

## Welcome to Pupil Power

### Buzzers, bells and motors!

Over the last six months, over 300 pupils from local schools in West Cumbria have enjoyed a series of circuit workshops designed to introduce key stage 1 and 2 pupils into the topic of electricity.

Led by members of Sellafield's Education team, the workshops, which follow National Curriculum guidelines, last approximately two hours.

Working in small groups, students get to use high quality circuit sets to build their own electricity circuits as well as learning how to change the brightness of bulbs, using switches, buzzers and motors and testing conductors and insulators.

Speaking about the workshops, Millie Clarke said: "The circuit workshops have been a great success. The children really enjoy experimenting and making different circuits and the older children can try out series and parallel circuits

and are set challenges."

New for November (and running through to the end of February 2010) are the Forces workshops. Again following the National Curriculum guidelines, these sessions are designed to teach pupils about the forces of nature – gravity, friction, magnetism, water and air resistance. For more information on the forces workshops please contact a member of the Education Team on 01946 73366.



### Stainburn School gets 'physical'

A team of physicists (who are also Science and Engineering Ambassadors) from Sellafield Ltd and the National Nuclear Laboratory (NNL) have been spending time back in the classroom, providing support to the physics department at Stainburn School.

Due to the unusually large year 12 group, Chris McGrath, Head of Stainburn requested the assistance of the nuclear physicists, to provide support to the school's other physics teachers. As such, Gary Palmer, from Sellafield Ltd and Craig Shearer Senior Research Technologist, from NNL have organised a rota of volunteers to sit in on lessons to assist the teachers.

Speaking about the programme, Pauline Farrell said "Without the commitment and determination of Craig and Gary to push this forward, the programme of support would not have got off the ground. I'm extremely

grateful to them both for seeing this through and I know the school have welcomed the input from the Ambassadors.'

Since they began assisting the school, the group have worked with pupils covering subjects including reviewing the vector and resolving forces into horizontal and vertical components as well as dynamics equations for projectile motion.

Commenting on his time in the classroom Craig said "it was an exciting prospect to be able to go into a classroom and provide practical support in a subject which is close to my heart. The enthusiasm and ability of the group and teachers was inspiring and gave me a new perspective on the subject'

Craig and Gary will continue to work with the school to provide support to both students and teachers throughout this school year.

Welcome to the autumn edition of Pupil Power. I hope that you have had a wonderful summer. We have been out and about over the last few months taking part in Science and Engineering Week and racing go-karts in Rowrah – but more on that later.

We are looking forward to working with as many of you as possible in this school year and can't wait to catch up with everyone. Very best wishes for the coming school year,

*Pauline*



### Inside this issue

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## Back to School

In response to a request from Heather Crompton, science co-ordinator for Lorton School, a team of STEM ambassadors agreed to go back to school for a day to provide advice and support on all matters scientific.

Heather who had been working with staff and pupils to put on their very own science week, had called upon the STEM team to provide the pupils with a variety of experiments that would keep the pupils interested in the event throughout the day.

Choosing the one day where the sun was shining on the righteous, or at least Lorton, the team were able to set up their messiest experiments out of doors. This enabled the pupils to bash a cornflour mixture around in a roasting tin without redecorating the classroom, along with providing an excellent demonstration of the properties of liquids and solids.

A second experiment involved dropping mentos into coke bottles to produce a very impressive coke fountain and a first class demonstration of the effects of a release of a gas from within a liquid.

The pupils also learnt how heat was used to power a model steamboat around a paddling pool and had great fun in launching rockets into the clear blue sky using water and a

foot pump. The pupils were asked to consider if changing the volume of water would have any effect on the height achieved by the rockets. The results were most impressive.

While indoors the pupils were encouraged to test different bubble solutions, looked at the different densities using ketchup sachets and were entertained by the 'dancing raisins' that well known 'grape' group from all our yesterdays.

The final experiment area had the pupils building and launching paper aeroplanes, doing a spot of money laundering (cleaning pennies with sauce and vinegar), creating an unbreakable balloon, testing the 'brazil nut' effect with rubber ducks and rice krispies and sticking pencils into a bagful of water without spilling a drop!

