Chemistry

Trip to QUB Pharmacy

Alexandra King

Banbridge Academy Triple Award Science pupils got the chance to visit Queen's University Belfast, School of Pharmacy on June 9th 2023 to learn about how medicines and tablets are developed, tested, and analysed, to make sure they are suitable for sales and consumption.

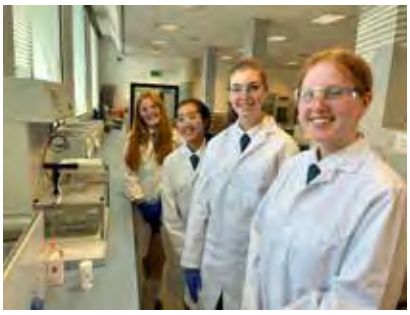
We were given a taste of the 'QUB' lifestyle when we had a university style lecture to display the daily life of a pharmacy student, while also being presented with some of the career choices available to the future generation of 'medicine makers' to assist them with making the choice of which courses they want to do.

The pupils felt very intelligent when we used our triple award course on 'Chromatography', taught by the wonderful Banbridge Academy Chemistry department, to experiment on medicine solutions to find the mystery solution using polar solvents with polar solutions, giving us insight for the topics to come throughout next year's chemistry lessons.

We got to see first-hand how tablets were created, by machine and manually, while also testing them on how they travel and dissolve in our stomachs. The enlightening fact that no medicines or tablets could be distributed unless they are in the 99.9 percentile, gave everyone a sense of ease to ensure that everything is certainly double if not triple checked before it arrives in our hands.

Overall, every pupil enjoyed the very hands-on, informative and interactive day out which showed the many different sectors there are in the pharmacy field. It was a really eye-opening experience, which showcased the multiple sectors to pharmacy while still displaying how enjoyable it is. It also showed how important chemistry is to the world and how it works.

I guess we might need to remember GCSE chemistry for a while then!



Physics

Geneva Trip

On our first day, we visited the United Nations Offices in Geneva and got a guided tour. The UN is an international organisation made up of 193 countries, which work together to find solutions for current issues such as: human rights, health, climate change and violence. People from different countries meet together in the large conference rooms to discuss these topics to try and come to a shared solution. Each conference room is funded by a different country, from which the room is then inspired – the Qatar conference room is inspired by the country's desert sand dunes and Qatari traditions and culture. There is enough seating for each country's representatives, translators and media personnel. The libraries and offices at the UN are for research by UN staff and members, but can also be used by students and the general public to learn about international communities. The buildings are full of artwork representing different ideas and progress in human rights, created by people from different ages, backgrounds and cultures, from artwork made of nails representing darkness into light, to drawings by children representing the Universal Declaration of Human Rights.

On the morning of the third day of the Geneva trip, we visited the Red Cross Museum, situated beside the United Nations. The museum consisted of three separate exhibitions, the first being named 'Defending Human Dignity' which showcased excerpts of the 1864 Geneva Convention and a sculpture of Henry Dunant, a co-founder of the Red Cross movement. Also in the exhibition is the 'Chamber of Witnesses', which showcased testimonies from real witnesses who were affected by war. The next exhibition called 'Restoring Family Links' showed how the Red Cross works to help families reunite after wars and natural disasters. The exhibition showcased a memorial tower with portraits of Rwandan children after the country's 1994 genocide and commemorates the missing people of the 1995 Srebrenica massacre. It also showcased reproductions of the archives of the International Prisoners of War Agency, founded by the Red Cross, from 1914-1923.

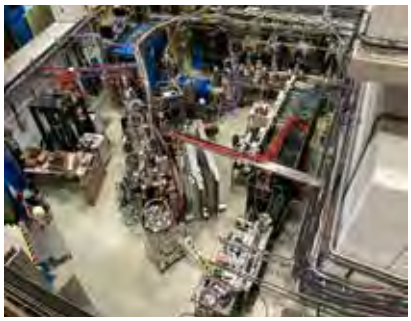
The final exhibition called, 'Reducing Natural Risks' included videos and even an interactive game showing how to prepare for natural disasters and what the Red Cross does in the aftermath of natural disasters. Overall, the Red Cross museum aims at showing how the humanitarian action provided by the Red Cross has helped people of all ethnicities and backgrounds and benefited those affected by various events such as famines, wars, natural disasters, and genocides. The Red Cross Museum was very informative and not only highlighted the difficulties of humanitarian action, but also highlighted the impact that people can have in helping those to overcome these tragedies.

