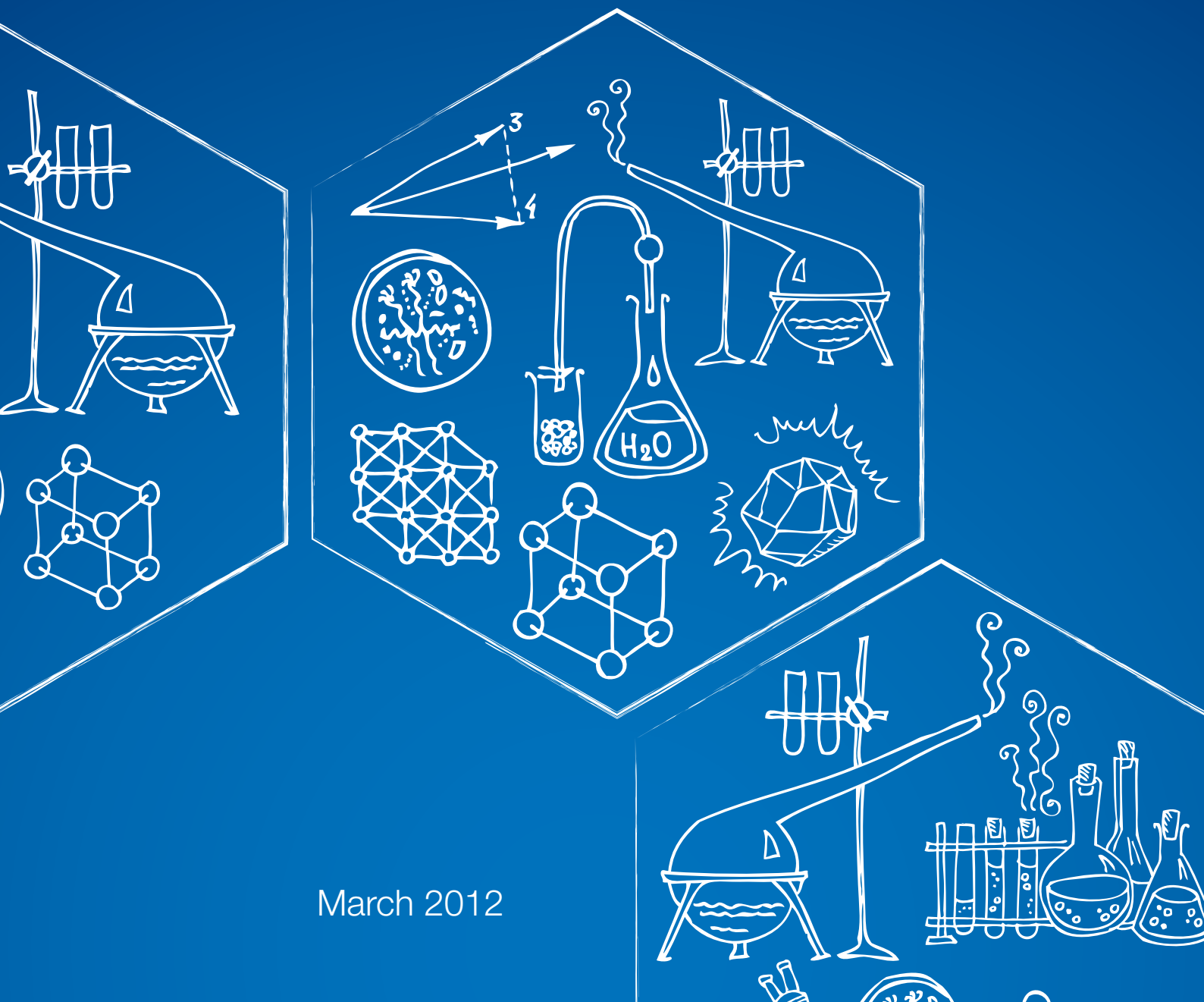
SUCCESS THROUGH STEM

ONE YEAR ON



March 2012

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FOREWORD

As the world becomes increasingly dependent on technology, it is envisaged that the range of businesses emerging around science, technology, engineering and mathematics (STEM) themes will grow significantly. The Economic Strategy, produced by the Executive, identifies five sectors within STEM related areas, which will be targeted in the coming years as they have the greatest potential for growth.

