

Welcome to Pupil Power

Lots and Lots of 'Bots

Dancing robots, an RAF flight simulator and a remote handling arm challenge kept both primary and secondary school students busy during the recent robotic challenge days at Sellafield.

Co-ordinated by Cumbria STEM centre the event was also supported by BNS Nuclear Services, Genesis promotions and Aim Higher.

Whilst STEM ambassadors worked with teams of pupils to design, build and programme their own dancing robot staff from BNS guided the students through the remote handling challenge – not as easy as it looked!

Once the helpers had been ejected from doing test flights the pupils eagerly queued up to become pilots in the making.

Oscar the robot was again on hand to chat to pupils (and lots of visitors) before compering the dance-off between the uniquely designed and programmed robots. Prizes for the various categories were donated by the organisations involved. Pauline Farrell said " We have been running the robotic days for a number of years now and by working closely with the above mentioned partners we have delivered a unique format for teaching basic robotic principles. More of the same will be planned throughout the new school year"



Welcome to a bumper edition of Pupil Power – issues 6 & 7 combined. Thanks to all of you who have joined us in the many events and activities mentioned. Please continue to keep in touch with us to discuss your own ideas and requests for support, we very much welcome the opportunity to work with you to achieve the best for your students.

Whilst you have been away for the summer the Education Team have undergone a major change with the closure of our Yottenfews Environmental facility. I appreciate just how much of a loss this will be to many of you who have visited year after year and have enjoyed working with our experts Millie, Liz, Corrin and Louise.

They have provided a unique learning experience delivered with dedicated professionalism day after day. As the majority of them move onto bigger and better things I'd like to say a personal thanks for all the support and encouragement they have given to me – I'll miss you loads. Good luck to you all.



Lucky (?) Corrin will now be working with me on delivering a planned programme of events, welcome to my world Corrin.



Pauline

Jobs in our Community

Connexions Cumbria organised their annual careers awareness day aimed at Year 6 students inviting local industries, public service providers and education establishments along to highlight a variety of opportunities to the pupils. Over the two days more than 860 pupils tried their hands at decorating, engineering, childcare, hairdressing and a whole host of other activities. Sellafield Ltd ambassadors Pauline Farrell, Cheryl Ireland and Sean Kerr were on hand to talk about science while students tested a variety of household solutions to determine PH levels.



All visitors had a workbook to complete which encouraged them to chat to the providers to answer questions on qualifications and the world of work. The Jobs In Our Community event has gone from strength to strength since it was first held, winning a national careers award in 2008.

Sellafield Science and Engineering week

UCLAN Science Day

Responding to a request from the West Lakes Academy who were working with the UCLAN facility at West Lakes Science park a group of ambassadors from Sellafield Ltd & NNL worked with the team to develop a fun-filled, interactive science day recently.

Year 7 pupils from the academy spent the day with year 6 students from St Bees village school with a view to easing the transition from primary to secondary school. School groups were guided & assisted by 6th formers from the academy.

A number of external providers delivered lectures on the science of super heroes, the science of soil and also guided pupils through an interactive ICT session.

RSC members, students and SEAS from industry set up a whole host of experiments and activities including – making goo, flubber and slime, balloon kebabs, invisible ink and many more.

Soapy science was also taking place with pupils using newspaper to blow bubbles, making a cubic bubble and standing inside a human sized bubble.

Mr Terry from the academy, with his lovely assistants held the attention of his groups by carrying out some 'really cool' experiments using liquid nitrogen. Crushing carnations, condensing balloons and using a banana to hammer nails in made sure the students were entertained from start to finish.

Giving up his lunch break Dr Mike Edmondson, NNL created volcanoes by dropping mentos into coke and also set up a demonstration of a putt putt boat as well as launching rockets using a pump and empty pop bottles.