CERN is the European Council for Nuclear Research, home to the Large Hadron Collider (LHC) which is the world's largest and most powerful particle accelerator located 100 metres underground and it is 27 kilometres in length, running through both Switzerland and France. The LHC is best known for its discovery of the Higgs boson particle back in 2012. Before we started our tour, we watched a video on the history of CERN. It was officially founded in September 1954 by 12 different European countries. The first place we saw on our tour was the antimatter factory, where we got to take a look at the antiproton decelerator that produces low energy antiprotons by decelerating and cooling a beam of antiprotons until they are travelling at a tenth of the speed of light. They are then subjected to another deceleration ring known as ELENA (Extra Low Energy Antiproton), which reduces their energy again by a factor of 50. The antimatter made is then used in several different experiments that involve studying antimatter and its properties.

Next we saw the CERN Data Centre, which

Geneva Trip continued

has a massive room in it that is filled with computers used to store and send data from the experiments conducted at CERN. In the Data Centre we learnt about how the World Wide Web was invented at CERN back in 1989 by Tim Berners-Lee and how he created the first website, which was about the world wide web project. CERN was my favourite part of the trip as I really enjoyed learning about the history of CERN and about all the experiments they conduct.



During the course of the trip, we nominated individuals for the following awards:

Keymaster Award
Joshua Thompson
Jackson Sibbett

I can get lost inside
Harry Wan

I hate the colour yellow
Oliver Lewis

I can pose better than you
Caitlin Colgan

I love my yellow hat
Thomas Dean

Oliver hit me one more time
Hannah Kennedy

I don't know how to bowl
Daniel Mackle

I got a half strike for Mr Stewart
Nicole Mrazikova

Best supporting teacher
Mrs Tully
Jake Rainer

I thought I was a photographer
Matthew McAdam

I have got over the formal
Peter McGrath

I hate shoes
Emma Graham

I am hungry and every watch looks the same
Oliver Finlay

I almost didn't get on the plane
Mr Stewart

Work Experience at Atkins Global

Aleyah Peniero

When someone says "Work Experience" what comes to mind? Something you can put on your CV? An insight into your future career? A chance to learn something new? Or do you think it's just like working, but instead of being paid in cash you get paid with experience? Whatever your thoughts on "Work Experience" may be, here's how my placement at Atkins played out for me. For those of you who have never heard of the company,. Atkins Global is a "World-leading design, engineering and project-management consultancy" and I applied for a work experience placement with them in hope of learning more about what engineering at Atkins entails.

Since Atkins is situated in Belfast, Monday June 9th started off with unnecessary worry as I feared the thought of getting lost and being late on the first day. However, Atkins in Belfast is conveniently stationed right in front of the Europa Bus Centre, and to the right of Starbucks. Inside a building called, "The Vantage", situated on the 5th floor is where the Atkins office can be found. For the first day, I was in fact early and I had the opportunity to get to know the receptionist. While waiting for the other work experience students to arrive, she gave me a general overview of what she does as a receptionist at Atkins and this helped calm a few nerves. When the other work experience students arrived, I was pleasantly surprised to see a few familiar faces. With all of us now present, we were led to a cosy, little, modern meeting room and this is where we mostly stayed for the entirety of our placement: from 9:30am to 3pm, Monday to Friday, that meeting room was ours.

Monday morning consisted of a tour of the building and the rest of the week consisted of multiple sessions that included talks, site visits, and group activities. I will be highlighting what I thought were the most memorable and invaluable sessions.

On Monday we had the "What is Civil Engineering?" talk by Aoife Campbell, who was also the woman responsible for organising our placements, as well as looking after us during our stay. This was followed up by two more talks from other employees at Atkins. After lunch, we talked about CVs and their importance and we then had to fill in a simple form that mimicked a CV. With their assistance, we wrote down our school subjects, our interests, hobbies, achievements, skills, and qualities and we had to explain how those would contribute to our future choice of career. This activity encouraged us to think and ask questions. Fun fact, Maeve Glover a Senior Consultant at Atkins states that, "Gaming is something you can put down as a hobby or interest, because it displays your team working skills, as well as your communication skills" which I thought was interesting. Again, after that talk, we had another two talks to finish the day. My first impressions of Atkins were a mix of relief that the first day was over, mingled with excitement for what would come the following day.