The challenge for NI is that this envisaged growth in STEM areas is not being matched by a sufficient growth in the number of young people choosing to study these subjects at school, college and university. This is creating the potential for a mismatch between the future demand for skills in these areas and the supply of people with these skills. As this has the potential to hold back growth, it is an important issue for the Assembly, Business and the Education artery.

Following the publication of the independent 'Report of the STEM Review', I was asked by the then Ministers of Education and, Employment and Learning to Chair the implementation group to take forward the STEM Strategy, known as 'Success through STEM'. The Strategy was endorsed by the Executive in March 2011.

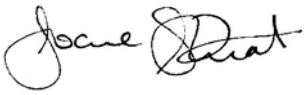
The implementation of the STEM Strategy brings together a number of Departments across Government along with representatives from Business. Our shared objective is to help equip our workforce with the skills in STEM necessary to support the needs of business.

'Success through STEM' is an important element of the Executive's commitment and on-going efforts to rebuild and rebalance our economy. Through its implementation we aim to provide the skills base to attract more Foreign Direct Investment which is STEM based and provide the skills to expand our indigenous STEM based businesses.

Since gaining Executive agreement, there has been an increasing level of collaboration between industry and Government aimed at encouraging more people to study these subjects and choose careers in these important sectors of the economy.

Excellent progress has already been made with numerous activities involving Government, schools, colleges, universities, local businesses and other key delivery agents being taken forward.

It is the aim of this 'One Year On Report' and associated event to celebrate this work, demonstrate the initiatives and programmes that have been put in place as a result of the Strategy and highlight the collaboration that is required to successfully implement this strategy.



JOANNE STUART OBE

Chair of the STEM Implementation Steering Group

1. STEM DELIVERY STRUCTURES

Following the publication of the 'Report of the STEM Review', a cross-departmental group, at official level, known as the Government sub group was established to take forward all the government recommendations within the Report. It includes representatives from:

- the Department for Employment and Learning (DEL);
- the Department of Education (DE);
- the Department of Agriculture and Rural Development (DARD);
- the Department of Enterprise, Trade and Investment (DETI);
- the Department of Culture, Arts and Leisure (DCAL); and
- the Department of Health, Social Services and Public Safety (DHSSPS).

The group produced the STEM Strategy, 'Success through STEM', which was published for public consultation in August 2010. The final Strategy was approved by the Executive in March 2011.

The STEM Strategy, which is available on the publications section of the DEL website, outlines:

- the role of the demand side;
- the role of the supply side;
- recommendations for action;
- structures for implementation;
- priority actions;
- existing government STEM activity; and
- an action plan.

THE GOVERNMENT SUB GROUP

The Government sub group has met frequently. This has led to greater joined up working and co-ordination between Departments. Communication has greatly increased and discussions have taken place on how to liaise on initiatives such as utilising resources, maximising content of websites, sharing stakeholder details and STEM careers education, information, advice and guidance. While the Government sub group meets frequently, each Department is responsible for taking forward its own actions.

A greater understanding has been developed of each Department's roles and commitment in relation to STEM, and how these link to wider government policy such as the Economic Strategy.

While government has a clear role to play in taking forward the STEM agenda, the 'Report of the STEM Review' highlighted the important leadership role that business needed to take – not least in terms of improving the attractiveness of the sector. Recommendations 1-5 relate to business.

BUSINESS SUB GROUP

In recognition of the key leadership role that business must play, a Business sub group was established to take the leading role in promoting STEM and facilitating engagement between Business and the education artery.

Terms of Reference have been agreed and individual members of the group have accepted responsibility for taking forward one of the five recommendations allocated as 'business-led' from the' Report of the STEM Review'. The group represents a single forum where key stakeholders and delivery partners can discuss and coordinate STEM related initiatives. Thus, in addition to business representation, the group includes representatives of charities and other delivery organisations involved in STEM promotion.

In terms of the governance, the Government and Business sub groups report to an overarching **STEM Implementation Steering Group**, led by the chair of the Business sub group, Joanne Stuart.