A brilliant time

Comments ranging from "that was the best day of my life", "I never wanted to go back to school" & "it was an amazing day and an unforgettable experience" proved that once again Jonathan Barton from the Children Challenging Industry (CCI) project had our young visitors engaged from the minute they arrived at the Sellafield Centre.

Over two and a half days the students worked with Jonathan and a number of Stem ambassadors on a series of industry related experiments. These included testing the filtration properties of various materials, using robotic arms in a mock-up glove box and designing a test to decide on the most effective toothpaste brand.

In addition to the above they also created a mini heat exchanger from an empty pop bottle and some plastic tubing, tested the viscosity of various liquids and made a water level sensor from a cork, tube, beaker and a basic electrical circuit.

Plenty of fun was had making their own toothpaste, whilst dressing the teachers in site PPE and photographing the evidence was also very popular.

Prior to the experiment sessions Jonathan had already visited schools to do some preparation work with the students and teachers had previously been on a site visit as part of a teaching training session also held at the centre.

Plans are already underway to schedule the next CCI sessions during the new school year.



Pedal Power

In keeping with tradition St Benedicts ran their annual Junior Young Engineers go-karting competition on the 6th July at Rowrah go-karting track.

Throughout the 6 months leading up to this STEM ambassadors from industry have been working with pupils from St Beghs, St Joseph's, St Bridget's and St Mary's on a project to design and build a pedal-powered kart. Pupils have also spent time working with St Benedicts staff whilst visiting their workshops to machine the bodies.



On the day teams were judged on a number of criteria including best kart, best brake light system, best folder and on the race results.

Judges were provided from local industry and commentary throughout the race was provided by Ryan, a St Benedicts student.

Luckily the rain held off for the actual race in the afternoon during which competitors not only had to emulate Lewis Hamilton but also pull in for pit stops to change the braking light system and also carry out a wheel change.

Marks were swiftly totted up whilst the crowd grew more and more vocal until eventually St Josephs were announced as overall winners to scenes of intense excitement from team members, classmates and engineers!

Each participating pupil received a medal and a goody bag filled with items donated by local industries, with trophies also being awarded.

Additional entertainment was provided by the engineers race – sponsored by 'knobbly knees 'r' us'.

Pauline Farrell said " Sellafield Ltd have supported this event since the very first year and we were more than happy to provide sponsorship and judges again this year. Mandy Pattinson and the team from St Benedicts certainly have a winning formula on their hands - a great day out but more importantly a really fun way to learn about engineering"

Engineering Challenge

Making and launching paper aeroplanes, using a CD, cotton reel and a balloon to make a hovercraft and launching ping pong balls via a launch pad were some of the activities on offer during a recent engineering day held at Sellafield.

STEM ambassadors from Sellafield Ltd, GEN 11, Atkins and Allerdale Borough Council worked with KS2 pupils from St Gregorys, Orgill, Montreal, Beckstone and Frizington primary schools to ensure they tackled all activities throughout their stay.

In addition to the above challenges pupils also built and raced jitterbugs and created structures using KNEX material.

Pauline Farrell said " Our engineering days are always fully subscribed with pupils and teachers enjoying the range of learning activities on offer. I'd like to thank Cumbria Stemcentre for organising the event and to all ambassadors who helped on the day"

INPUT Technology Days

Showing off their creative side pupils from Thornhill primary and St Patricks, Cleator Moor readily accepted the challenge to build a bridge structure from rolled up sheets of paper, masking tape and nuts & bolts.

Under the expert guidance of Bryan, Eunice and Mike from INPUT (Industry North Project: Understanding Technology) the students were given guidance on how to roll the paper using a split dowel to make the strongest possible structure.

Each group were encouraged to work as a team, allocating tasks to all members. Lots of lively debate followed before team names were decided and designs for the bridges agreed upon.

Tension mounted as one by one the teams were called up to the stage to test the strength of their bridges.

