Discoverers

Inventors

Innovators

Sharing Good Practice
Science, Technology, Engineering and Mathematics (STEM) have been identified by industry and government as important for the global economy and therefore are an imperative for the Northern Ireland economy, not just today but for the future. As such, the Areas of Learning in the curriculum that contribute to STEM are important for schools.

The Northern Ireland Curriculum is designed to ensure STEM is not seen as an add-on, but integral to teaching and learning. It is important that young people appreciate the relevance of STEM and are provided with motivating experiences which engage them. It is hoped that more young people might consider a STEM related career as an attractive and accessible choice.

We live in an age where pupils are motivated by emerging technologies that surround them in their everyday lives. Technology applications have a huge impact on the future success of STEM. We can see this already through innovations such as connected health, food traceability and fibre optic connectivity.

Using ICT is identified as a cross curricular skill within the Northern Ireland Curriculum. As such, every teacher has a responsibility to contribute to the acquisition and development of it. Experience of Using ICT across a range of Areas of Learning offers rich and relevant contexts for pupils and their learning. If we can capture pupils’ motivation by technology and interest in STEM issues we can start to make an impact.

I would like to thank everyone involved in the STEM Heroes project and who were willing to share their work with schools across Northern Ireland. I trust that the examples of good practice in this publication will contribute to encouraging engagement with STEM and the development of Using ICT skills; which in turn may have positive implications for practice in all schools here in Northern Ireland.

Richard Hanna
Director of Education Strategy
CCEA
In 2011, all schools received the CCEA ‘Ordinary Heroes’ comic. Its purpose was to celebrate some of the ordinary people in Northern Ireland who have achieved extraordinary success in the areas of STEM.

The comic proved very popular with schools, and so, to maintain this enthusiasm, the STEM Heroes project offered an opportunity for all schools across Northern Ireland to celebrate and share STEM Heroes in their local community. CCEA encouraged schools to use ICT to share their chosen heroes. This publication gives a summary of some of the exciting work that was carried out by pupils in both Primary and Post-Primary schools.

The objectives of STEM Heroes sharing good practice are to:
- promote greater involvement of STEM and Using ICT within the curriculum;
- identify and share effective existing practice;
- provide ideas and stimulus for schools that are keen to engage with STEM/Using ICT; and
- celebrate the STEM/Using ICT work that schools are undertaking in the interest of young people.

Although we were not able to showcase all of the schools who registered, they are all valued and all the schools are to be commended.

Once they had completed their work on their chosen local STEM Hero/Heroes, pupils were asked to complete a STEM Heroes ID Card like the one below.

The information included is explained below:

Through this work pupils learned about innovators, inventors and discoverers. Many of the STEM Heroes were a combination of two or even all three of these but ultimately pupils chose the ‘best fit’ description of their heroes.

Many of the STEM Heroes have a list of great achievements but schools were asked to select the one that most impressed them.

A list of *STEM Powers was provided for the pupils. These included some of the skills and capabilities that are key to the success of any STEM Hero.

*The STEM Power list included analysis, communication, confidence, creativity, curiosity, determination, enterprise, enthusiasm, focus, imagination, initiative, inspiration, logic, motivation, open-mindedness, opportunism, originality, patience, perseverance and teamwork. This list allowed teachers to draw comparisons with the skills and capabilities framework and attitudes and dispositions from the Big Picture.
Pupils in Year 8 were investigating some of their local STEM Heroes during their Science lessons, including:

- David Perry;
- Peter Fitzgerald; and
- Dr. Jocelyn Bell Burnell.

It was apparent that both the pupils and the teacher, Mr. Robert McKee, had enjoyed researching their heroes online and sharing information within the class.

What made it particularly exciting for these young people was that they were working in a beautiful ICT suite which had been donated by Peter Fitzgerald who was one of these heroes. This close connection with the ‘man himself’ made learning about him even more relevant.

“It’s silly that people used to think science was only for boys. I’m a girl and it’s one of my favourite subjects.”

Pupil

“I until I heard about David Perry I didn’t think game designers came from Northern Ireland.”

Pupil
When CCEA popped in to visit pupils from Bangor Grammar School they were busy researching a range of local STEM heroes. Their task was to present their nomination to the class. After a democratic vote the majority were really keen to learn more about their chosen local STEM hero, Jonathan Bloomfield, a Sports Scientist and Performance Consultant.

As a result of their interview with their hero the pupils decided to put their own ICT skills to the test and intend to create a five page comic of their chosen hero’s life-to-date to share with other pupils in the school.

The experience showed pupils a realistic career path (mistakes included!!) for science students to follow. It also highlighted the importance of ICT skills for work.

They found out about his background, career path and aspirations for the future. They were particularly interested in his work with famous people! (he was Jonny Wilkinson’s kicking partner!) Jonathan told them about the importance of being able to use ICT to carry out his daily work. He showed them how he uses ICT to collect data, process it, analyse and interpret it and to generate reports.

"AMAZING WHERE HE HAS BEEN WITH WORK." PUPIL

"COOL JOB!!" PUPIL
Pupils in the after school STEM Club were learning about the life of their local STEM Hero Bertie Fisher. They were also keen to highlight the achievements of a local company Balcas. The pupils and their teacher Mr Bernard Dooher were busy researching information about STEM Heroes, watching videos and preparing presentations.

While they felt that they could not identify one individual within the company as a STEM Hero, they were convinced that a product that was being sourced from local, sustainably managed forests deserved to be celebrated.