Pauline Farrell said: "Every pupil in the school took part and a great day was had by all. We were made to feel very welcome and felt as though we really were part of the school. The pupils are a real credit to the school.

"Heather has worked really hard to put on a week-long series of events and activities, not just for the pupils but for the community as a whole, we were delighted to be included."

## The Magic of Science

Year five pupils from Monkway School, Whitehaven were challenged to a series of fun activities designed to illustrate the science behind forces and friction, density and viscosity, as part of Sellafield's science and engineering week activities.

Held at the Sellafield Centre, the pupils took part in a science obstacle course packed with activities based around the curriculum subjects.

The activities were led by Mike Driver, Science Education Consultant from Strawberryfield Ltd who set out 25 different, hands-on science experiments.

From solving the mystery of the spinning perpetual wheel, predicting what would happen to different sized candles when covered by a jar, and trying to catch a floating pig, the pupil's thinking and problem solving skills were put to the test.

Speaking about the activities, Pauline Farrell said: "The pupils were amazed and enthralled by the day's activities. Not surprisingly they flew through the obstacle course leaving them time to have a sneak preview of the scientific magic show that was being delivered later that day."

The magic then continued well into the afternoon as 60 excited year five and six pupils from Bookwell School arrived to take part in the magic show.

Mike's interactive magic show saw the group create different types of bubbles, squeeze hard boiled eggs into laboratory flasks, ignite specially treated paper and tie themselves in knots with

giant paper chains, all in the name of science!

Speaking about the afternoon's activities, Pauline added: "The pupils from Bookwell School were a great group who joined in all the activities - coming up with their own predictions and explanations. A thoroughly enjoyable day was had by all."



## Dragons Den



Millie the Millipede, Chavette the bearded dragon and a crateful of scorpions kicked off Sellafield Ltd's science and engineering week activities.

Pupils from Beckermeth and Orgill primary schools attended the event at Sellafield's Learning and Development centre which played host to a whole array of bugs and beasts, all looked after by Jacinta and Kev from the Silverband Falconry Company.

Throughout the hilarious mini beast and mammal handling sessions, the pupils covered many curriculum topics

including habitats, life cycles, predators and prey, endangered animals and much more.

The pupils also got to cuddle Brian the Giant African land snail, encouraged Tommy the Tortoise to run for it and watched Chavette the bearded dragon dine out on crickets and mealworms.

Pauline Farrell, education and community liaison officer, said: "Kev



did a great job of convincing the pupils he was a baby polar bear cub called Dottie, whilst showing off Felix the pole cat, a hedgehog that had been rescued from the innards of a combine harvester, and a Chinchilla that could out-skate Torvill and Dean any day.

"His party piece was to don a protective jacket and gloves before showing the group his family of Sugar Gliders, which promptly ran up his coat, along his arms and launched themselves into space before a perfect landing ensured they were back in the protective pouch on their cage, very impressive."

## Sellafield turns CSI!

**The Sellafield Centre was recently the focus of a massive forensic science investigation following the discovery of five 'dead bodies' in the exhibition area!**

Fortunately they weren't real bodies, but this didn't stop 30 year nine pupils from Cockermouth School from cordoning off the scene to begin solving the hideous crime.

Part of Sellafield Ltd's own science and engineering week, the forensics day was designed to cover topics that fall within the Applied Science GCSE curriculum.

Thanks to the help of Dave, Angela and James from Thinkforensic Ltd, the pupils were given an introduction to the science behind the world of forensics before looking at the role of the forensic science officer and the different branches of evidence and forensic analysis.

The students then put on full forensic suits before learning how to take their own fingerprints and analyse them as well as how to dust for fingerprints at a crime scene.

In their teams, the 'detectives' then had a go at investigating their own crime scenes and began the scientific process of gathering evidence and looking for clues. They had to communicate to the team leader what they were doing and why and also bag up and record the evidence they removed from the crime scene.