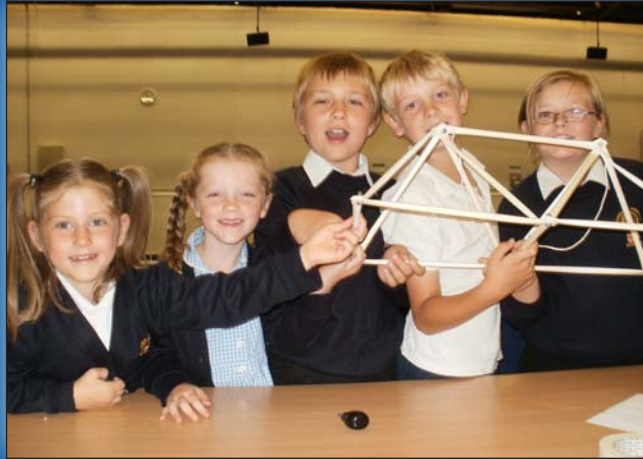
The minimum target was for the bridge to hold a weight of 2 1/2kg, easily achieved by all the teams with many of them holding the maximum weight of 8 1/2 kg.

Both schools thoroughly enjoyed the technology sessions with pupils taking some rolled up tubes back to school to demonstrate to classmates.

Following on from the Primary school session local 6th form students were invited along to the Sellafield centre where they were given a small kit of equipment including batteries, tape, lolly sticks, gears and pulleys.

Using the materials provided the teams, guided by ambassadors from Sellafield & NNL, had to construct a vehicle designed to travel along a suspended aerial line, starting from a designated point at one end of the line, once it reached the mid-span position the vehicle had to automatically release

a marker buoy equipped with a flashing light into the paddling pool below and then continue along the line to the end point. The water buoy had to self-righting so the beacon remained above the water and also be capable of automatically initiating its flashing capability in that position.



Students spent time discussing the pros and cons of various designs before building began. After practice tests alterations and modifications took place until it was time for the final run.

Supporting each other the teams launched their vehicles one by one, some proving to be more successful than others.

The task proved to be very complex and time consuming but was enjoyed by all who took part and observed (even Mrs Mop a.k.a me!)

INPUT was launched as a project for Industry Year as far back as 1986 with the aim of making young people more aware of the challenges within engineering and the career opportunities available within the industry.

Working in partnership with industry INPUT has developed into a new approach to learning, presenting engineering to young people through challenging, open-ended project work requiring the application of mathematics, science and technology.

Commenting on the two days Pauline Farrell said "It was amazing to see the students of all ages, from Year 1 through to Year 12 embracing the challenges set to them using basic items of kit to design, build and successfully complete the tasks. The two days were a great success and I look forward to working with the talented INPUT team in the future".

Here come the girls

Over 100 year 10 female students from St Benedicts, Netherhall, West Lakes Academy, Stainburn & Keswick schools visited Sellafield recently to carry out a number of activities during a Girls In Engineering day.

Activities, which were led by STEM ambassadors from Sellafield Ltd & NNL, included building weight-bearing KNEX structures, launching paper aeroplanes, making rockets and hovercrafts and firing ping pong balls from a launcher. The girls only event organised by Cumbria STEM centre was as popular as ever with the students who welcomed the opportunity to work closely with ambassadors to learn first hand about job roles and career opportunities.



National Science and Engineering Week – March 2010-08-27

During NSEW a varied programme of events was delivered in several locations enabling over 970 students to experience all things scientific. The visiting Stardome – a huge inflatable planetarium, amazed all those lucky enough to be invited along to travel across the universe. Over 4 days Martin Lunn MBE packed in budding astronomers who were fascinated during the journey through the myths and legends around the galaxy. Using a fresh egg and barely enough protective material to make a difference secondary schools students had to design a body suit to protect the egg when dropped from height. Following on from a fascinating presentation delivered by Dr Diane Aston, Education Manager, IOM3 they were asked to think about the properties of the material provided and how they could achieve the best result.