2. PRIORITY ACTIONS

In the Government strategy 'Success through STEM', the vast array of work already being taken forward was detailed. In addition, the strategy included the actions that Government would take forward with a view to building the supply of STEM skills to meet the demand for STEM skills as it grows in the years to come.

Three areas were identified as priorities for the Executive to take forward in the short term, and for this report we have focused on the work done in these priority areas which are:

PRIORITY ACTION 1 - Co-ordinating Business Links

PRIORITY ACTION 2 – Manage STEM sector attractiveness

PRIORITY ACTION 3 – Facilitate STEM Continuous Professional Development

PRIORITY ACTION 1: Co-ordinating Business Links

As noted in the STEM Strategy, better linkages with local companies, particularly SMEs and micro businesses, will facilitate a more coordinated approach to articulating local demand, improving sector attractiveness, highlighting available opportunities, continuous professional development and careers advice and guidance. Engaging with these companies is the single biggest challenge in taking the STEM Strategy forward.

The following actions have taken place:

- The STEM Business sub group (SBSG) has met with key stakeholders from, and funded by, the Department of Culture, Arts and Leisure, the Department for Employment and Learning, and the Department of Education in a series of focussed workshops. The aim of these workshops was to understand the STEM related activities which are already ongoing, in order to begin to map activities across the various stakeholders, with the aim of improving coordination of ongoing STEM activities and promote more sharing of knowledge and best practice.
- The SBSG has established a database of local STEM companies to help them gain a better understanding of the types of STEM companies and the level of engagement with local schools, colleges and universities. An exercise to map STEM businesses with the education artery is currently underway in order to improve co-ordination and engagement. The group has also met with various employer bodies such as the NI Chamber of Commerce and Sector Skills Councils to explore how they can help them to communicate key messages to local STEM businesses.
- An innovative STEM networking event was organised by delivery partners Business in the Community (BITC) with the aim of increasing interest, raising awareness and inspiring young people and employers to engage more with STEM. The event, which took place at De La Salle College, Belfast was structured in conjunction with W5, STEM ambassadors, training providers and various STEM Businesses with over 120 pupils attending. STEM stakeholders involved included Bailie Connor, Belfast City Council, Bombardier, Citi Group, DARD, the Engineering Training Council, Northern Ireland Environment Agency, Northgate, Triplicate Design and Ulster Bank. In addition to the promotional stakeholder networking event, those attending had the opportunity to experience a W5 science workshop and a competitive spaghetti marshmallow challenge arranged by BITC.

- The SBSG commissioned BDO to carry out analysis on the results of a survey conducted to explore the level of business engagement with the education artery. Several conclusions were drawn from the analysis of the results, which returned 70 responses, including the identification of engagement barriers. The key points from the survey included:
    - The key reasons given for not engaging were a lack of resources and understanding of benefits
    - Lack of co-ordination of activities across STEM Landscape
    - Schools not aware of all STEM career opportunities
    - Main benefit – better awareness of business and improvement of STEM skills
- This research, together with feedback previously gained from other SBSG members and stakeholders, will be used to help prioritise the objectives for the group over the second year of 'Success through STEM'.
- In the area of Applied Sciences work has taken place by South Eastern Regional College students to develop an anti-bacterial soap using recycled canteen oil, which has led to the creation of a new business opportunity. The students involved received a 'highly commended' award in the BT Young Scientist competition in January 2012 and have been selected along with 30 others to undergo the prestigious BT Business and Science Programme at University College Dublin.
- In response to a shortage of ICT Professionals, DEL has introduced a 'Software Testers Academy' in 2011 under the 'Assured Skills' initiative. The programme has been designed by NI's top ICT companies, and also received support from Invest NI. Targeting HND or degree graduates from any discipline, the Academy has offered an intensive 14-week training programme, including a company placement, to 20 successful applicants. Successful participants will gain an industry recognised qualification and a potential offer of employment. This initiative was massively oversubscribed and a further intake is likely in the coming year.
- As part of the ICT Action Plan, a Capital Markets Technology Programme has been launched by Invest NI in collaboration with the higher education sector and business, delivering 30 places.
- In response to the identified need to up-skill the current workforce, DEL is taking forward a pilot of a Level 4 Apprenticeship programme in the ICT and Engineering sectors targeted at existing or newly recruited employees.
- DEL has introduced the 'Skills Solutions' service which provides a direct mechanism by which employers can work with the Department to address their specific training needs. In terms of STEM associated activities in the last year 405 staff have been trained in Business Improvement Techniques in 40 companies, seven staff have availed of customised training and under Bridge to Employment 53 unemployed people have successfully moved into a job.