The bodies, some surrounded by blood spatters, others crawling with 'maggots', lay among a number of crucial pieces of evidence ranging from the murder weapon, wine glasses and bottles and threatening notes and letters.

Satisfied with their findings the teams returned to the labs to begin analysing and recording their findings. Dave, an ex

policeman and Angela an ex CID/Drugs squad officer then discussed forensic entomology – the science behind being able to determine the length of time a body has been decomposing by the type and development stage of the maggots or insects inhabiting the body.

Bit by bit the pupils, using all the evidence they had obtained, were eventually able to prove that their suspect was guilty despite claiming to be out of the country at the time of the crime.

Pauline Farrell said: "This was a brilliant way to end our own science and engineering week. The Thinkforensic team held the pupils interest from the very beginning to the fascinating conclusion. It really was a great way to cover a topic that is now on the Applied Science GCSE curriculum."



## News from Yottenfews

### Mayfield youngsters brave the elements on World Environment Day

Despite the treacherous weather conditions nothing could dampen the enthusiasm of a group of students from Mayfield School who visited the Yottenfews project on World Environment Day on 5 June.

Leader of the Yottenfews Environmental Education Project Millie Clarke invited the students to enjoy the outdoors at Yottenfews and use their senses to think about caring for living things.

Braving the elements, half the group carried out a mini beast hunt, pond dipping and visited the sensory beds. This was followed by a man-made trail through the woods to identify man made items such as cans, bottles and bags which should not have been there.

In the warmth and comfort of the Sellafield Centre the remaining half of the group worked with Sellafield Ltd Science and Engineering Ambassadors to make their own edible oil wells using chocolate syrup, milk, rusks, crushed meringues and chocolate mousse - drilling for oil using a drinking straw. The group talked about where oil comes from, what it is made of and the difficulties faced during extraction.

Meanwhile the second group made their own bird cakes, using lard, oats, raisins and sunflower seeds. Each student was given a bird bag template to take back to school, a bird restaurant menu to complete and a bird identification chart to record which birds enjoyed their cakes.

The group then went on to discuss recycling and talked about how important it is to recycle as much waste as possible. They then tackled the mini mountain of recycled

materials collected by staff from the Stakeholder Relations team to make their models including a puppet theatre, a light sabre, dog kennel and many more creative structures.

The groups then swapped over after lunch to make sure they all tried everything - and all got equally wet!

Speaking about the day, Millie Clarke said: "The students seemed to thoroughly enjoy themselves. At the end of the day each student was given a plastic sports drinking bottle to take away together with a pedometer which had been kindly donated by Sellafield Ltd's energy management team.

"The students also made a lovely booklet containing their thoughts, comments and photos to give to the Science and Engineering Ambassadors who helped out on the day. This was greatly appreciated."



## Living Willow Tunnel for Yottenfews Environmental Project

The Yottenfews Environmental Project has a new living willow tunnel in the grounds, thanks to the help of children and adults from Lamplugh School.

Pupils worked under the guidance of local craftswoman Helen Elvin, and staff from the Sellafield Education Team to construct the tunnel, with the help of Jamie D'Souza and George Royston-Bishop from Sellafield Ltd's Environmental Management team.

The willow, which was cut from the Yottenfews grounds, is a sustainable plant which will benefit from being cut as it will grow new shoots which can be harvested again next year and used to extend the tunnel.

Apart from making the tunnel, the children from Lamplugh School also designed and made their own board games with an environmental theme and used dried willow to make and decorate a gift to take away.

Ann Francis Head teacher of Lamplugh School said, "It has been a very enjoyable, inspirational day; the children have worked on a wide variety of activities all of which were well organised. Thank you."

The tunnel has been incorporated into one of the paths so it can be enjoyed by visiting groups.



## News from Yottenfews

### Fun learning about camouflage

Children from St James' Junior School Whitehaven had a fun day at the Yottenfews Environmental Project learning all about camouflage, as part of National Science Week.