Rounding off the week the Sellafield centre was invaded by teams of forensic science experts drafted in to solve a murder most horrid.

Working in teams they were assigned a crime scene to investigate, bagging and recording evidence which included love notes, wine bottles, fingerprints and blood samples.

Back in the lab they worked on looking at blood spatter patterns, the maggots on the bodies and footprints to determine height etc before eventually disproving the suspects innocent plea.

STEM ambassadors also spent the day at a hands-on science event at Barrow dock museum whilst others judged the annual Rotary Club Technology Tournament.

At the end of the week Pauline Farrell said “ Year after year our input into the NSEW programme of events continues to improve and expand and this year has been the busiest yet. So many of our ambassadors and external providers have worked very hard to ensure it all ran smoothly and we are looking forward to doing it all again next year”



Water rocket challenge

After liaising with the National Physics Laboratory Dr Dominic Rhodes, NNL came up with the idea of holding the very 1st International West Cumbrian Water Rocket challenge.

The event which was jointly organised and funded by NNL and Sellafield Ltd took place at St Benedicts school and involved their pupils together with those from Cockermouth, Keswick and Stainburn schools.

The pupils formed mixed teams before receiving a kit of equipment consisting of an empty fizzy drinks bottle, a tennis ball, a roll of tape, a fin template and some corraflute. During the introduction teams were asked to think about the design of their rocket to achieve reduction of air resistance whilst maintaining stability.

Once construction was complete the finished rockets were taken outside to the launch area.

After a safety brief on launch procedure students were asked to decide how much water they wanted to add to their rocket, this was carefully measured and recorded.

The rockets were then attached to the launchers with the angle also being measured and recorded, the all important decision on how much pressure to apply was then considered.

After counting down each rocket was launched and once all had landed safely measurements were taken on how far they had travelled and how close to the target they landed.

Teams then re-grouped to make any necessary repairs and to re-think their decision on water volume, rocket angle and pressure applied.

Several more launches took place during which the students and particularly the teachers really got into the spirit of things and competitiveness was the order of the day. Each team worked with ambassadors from NNL & Sellafield Ltd.

All participating students received promotional items whilst team prizes were awarded for the following categories – overall winner, most entertaining flight, nearest to the target and furthest flight.

And the end of a great day Dominic Rhodes said “ The local community has undergone challenging times recently so the competition was designed as a fun way to bring schools together before the end of term. Students got to grips with the challenge understanding the theoretical physics behind the practical application”

No low-flying seagulls were harmed during this event





Fun at the fair

Sellafield Ltd was a Major Sponsor of the The Big Bang; UK Young Scientists' and Engineers' fair, which took place from 11th-13th March, at the Manchester Central Convention Complex and which kicked off National Science and Engineering week.

More than just a great day out, the Big Bang 2010 was a sensational educational experience for 22,500 children, teachers and parents from across the UK. It showcased the many and varied exciting science and engineering careers on offer.

Featuring the National Science and Engineering competition, the fair aimed to celebrate the achievement and excellence of young people, while educating, enthusing and inspiring them into studying STEM (science, technology, engineering, mathematics) subjects and highlighting future career options.

Vicky Harold, a project management graduate, led a team of 15 multi-discipline graduates from both Risley and Sellafield with support from Paul Adams, Ian Belger and Pauline Deans to put together an interactive display area and workshop for the event.

Vicky said: "Our vision was to create a fun, lively, memorable experience for all visitors who passed through our exhibition stand. It was our mission that each visitor left with a desire to discover more about the nuclear industry as well as science and engineering in general".

Ian Belger said: "The graduates formed a strong dynamic team and ran the 'Big Bang' project from start to finish. The team defined the 'vision' for the Sellafield stand and carried out all of the work to make the stand come to fruition. The end result was fabulous – arguably the best stand at the show".

