In the thirteenth edition of the Science, Technology, Engineering and Mathematics (STEM) newsletter, we will look at the interesting and exciting activities that students have been involved in.

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On Wednesday 23 November, 15 Technology students visited Make UK, Birmingham Engineering hub to take part in a STEM team building exercise. The students worked in small groups to create a moving crane model using cardboard and other resistant materials.

Students also had the opportunity to take part in a tour of the factory and were able to view the F1 race track, which they were very interested in. They then had a look at various types of robots that were on display and had tours of workshop machinery that are used on a regular basis.

Finally, the students were given the opportunity to speak to the current apprentices and ask them about career paths, routes into engineering and what a regular day would look like for them.
F1 in Schools

This term in Technology, the F1 school teams continued to design, build and test their F1 vehicles in preparation for the STEM F1 in Schools regional finals. Over the past three months, the students have designed and manufactured a mini F1 race car using a range of processes and techniques including using CAD software such as Solidworks and Fusion 360 to design and then used CNC machinery to cut out their final body.

Both Walsall Academy teams performed excellently on the day and were put through a number of judging assessments and tests including a verbal presentation, a portfolio check, a vehicle scrutiny check and testing their vehicle by racing it on the track.

The Bloxwich Racers won the fastest reaction time award and Team Turbo won the best pit stop display award. Both groups displayed excellent team work and were commended by the judges for their professionalism.
RAF Mighty Minds Competition

In January, 30 Year 7 students and 30 Year 8 students took part in the RAF Mighty Minds STEM competition, run by Antony Hyett from Hyett Education. Students were split into teams of three and taught the basics of computer programming and building robotic machines, using Lego Mind Storm kits. Students worked through a series of tasks and gained points for their team as they completed the increasingly difficult challenges.

After getting to grips with the programming and building aspects, students were then given the opportunity to test their creations on a series of themed routes which included a lunar expedition, a mountain terrain and a challenging race track.
RAF Mighty Minds Competition

The teams were then given the opportunity to tweak their designs and make any final changes or additions before being given the choice of completing one of three rescue operations. The first involved students rescuing civilians (Lego statues) from flooded buildings to a safety area; the second focussed on moving aid supplies to a cargo container and the third and most challenging involved the teams building a rescue vehicle that could carry three astronauts to safety.

All of the students worked really well and the team from Hyett Education were very impressed by their resilience, behaviour and professionalism. The winning team will now take part in the regional finals that will be held at RAF Cosford in April!

Well done to all of the students who took part, you were a credit to the school.
Spectroscopy in a Suitcase

In February, Dr Mark Read from the University of Birmingham came in to run a Spectroscopy in a Suitcase Workshop with the Year 12 Chemistry students.

The students had the opportunity to put their learning in analytical chemistry into practice by using an infrared spectrometer and mass spectroscopy data to identify different unknown compounds.

Dr Read also gave students a taster of what degree level chemistry is like by extending their learning and giving them more challenging questions that touched on content that is outside of the A level specification.

Students did really well and by the end of the session, they had correctly identified all of the unknown compounds.
Spectroscopy in a Suitcase

The groups also had the opportunity to run different types of samples through the infrared spectrometer and analyse the results given.

Throughout the session, students were also given information on the real life applications of the analytical techniques, university life, university courses available with chemistry and possible future careers.

All of the students had the opportunity to use the equipment and run their own spectra, which they all enjoyed doing.
**STEM Club**

This term in STEM Club, the students have been preparing for not one but two STEM competitions! The first is the Shell Bright Ideas Challenge in which the students are hoping that their idea of a wind turbine powered train will be a winning idea to help with meeting energy demands in a city in 2050.

The second competition is the Express and Star STEM Challenge in which the students have got to design a product that focuses on improving mental health and wellbeing. For this challenge, the team have been paired up with a STEM mentor from South Staffs Water who is helping to advise and guide the students in their early stages.

Both competitions are challenging and the STEM Club team are working extremely hard to meet all deadlines and design and make great products that will hopefully see them enter Regional Finals.

Best of luck in both competitions!
Dyson Visit

On Tuesday 5 November, a member of the James Dyson institute came into the Academy to work with a small group of Year 13 students. The students were introduced to the design of the Dyson 360 Heurist robot vacuum. This robot vacuum was designed to work in a spiral pattern for the most efficient way of cleaning.

Students worked in pairs to use their engineering, electronic and problem solving skills to program a small robot using Lego Mind Storms to navigate around a set up room avoiding the obstacles along the way.

All of the students worked well in pairs to work like engineers to problem solve and re-programme ensuring the success of the robot. The Dyson team were really impressed by the maturity of the students and their professional way of working together as a team.