The 25 pupils studied pictures of caterpillars to learn about how insects use camouflage in order to prevent being eaten. They then collected natural materials such as dead leaves, pine needles and small pieces of twigs in the woods to make their own camouflage. They then disguised a series of small caterpillars that they had made in the trees.

The pupils then challenged one another to see if they could spot each others caterpillars. Millie Clarke, Yottenfews Manager said, "The children were surprised at the variety of different caterpillars we have and really enjoyed this activity which required them to be very dexterous.

"They liked being in the woods and looking for each others caterpillars hidden on the tree trunks; most of which proved very hard to spot."



### Birds of prey visit - Yottenfews

A group of students from Cockermonth After School Scheme recently visited the Yottenfews Project at Sellafield to learn about birds of prey.

The group of 22 five to eleven year olds visited Sellafield on 14 August and got to meet a selection of birds including a buzzard, barn owl, golden eagle, Harris hawk and a raven.



The birds were brought from Silverband Falconry, Penrith by handler Richard Cooper. Richard gave an educational talk on each of the different birds, as well as a flying display, before carrying out discussions on how each of the different birds catch their prey. There was then a handling session in which the children each got to hold and enjoy a number of different birds close up.

Sophia (photographed), aged five from Gillgarran, was all smiles as she got to catch the Harris hawk on her hand, simply saying "it was really nice." Hilary Stange, play scheme leader said: "It was fantastic to see the children being able to have a 'hands-on' experience and Richard was very good with them.

"The children seemed to especially like the large golden eagle and the comical

raven. They also liked it when the Harris hawk ran between their legs. Their attention lasted from start to finish; a very interesting display of birds of prey and an excellent presentation from Silverband Falconry."

Millie Clarke, leader of the Yottenfews Project at Sellafield Ltd added:

"We invited Silverband Falconry so that the youngsters could see some of the birds that can be seen around the Lake District fells close up, particularly the buzzard and the raven.

"I hope that if children enjoy interacting with wildlife, and there is nothing more impressive than birds of prey, they are much more likely to want to care and respect it."

### Yottenfews Planner

To help schools plan where Yottenfews could fit into the National Curriculum, the table below lists the main visits available:-

Year	Main themes
Rec	<b>First hand experience</b> , observation, sensory beds, listening, woodland trail, looking in pond trays.
KS1	<b>Comparing seasons, animals &amp; plants in the environment</b> , mini beast hunt and use of tally to record, looking in pond trays or short pond dip, woodland trail, work on Materials,
Y3	<b>Rocks &amp; soil</b> - permeability of soils, permeability test on rocks, look and collect various rock types, accurate timing & measuring water, fair testing. Runs from 15th November to 1st March
Y4	<b>Habitats including food chains</b> , detailed study of wood and pond dipping, keys available, various habitats large and small such as orchard, logs, grassland, hedge, wall, wild flowers, herb bed .
Y5/6	<b>Investigating rivers</b> - including mans influence and historical aspect, middle and lower course visited with meanders, river mouth, confluence, erosion and deposition etc

## PEDAL POWER

Members of the Junior Engineer's Club got to play the roles of Formula One stars Lewis Hamilton and Jenson Button at their annual race day event, held as part of Science and Engineering Week.

Working alongside Science and Engineering Ambassadors (SEAs) from Sellafield Ltd, the teams had to design and modify a pedal powered go-kart to make it more aerodynamic, improve the kart's appearance as well as design a brake light system – before they got to race.

Held at the Rowrah go-karting track, the event involved St Benedict's feeder primary schools – St Bridget's (Bridget's



Beasts), St Patrick's (Shooting Shamrocks), St Begh's (3rd Gear) and St Joseph's (Joseph's Jets).

On the day, the teams had to complete two sets of four laps. This also included compulsory pit stops to change a wheel and a brake light. Points were also awarded for best kart, brake light system and project folder. St Joseph's won the competition.

Speaking after the race Mrs Preston, a teacher from St Begh's, said: "It's been a challenging experience. The children have given everything and have built a very positive team spirit."