Equally interesting for the pupils was the realisation that Bertie Fisher, so well known locally, nationally and globally as a rally car driver, had also established his own engineering company.
There was a real STEM Heroes buzz amongst the pupils at Kells and Connor Primary School. STEM activities were in full swing and many examples of Using ICT could be seen.

They used ICT to create animations, podcasts, and even their own comic. It was hard to pull the pupils away as they worked on their i-Pads, MacBooks and Lego to realise their ideas.

The pupils went further and built their own motorised Lego tractors and ejector seats!

They were keen to investigate the speed of their tractors and look at ways to make their ejector seat eject their Lego man into the air.

Other heroes who were researched by the pupils included Harry Ferguson and Thomas Andrews.

“I GO TO DRAMA CLASSES AND LIKED SPEAKING ON THE PODCAST, INFORMING LISTENERS OF THE STORY OF THE TITANIC.”

PUPIL

“I JAMES MARTIN IS MY STEM HERO BECAUSE HE USED EXPLOSIVES TO GET THE EJECTOR CHAIR IN THE AIR AND I FIND THAT REALLY INTERESTING. FOR MY OWN EJECTOR SEAT MADE OUT OF LEGO I USED THE CLIP FROM MY SLEEPING BAG TO SHOOT THE LEGO MAN UP IN THE AIR!”

PUPIL
Mrs Lisa Gregory’s Year 9 class was keen to learn about as many different local STEM Heroes as possible, so they chose:

- Thomas Andrews;
- Francis Crozier;
- Harry Ferguson;
- Sir Allen McClay;
- Lilian Bland;
- Sir Joseph Barcroft;
- Professor Dermot O’Hare; and

The girls had worked in groups to prepare posters and presentations celebrating the lives of their STEM Heroes.

Two of them were excited to realise that the street where their relatives lived had been named after Sir Joseph Barcroft, while another girl found out that her father had gone to school with Professor Dermot O’Hare.

This meant that some of them were able to involve their families in the research of their projects and to include personal anecdotes and experiences in their work.
Pupils at Phoenix Integrated Primary School took part in the STEM Heroes project and enjoyed learning about inspirational people who have made an impact in the areas of Science, Technology, Engineering or Mathematics. They were particularly keen to explore inventors and innovators and traced key people from as far back as Victorian Times.

As part of their work the pupils carried out research using the internet and books to answer many of the questions they had about inventors and innovators. Much of their interest lay in those heroes who were local to where they live today.

Once the pupils found answers to their many questions they prepared presentations for their peers and created an eye catching wall display for others to use. Pupils enjoyed finding out about achievements from local people and enjoyed the research aspect of the learning. They were really proud of the fact that Ernest Walton went to school in Cookstown! Their teacher emphasised the fact that maybe one day they too would be remembered for their inventiveness or innovation!

**Name:** Ernest Walton  
**Year Born:** 1903  
**Town:** Abbeyside  
**County:** Waterford  
**Local Connection:** Went to school in Tyrone  
**Claim to Fame:** Inventor  
**Achievement:** Awarded a Nobel Prize for building apparatus capable of ‘splitting the atom’  
**STEM Power:** Inspiration

“WE COULD BECOME INVENTORS IN CLASS.”  
PUPIL

“PUPILS ENJOYED THE LEARNING OPPORTUNITIES AND ACTIVE TEACHING STRATEGIES INVOLVED AND IT MOTIVATED PUPILS IN THE SENSE THAT THEY FEEL THEY TOO COULD BE INVENTORS/INNOVATORS.”  
TEACHER
Enormous fun was had as they prepared their PowerPoint presentations about various aspects of Thomas Andrews’s life story, editing and adding sound and animation to illustrate their slides.

Throughout this work each group had a designated camera person shooting either digital stills or filming the investigations. Once complete they were able to upload their footage and to watch it back as they completed the written recording of their work.

Arriving in the tranquil primary school of St. Brigid’s Primary School right in the quiet heart of Northern Ireland’s countryside, no-one would expect the hive of activity that was buzzing in Mr Declan Mason’s Primary 7 classroom. For this group of pupils there was only one STEM hero worth focusing on:

- Thomas Andrews.

They had been learning about the story of the Titanic right across the curriculum and were particularly thrilled with the local connection that they had made with its designer. They spent time investigating which materials would float and which would sink. Then they pushed the experiment further by exploring who could design the plasticine ‘ship’ which would float and carry the most cargo.
Pupils in Year 7 at Wallace High School Preparatory Department were celebrating a number of STEM Heroes from Northern Ireland using the theme ‘On Top of Your Game’. They were involved in finding out about the following heroes:

- Mary Ward;
- John Dunlop;
- Harry Ferguson;
- James Martin;
- Frank Pantridge;
- Jocelyn Bell Burnell; and
- Oliver Hutchinson.

The enthusiasm from the pupils was evident in the amount of research they carried out, both in school and from home. Pupils enjoyed a range of learning activities including their very successful Heroes Day where they had the opportunity to dress up as their hero and take part in hot-seating drama activities.

Pupils were developing their Using ICT skills in a range of ways, such as: creating comics of their heroes on their I-Pads, creating a podcast autobiography of their hero using the Audioboo app, and making PowerPoint presentations for their peers to inform them of the extraordinary achievements of their chosen hero.

The teacher, Mrs Corinne Latham, reported that the project raised pupils' awareness of what they can do if they choose to study STEM subjects and helped them to see how STEM discoveries and inventions have influenced our lives today.
Visit STEMWorks at www.nicurriculum.org.uk

Make sure you regularly check out our STEMWorks website to get the most up to date information on exciting new developments or resources for STEM.

Visit STEMWorks at www.nicurriculum.org.uk

A CCEA Publication © 2012