

Science Department

W5 trip

On Friday 17th June 2022 Year Nine went on a Science trip to W5 in Belfast. We departed at the beginning of the school day and spent the entire day there. When we arrived, we were split into groups based on our form classes and we then dispersed to different sections.

The group I was in was given about forty-five minutes to independently explore floor four; there were four exhibits on this floor one of which being "Making sense" which explored light and sound and was packed full of optical illusions, visual tricks and multisensory experiences that were designed to push your senses and your mind to the limit. The other sections were "Explore" which was a very hands-on experience – it concentrated on what can be built and balanced; this section also contained glass panelling so that you could look down onto Belfast. "The studio" was aimed at displaying all things digital! There was a wide range of activities including the chance to design a character and to create a short stop motion video. The last section, "In our nature" was mainly focused around the four seasons and the changes that come with them, the water cycle and how our actions impact the world around us.

After this, we all went to a workshop. The workshop began by looking at roller coasters and learning about which ones were the fastest, longest, quickest and oldest. We were then given the chance of designing our own! Equipped with plastic railings and in groups with the people at our tables, we set out to safely transport a marble along our design and get points for danger, time and design. In some cases, our patience was tested to the limit as the plastic railings wouldn't cooperate.

After all our designing it was definitely time for lunch; we were given about half an hour to eat and the opportunity to grab something sweet from the shop.

As soon as lunch was finished, we headed to the second floor for some more exhibits; here we found a display named "The marvellous machine" which was actually multiple amazing machines instead of just one! Very soon there were cogs turning and things flying into the air. One of the machines was something similar to tug of war and that was definitely a favourite with the group I was in; suddenly everyone was lining up to show their strength (or lack of). "Move it" was the next section; its main attraction was an area where you could build your own model car and test it on a racetrack. The last section on this floor was "energise" which sadly very few people had time to explore, but it was focused on electricity and renewable power sources.

The last activity of the day was a climbing tower called "climbit", it was a selection of ovals positioned at different angles with the aim being to climb to the top and then back down, it was a bit of a struggle in some places

due to some people's height, but everyone made it back down safely.

We then departed on buses back to school, happy and exhausted from an amazing day out. I believe that everyone made memories that will last a lifetime! Thank you to all the amazing staff at W5 for creating such a welcoming atmosphere and for being very helpful.





Science Department

Science Outreach Day

Year 14 pupils reflect on their experiences assisting with the science outreach day with Primary 6



It was my privilege to help and guide a group of P6s on their visit to Banbridge Academy. On their visit to a chemistry classroom they were able to perform a number of experiments, such as applying different indicators to various acids and bases, doing flame tests with sodium, copper, and lithium ions and even making their own sparklers. I was amused to see their awe at the flame tests - something that I had to painstakingly memorise prior to exams. Overall, I am sure a fun day was had by the children and I have no doubt some of them will return to Banbridge Academy to study chemistry in the future.

- Jacob Porter

The younger students had a blast in the physics department as they experimented with static charge. Their first challenge was to make paper stick to balloons and move small strips of plastic bags just by holding their hands nearby. Following that they attempted to direct rulers and bubbles using static charge that they generated themselves with their ties. Their final challenge was to race cans down the table in a head to head battle, using a static charged ruler to move them. They also got to see a Van der Graaf generator in action.

-Josh Glover

I really enjoyed taking younger pupils around the Academy for our first ever Science Outreach Day! I especially liked the biology station, where pupils worked against the clock to solve the escape room challenge and discover the treasure that awaited them. We started with a video outlining the history behind local hero Captain Francis Crozier and the mysterious circumstances around his death. The children took part in a series of tasks including code breaking, science problems and piecing together a puzzle. While we were unable to locate Captain Crozier's remains, their efforts were rewarded with a sweet sticky treat!

- Kiera McQuaid



Science Department

A Question of Taste: DNA Workshop

In the Spring term the Biology teaching staff organised a trip to W5 to give our Year 13 pupils some practical experience of experimental work with DNA. The Year 14 Biology syllabus has a large topic on gene technology, so we saw this as a great opportunity to get a trip out of school, learn some interesting Biology and carry out practical work that cannot be completed in school.

With such large pupil numbers in Biology at A-level, the trip had to run over 3 days so all pupils had the opportunity to attend. Mrs Tully and Miss Anderson accompanied the pupils on the first day and both were very impressed with the organisation and delivery of the workshop and the high standards of behaviour and engagement from our pupils. The workshop was based on the theme: 'A Question of Taste'. The pupils were asked to take a simple taste test to begin the session. Paper strips impregnated with a chemical called Phenylthiocarbamide (or PTC for short), were given out. Whether or not one can taste the chemical is down to genetics. Some of us are born 'Tasters'



(if we have inherited a dominant copy of the TAS2R38 gene for tasting from one or both our parents), whilst others are born 'Non-Tasters' (if we have inherited two recessive copies of the gene). PTC is a chemical found in brussel sprouts, so 'Tasters' generally dislike sprouts as the chemical has a bitter taste.

The pupils then extracted their own DNA from their cheek cells and carried out a PCR (Polymerase Chain Reaction) procedure to make many (23 billion to be precise!) copies of their own TAS2R38 gene.

After lunch a procedure known as a 'Restriction Digest' was completed. This involved chopping up their amplified DNA sample with a special enzyme called a restriction enzyme, which makes targeted cuts in DNA at the TAS2R38 gene. Individuals who

have inherited two dominant copies of the gene from their parents will have 2 fragments of DNA produced as a result of the restriction digest; individuals who have inherited one dominant and one recessive copy of the gene will have 3 fragments of DNA produced and those who have inherited two recessive copies of the gene, will have 1 fragment of DNA produced.

In the final stage of the experiment, the pupils used a technique called 'Gel Electrophoresis' to separate their fragments of DNA. Using an electric current and radioactive labelling, it is possible to separate and visualise fragments of DNA based on their size, thus producing a Genetic Fingerprint. The pupils could then use the results of the electrophoresis to determine their own genotype for the TAS2R38 gene and if it matched their ability/inability to taste the PTC chemical.