Sellafield Ltd SEA Trevor Palmer was on hand to help give out the trophies to the winning teams. Speaking about the event Trevor said: "It was a very enjoyable day and the children had a great competitiveness about them, some of the ideas that the competitors transferred to the go-karts were very unique and they all had a part to play before the race day. This is a great activity for them to learn new skills and

be able to demonstrate what they have achieved."

Speaking on behalf of Sellafield Ltd Pauline Farrell said: "We are very happy to be sponsoring the event and were happy to fund and support in any way possible.

"It has been a very rewarding experience. I'd like to say a big thank you to everyone who has taken part this year – especially all the SEAs for their hard work. I'd also like to say a thank you to local celebrity and Disney Channel star Brad Kavanagh who did an excellent job at comparing the event – he went down a treat with the adults and children."



## The Eggs Factor

Have you ever given a second thought to the many different forms of material that make up the every day fabric of our life?

After all when did you last think twice about switching on a computer and how many of us could function without our mobile phone?

However without the skills of mining engineers to access the earth's natural resources and the innovative ideas of scientists and engineers many of our 'every day' items just wouldn't exist.

For Year 9 students from Millom, St Benedicts and Netherhall schools, gaining a greater understanding of every day materials was all part of a fascinating presentation on 'Materials in Action' delivered by Dr Diane Aston, Education Co-Ordinator for the IOM 3 (The Institute of Materials, Minerals and Mining) during our recent Material Science day.

Following the presentation the students were split up into teams before being given details of their challenge for the day - to design and build a crash helmet for a fresh egg which would be able to protect it when dropped from a height of a few metres.

As part of the 'tool kit' for their challenge each team were given a fresh pre-weighed, numbered egg together with a small bag of materials - a small piece of bubble wrap, a length of tape, a small piece of sponge and some polystyrene packing chips.

Working as a team within tight time deadlines and with limited resources, the students were asked to come up with a consensus of the best 'crash helmet' design that would not only provide the best possible maximum protection but as a further complication add as little extra weight as possible. The team that produced the lightest suit that protected the egg would be crowned the overall winners.

Coming up with the team names created some lively discussions with

some cracking good ideas including - The Eggheads, KL Eggs, Egg Dunkers and Get Cracking.

Once the eggs had been safely wrapped in their crash helmets they were all re-weighed and as the tension in the room mounted, the drop tests began. All the eggs were wearing various forms of egg Personal Protective Equipment and as could have been anticipated some fared a lot better than others.

At the end of the drop test the casualties were subject to rigorous medical checks by the ambassadors and local IOM3 branch members with the fatalities unceremoniously (humpty) dumped!

At the end of the day certificates and chocolate bars were awarded to the teams who had created the best design and also those who came up with the best team names, with 'San n Ella' and 'Feggy Egg' receiving a special mention.



## Pupil POWER

### STEM AMBASSADORS CRUISE

Our education support programme wouldn't exist without the enthusiasm, knowledge and brilliant ideas of our growing band of STEM ambassadors

In recognition of all their hard work and dedication, Cumbria Stem centre organised a leisure cruise around Lake Windermere for all the Cumbrian STEM ambassadors, supporting ambassadors and supporting organisations.

On a relatively warm evening we were all welcomed on board by Tony Gill, Director of Cumbria Stem centre who passed on his thanks for all the good work being done around the County.

The evening continued with a couple of short speeches from both the ambassador's and a student point of view, which highlighted the benefits of the scheme. There was also time for a photo opportunity of the award winners from the recent House of Lords awards ceremony.

The consensus from all who attended was that it was a fantastic evening, with an informal and relaxed atmosphere and a lovely opportunity for ambassadors to actually have time to chat to each other instead of running activities.

Pauline Farrell said: "on behalf of the Sellafield Ltd contingent I'd like to say a massive thank you to Tony and his team for organising the cruise".



### Seascale pupils go mad for science!

Seascale school students went mad for science as part of a science activity week, with the help of Keith Dowber (Process Network Engineer) and Phil Robinson (Thorp laboratory) from Sellafield Ltd.