Tuesday was an eventful day. We had a talk on Electrical Engineering by Declan McLaughlin and he informed us of his work in the Water and Wastewater Industry. He's currently part of a £123 million project; the project is the upgrade works on Beckton STW. He's the only electrical engineer at Atkins, so he works with other people from a variety of other locations and because of Atkins' flexibility, he often just works at home on days he can't come into the office. It's not just Atkins that lack electrical engineers, many other companies are struggling to get electrical engineers because of the increasing demand for them. Statistics say that electrical engineers will be in high demand for the next decade. So, for those of you working to become an electrical engineer, keep at it!

We also had an Ecology talk by a very enthusiastic Atkins employee, Annoushka Bayat, who in fact didn't think she would end up with a career in Ecology. The reason for this was that she didn't get the grades she needed for a different course she was planning to do and ended up studying ecology instead. From there, she absolutely fell in love with it. Following that we had a Landscape Architect, Naomh Turbett, talk and give us a tour around Belfast. She showed the variety of projects she worked on in the city and not all of them went according to plan. For example, the metal spikes that you see lined up across the side of the road in front of Belfast City Hall labelled, Titanic, Olympic, Oceanic, Britannic, Laurentic, Celtic, Nomadic and Traffic. Those were originally supposed to oxidise into the same green colour as the roofs of Belfast City Hall. However, that did not happen due to the company responsible for the preparation of the materials messing up. After that we ended that with a new skill, since we spent the 2 hours learning the basics of AutoCAD, by making simple shapes using commands.

Wednesday was the exciting site visit day. However, that was set to be after lunch. So, before lunch we had a "Bridge Engineering Presentation" by Eoghan McManus, followed by a group activity. With the group activity, we basically got to play with magnets. After being split into two groups, my group was challenged with the task of working together and making a structurally sound bridge; using the knowledge we had learnt from the previous talk on bridges, and by following the instructions. Once we finished the bridge, we shook the surface the bridge was stationed on, to test its structural strength. Safe to say it survived the horrendous, 3.0 magnitude earthquake we brought upon it. What came next, was the talk on Geotechnical Engineering by Shane Gribbin, followed by lunch, then the site visit. For the site visit we needed steel capped boots, helmets, and high vis vests, since we were visiting a construction site to learn about the "Belfast Flood Alleviation Scheme". Lesley Cooper, an apprentice working for Lagan Construction Group (a company working alongside Atkins for this project) gave us some details about

Work Experience at Atkins Global

what they were doing and why. As you may or may not know, Belfast suffered a flooding back in 2008 and Belfast is predicted to experience another flood, so to combat this, this scheme basically allows the construction of walls around The River Lagan to prevent the flood from seriously damaging and ruining the surrounding area.

Thursday was a busy day with 9 different talks. The first talk of the day was "Building Surveying" by Conall McMurray. What followed was not a talk, but another activity. Monica McNally, another employee at Atkins, was supposed to teach us the basics of Civil 3D, however there was a problem with getting them loaded on our computers, so instead of designing a junction on Civil 3D we designed one on AutoCAD and we were able to learn a few more AutoCAD skills. Next was a Social Value talk by Brendan Gallagher, where he explained the planning and reasoning behind the design and location of the new Belfast bus station (that's currently in the works). The location of the new bus station is right behind the Europa, so on your way to and from the new bus station people are going to be encouraged to interact with the very accessible shops granted to them, since Great Victoria Street is lined with a variety of stores and businesses. The busy morning was followed by an even busier afternoon. After lunch, we had 3 separate talks for engineering: Aerospace, Tunnel, and Nuclear. To end the day, we were supposed to have informative talks on "Apprenticeships" by Omae Al Haj Kadour, "Placements" by Luke Gallagher and "Graduate Schemes" by Anisa McConnell, each talk scheduled to be a maximum of 10 minutes long. However, Omar, the employee giving the apprenticeship talk, started getting really passionate about his talk and ended up talking for the whole 30 minutes. Regardless, getting to hear about apprenticeships, especially from an apprentice, was really worthwhile and informative.