The interactive area consisted of a 'mock barrier' for visitors to pass over and to try on PVC suits, a hand-held remote control crane, a glovebox, 4 activities that when combined demonstrated the Nuclear Fuel cycle and a remote handler activity to name a few.

Jane Kirk, Head of Science at Sir Thomas Boteler Church of England High School said: "Our pupils had a brilliant time at the Big Bang and were very impressed with the Sellafield Ltd stand and especially Oscar the Robot!"

Rotary Club Technology Tournament

The annual rotary club technology tournament held at The Lakes College Lillyhall on Friday 12th March was again sponsored by Sellafield Ltd.

Organised by the Workington branch of the Rotary club local secondary schools were invited to bring along teams of students to enter into the basic, intermediate & advanced levels of the competition. Accompanying teachers were also split into teams and competed against their students. This years task was to design and build a flashing beacon with varying degrees of difficulty according to the category.

Using a provided kit of equipment which included card, wire, straws, kitchen foil, bulbs & batteries the teams were allowed planning & design time before getting busy.

The basic design had to incorporate a flashing light on top of the structure, the intermediate beacon had to flash a minimum of ten times providing a method of connection to the test power base and the advanced teams also had to make sure the timing between flashes was a frequency of 1 second.

Guided by chief judge Dr Rob Bernard, Senior Operations and Technical Support Advisor Sellafield, the judging team which comprised both Sellafield and Rotary club members awarded marks against several criteria including evidence of planning, design proposals & development work, team work and their portfolio. Team 1 Cockermouth school won the basic category, 2nd were Keswick school followed by team 2 from Cockermouth claiming 3rd prize.

In the intermediate category Keswick won with St Benedicts runners up and in the advanced category St Benedicts scooped first, Cockermouth 2nd and Keswick 3rd. Also participating were a team of community police officers who pipped the teachers teams by one point to claim victory.

After the event Rob Bernard said "It was great to see everyone getting involved and coming up with successful demonstrations"

BNFL Legacy Projects

The recent donations allocated to all our schools under the above scheme continue to be put to good use with some really innovative and inventive ideas. I have been very lucky to have been invited along to some of those that are already completed and have been amazed at how much thought has gone into making the money work long-term to the best advantage for all pupils.

I was made to feel very welcome at the Victoria Infant school Gala day held in July where the BNFL sensory garden was unveiled. Each pupil had contributed to the design and content of a fabulous space packed with many interesting ideas and learning areas which has the potential to keep on improving. The students entertained all visitors with fabulous dancing displays, music from a neighbouring school steel band and plenty of stalls and activities.

St James Junior school in Whitehaven also chose to use their money on developing an unused area into a sensory garden which has been planted by the students themselves. They also have a greenhouse set up and were showing signs of producing a bumper crop. Musical instruments had also been purchased and set up and all this had been designed and delivered after the school council consulted with all pupils before presenting suggestions to staff. Former Sellafield Ltd worker 'Grandad Cyril' McManus, now a school governor was rightly proud of their achievements.

Allonby primary school purchased scientific equipment which they used during their recent science day. Pupils were carrying out many investigations – some assisted by Killa Jules – the mad scientist who had the pupils making slime and discussing its properties.

The staff at Ewanrigg Junior school appeared to have bought out enough stocks of educational scientific equipment to keep the pupils out of mischief for many years to come! Looking at the many scientific projects already carried out by the school it will certainly be put to good use.

Bookwell primary used the donation to fund an annual BNFL technology tournament for the next 25 years (I might just have learnt some science by then) purchasing materials needed to carry out the projects. This years theme was all around eggs – with each year group being set a different challenge/activity to investigate or complete. These ranged from designing the best packaging to protect eggs, building egg buggys which were then raced, designing egg parachutes and making clay egg cups. Every single student in the school was so eggscited and completely involved in their chosen task – it was a fantastic day which must have taken an awful lot of organising.