Keith and Phil delivered three sessions to over 30 pupils, aged between five and nine years old as part of the activity week, designed to allow pupils the opportunity to try out different arts, crafts, sports, activities and sciences that they wouldn't normally get as part of their normal curriculum.

The first activity was to build a Franklins Bell. Although not used in this instance to detect approaching electrical storms, the challenge was to build a high voltage generator using static electricity from an old TV screen. Using only two tin cans, two wires, crocodile clips, a pen, cotton, a paper clip and some tin foil the pupils managed build their own bell and the initial spark went down a storm!

The second activity which looked at magnetism involved the pupils creating a Gauss rifle using ball bearings with magnets to show how it increases velocity when a ball bearing passes from one to another.

The last activity, designed to stir things up, involved mixing cornflour with water to look at liquids and solids studied the transformation process and quantities needed to make one change to the other.

Speaking after the event Keith said: "A great time was had by all and even the youngest pupils wanted to know every detail of what they were trying to do. The pupils had a lot more knowledge than expected and offered up their own ideas on how to improve and expand the experiments.

"It's great to see enthusiasm in science so young and we will expand the sessions we ran this year to try and get more involved next year."

### Lights...camera... action...!

Charlotte Bailey, a Science and Engineering Ambassador from Analytical Services has been chosen to appear in a new teachers' television project.

Local STEM (science, technology, engineering and maths) centres recently appealed for Ambassadors willing to be filmed with students sharing their enthusiasm in these disciplines and Charlotte stepped up to the challenge.

First Charlotte travelled to London to audition in front of a panel including the harshest critics of all – two students. After answering a barrage of questions she then had to deliver an activity she would typically do in her role as an ambassador.

Charlotte had prepared various bubble mixtures of differing viscosity and the students had to predict whether bubbles would be created, what shape they would take and how they would react.

Beating off stiff competition Charlotte was chosen and a media team travelled up to West Cumbria to film Charlotte at work, at leisure and working in a school.

As the new resource will be aimed at key stage three students, Charlotte visited St Benedict's School Whitehaven where she carried out the following activities with the pupils – whoosh bottle, bubble-ology, methane bubbles and the screaming jelly baby!

Speaking about the shoot, Charlotte said: "I enjoyed the filming; it was a new experience for me and a great way of promoting the STEM ambassador scheme. It's also a great way of showing how supportive Sellafield Ltd is in promoting science activities in school."

Pauline Farrell, Sellafield Ltd's education and community relations officer passed on her congratulations: "Charlotte has helped out on many occasions and has devised experiments and led activity days within some of our schools. She has a real affinity with pupils of all ages and has been a great supporter of our education support programme."



## Smart darts 4 kids

School children in west Cumbria are on target for improved maths skills thanks to Sellafield Ltd's latest donation.

Smart darts 4 kids games have been given to primary feeder schools to both Whitehaven and Cockermouth Schools.

The games, consisting of a magnetic metal frame supporting a number of different dart board designs used to work out various mathematical equations using the magnetic darts, are a great way of developing numeracy skills in school and at home.

The choice of boards allow pupils to choose games incorporating multiplication, division, addition, subtraction and percentages personalising and accelerating the acquisition, recall and application of number facts.

Pauline Farrell said: "the smart dart games provide a novel way for primary school pupils to work on problems without realising they are progressing their maths skills. We've been practising in the office but I don't think that Phil 'The Power' Taylor has anything to worry about just yet!"

Helen Tinnion, Head teacher at Bridekirk Dovenby primary thanked Sellafield Ltd for the donation of the smart darts for kids games, stating that "We place a great deal of importance in developing numeracy skills within the curriculum at Bridekirk Dovenby School and our staff are constantly differentiating work to meet the needs of individuals and groups of pupils."

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## Feedback form

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### 1. Have you found Pupil POWER Newsletter:

Very Useful       Useful       Not useful

### 2. What did you like or dislike about it?

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### 3. What else would you like to receive information about on a regular basis?

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please return completed forms to Pauline Farrell - pauline.j.farrell@sellafieldsites.com



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