adjei.

The seat and desk module has been developed to use in a modern office environment. Although it looks simple it has been a complex product to manufacture using free hand routing and large curved moulding processes.



A tablet holder for the elderly created by Suraj Nijjar.

The tablet holder has been developed using 3D printing technology and CNC machinery. It is fully adjustable for a variety of users and tablets to ensure the user can operate it successfully and easily.

Key dates

- Post 16 Induction Day: **Tuesday 4 July 2017**
- End of summer term: **School closes at 1.30pm on Tuesday 25 July 2017**
- Year 10 start date autumn term: **Monday 4 September 2017**
- Year 10 and 12 start date autumn term: **Tuesday 5 September 2017**
- All year groups start date autumn term: **Wednesday 6 September 2017**

**Tomorrow's Scientists
and Engineers**

MADE IN NUAST