Please let me know when your projects are complete and we will visit and take some photos and write about your school.



Ambassador Profiles

Name: Sarah Beard

Occupation: Senior Technical Advisor at Sellafield Ltd

What were your interests when you were at school?

Science – I loved to know how it made the world work – especially chemistry.

As a student were you able to take advantage of any STEM type activities outside the usual school timetable?

No – I'd never heard of it before I started work as a graduate at Sellafield

If so, how did this influence your career path? N/A

What are your roles and responsibilities in your workplace now?

My day job involves helping any area of Sellafield Infrastructure (chemical analysis labs, water treatment plant, utilities, sewage treatment plant, transport, the list goes on) with technical issues – sometimes this means applying the chemistry I learnt in my degree, or managing improvement programmes.

However I also do lots of "extra things", like being a STEM ambassador. I'm even helping a local theatre put together a business plan at the moment.

Why did you decide to become a STEM ambassador?

I love to feel like I'm making a difference to people, so when I heard about the STEM scheme I knew it was perfect for me. Before me, nobody in my family had gone on to further education, but I went on from a state school education to university to gain a Masters in Chemistry. A lot of school students in Cumbria don't have the aspiration or don't think it's possible to go to university so I thought I could be a positive role model – especially being a proper girly girl but with a science degree and a technical career!

What do you feel are the positive outcomes of being a STEM Ambassador? For yourself?

Apart from getting the opportunity to develop new skills (more about that later), the biggest outcome I get from being a STEM ambassador is a great sense of joy out of the knowledge that I have helped someone, inspired them or even just got them thinking about the future a little! It is one of the most rewarding things I do.

For the pupils taking part in the activity?

On a technical level, the pupils get chance to learn what science and engineering mean in the real world and try some fun hands-on activities that spark their interest in the subjects. They also get a chance to see and speak to professionals who work in these areas – some very experienced that can pass on all sorts of knowledge, and some young people who are only a few years older than them and can connect with them and hopefully inspire and advise them.

For the teaching staff accompanying the pupils?

An opportunity to expand the learning of the pupils with activities and experience that would be otherwise be difficult in schools or on a smaller scale. This may build on the existing curriculum to aid learning back in the classroom, or open up completely new areas of experience. Teachers also form strong contacts with professionals in industry who can provide experience and support for the teachers and pupils.

Which STEM activity have you enjoyed the most and why?

I have been involved in a wide range of activities – from fun hand-on engineering days, to careers programmes and presentations about my career path so far. My favourite types of activity to be involved with are those that help pupils understand their opportunities and believe in their ability to follow them – so I really enjoyed being involved with the STAR Windmills pilot project at a local high school. This is a career inspiring and planning programme for secondary school students which encourages them to first think about what they are good at (Skills), what they love doing (Treasures), what they want out of life (Ambitions) and then to use a combination of these to identify Roles (not job titles) that would suit them. I wish I had the opportunity to plan my career in this way at that age!

What was your role in this activity?

My role was to assist the Windmills Champion in some of the group activities, where students could ask me about my Skills, Treasures, Ambitions and my current Role. I was also involved in the final day of the 6 week programme, where we met again with the students and they talked about their plan for the future. It was so rewarding to see pupils with very little ambition go to having a plan for the future in just 6 weeks. I can't wait to be involved further and train to be a Windmills Champion myself!

Do you think being a STEM Ambassador has enhanced your career in anyway?

Being a STEM Ambassador has given me the opportunity to develop skills that I don't normally get to practice in my day job, but they are highly transferable and very valuable to me in my career. These are things such as presentational skills, interacting with large groups of young people, inspiring others, organising events, the list goes on!

Do you have any advice for people who are considering becoming a STEM ambassador?

Don't hesitate – you have nothing to lose, but a HUGE amount to gain! If you can inspire or help just one young person then it is worth it! (And you will find that it helps an awful lot more than one person!)