Before I knew it, Friday had arrived and the schedule for that day was pretty laid back and calm. The first session was a talk about "Process Engineering" by Laura Lyttle, followed by another AutoCAD lesson. This time we learnt how to make a roundabout with the road markings, which you'd think would be easy since it's just a circle with lines, however this task took us two hours. Then to end the day, and what was ultimately the end of my work experience placement, we had a 2 hour talk on "Drainage Engineering" by Ashleigh Leigh. When that last day came to an end, I left feeling more confident and even more sure about my plans for the future.

I found my time at Atkins Global very beneficial and I enjoyed the variety of experiences and knowledge I gained during my time there. You must acknowledge that not all companies you decide to do work experience with will work the same way as how another company may do it. However, I highly suggest taking up work experience whenever you can. If you're interested in engineering, but unsure of the type of engineering you want to get into, Atkins Global is the perfect place to do work experience, as they talk about a VARIETY of other types of engineering and the opportunities open to those.

Engineering Society

The year 2022\23 has been a great year for our engineering society with many new members. This year the E.S. was led by President Adam Wightman along with Vice President Kian Moran and Communications Officer Johnathan Leathem.

The Engineering society has had some very exciting guests, who work in the engineering industry in the past year such as:
Philip Murray from Collins Aerospace Brian Niblock, from ENE Group Mr Andrew Hull, a chartered civil engineer, Matthew Black from Alternative Heat
Meeting and talking to engineers with real experience has given all members a great insight into what a career in the engineering industry is like, not to mention the network our members have gained which has helped many of them receive work experience and internship opportunities.

Scholars and Professors have also come to share information with us, such as:
Dr Stephen Glover and Dr Beatrice Smyth from the School of Mechanical and Aerospace Engineering from QUB Mr Jim McLaughlin from UU school of Engineering

Getting to talk with these professional has given all members a great knowledge of the path to industry and what University entails and what admissions are looking for.

In conclusion, the engineering society is a great resource for its members, who are all ambitious future engineers. Any pupil interested in a career in engineering are more than welcome to join.

Engineering Experience

On 25th July 2023, a small number of Year 10 students from Banbridge Academy attended the 3 day Engineering Experience Summer Residential at Queen's University Belfast organised by The Smallpiece Trust.

This 3 day programme offered students the opportunity to get hands-on experience with STEM projects focusing on space, cyber and electrical engineering. 50 students from schools all over Northern Ireland participated in the programme and students stayed in the halls of residence throughout the course.

On day one, we were arranged in groups and were provided with a number of activities based on cyber engineering. Firstly, we had to decode a secret message based on levels of difficulty. Then we moved onto more complicated and advanced coding. After we had completed all the challenges, we then got a package that had radio equipment inside but was locked. We had to unlock the bag using all the different techniques we had completed earlier in the session. After unlocking the radio, we were provided with lunch, which we ate in our groups and spent time getting to know the other students. Later that day each group was given a lego robot. We had to code it to move in different directions, move and stop at different colours and manoeuvre around different obstacles. The staff had arranged a programme of activities that evening for us to engage in, and we had dinner and had planned to do sports outside, however the weather had affected these plans so we watched a movie and played some games instead.

On day two we engaged in some tasks based around electrical engineering. Each group had to design and create a radio, using the parts we unlocked the previous day and we had to 'buy' certain materials to create the outside of the radio to make it look attractive. We had to make the radio affordable enough so that people would want to buy it, this meant that we shouldn't spend too much so that people would buy your product. Firstly, we were required to solder all the parts of our radio onto the circuit board in order to connect them together. Then we needed to measure and cut out the pieces to make the shape of our design and hot glue it all together. After lunch, each group was given an ipad to create an advertisement for our radio. The radio and the advertisement would be presented in a showcase the following day. That evening we had dinner, and due to typical Northern Irish summer weather we didn't get to do sports outside, but spent the evening playing some more games.

At the beginning of day three we had to make sure the radios and advertisements were complete and the final touches were done. Before the showcase began, a member of the Thales Group came in and talked to us about engineering and the different job opportunities we could explore. Then each group displayed their radio and advertisement as some members of each group walked around seeing all of the different radios we had designed.. Once everybody had seen each radio, we each voted for the best team. The team who had designed the best product were given a prize of a mini bluetooth speaker, and this meant the end of our Engineering experience.

This was a really worthwhile experience as we were able to find out about lots of different careers in engineering as well as getting hands-on experience with lots of different equipment. It was also nice to spend time getting to know pupils from other schools. Overall, a really enjoyable experience.