"A workforce skilled in science, technology, engineering and maths is fundamental to Northern Ireland's future competitiveness and wealth creation potential. Inspiring our young people to study these subjects and then choose a career in these areas requires a collaborative effort between Government and STEM companies. This report highlights the excellent work that is already taking place and the contribution that this Department's delivery partners, such as our local colleges and universities are making to this important agenda."

Dr Stephen Farry MLA

Minister for Employment and Learning

- The Economic Strategy places a clear focus on the need to both 'rebalance' and 'rebuild' the Northern Ireland economy and sets out a plan to grow a prosperous local economy over the short, medium and longer term to 2030. In support of the draft Economic Strategy and these aims DEL will focus its employment and skills interventions on priority sectors in order to bring about the biggest positive impact on the economy. The priority skill areas with the greatest economic significance which are constrained by skill issues and which will help rebalance the economy are:
  - Business Services (specifically ICT);
  - Financial Services
  - Manufacturing (including food and drink and agri-food, advanced manufacturing and advanced engineering); and
  - The emerging sectors of life and health sciences and the creative industries.

  Industries which will help to rebuild the economy both in the short term and in the future are:
  - Tourism and hospitality; and
  - Retail.
- In order to encourage more students to pursue a career in STEM areas, DEL has initiated a project to encourage more local employers to offer placements and scholarships for people studying in further education and higher education. The SBSG is actively involved in this area and will be providing guidance for employers and best practice case studies.
- DETI, in conjunction with DEL, has established a Foresight and Horizon Scanning Unit which will bring key people from business, government, academia and wider society to identify future market opportunities. Within the Unit, the existing MATRIX group will provide industry led expert advice on the primary drivers to assist future industries to develop. A key component of the Foresight Unit will be to identify the future skills, particularly the STEM skills, required to enable these industries to flourish and grow.
- At Belfast Metropolitan College, the increasing focus on Life Sciences has led to the creation of the BioScience Skills Academy followed more recently by the signing of a Memorandum of Understanding between the college and BioBusiness. This will ensure the continued development of the partnership between the Life and Health Sciences industry and further education colleges. The relationship will be further underpinned by the opening of the college's new e3 campus, which took place in February 2012 and which will see the creation of a Health and Life Science Hub to support skills development and knowledge transfer.
- W5 continues to develop new and sustain existing links with business and academia to enrich the STEM provision available at W5. Over the past year such links have included Northern Bank 'Science Counts' which involve rural outreach and in house programmes for 26 Primary Schools, education programmes to 22 urban Primary Schools and outreach to 9 Post Primary Schools.
- W5 delivered in one year 1,367 STEM related events and went to 137 different locations to deliver STEM outreach over 250,000 people take part in STEM activities raising the profile of STEM, with W5.
- In partnership W5 and Bombardier have developed a wide range of education initiatives including:
  - Flight Focused workshops for pupils (Key Stage 2-Key Stage 4)
  - Annual Flight Competition for over 200 pupils (Key Stage 2- 4)
  - Flight Demonstration Shows for schools and the public
  - 'Your Career in Aerospace' Events for Key Stage 4 pupils
  - Engineering a Flight Events for Key Stage 4/5 pupils
- In July 2011 W5 was awarded a four year contract to coordinate and manage STEMNET in NI and the STEM Ambassadors programme. W5's role includes identifying professionals with STEM skills and helping them to become STEM Ambassadors. It can then link these ambassadors with local schools so they can act as role models and help inspire and engage young people about the value of STEM in their daily lives. W5 coordinates the STEM Ambassadors programme throughout NI, ensuring all schools have knowledge of and access to STEM Ambassadors in their area. W5 also aims to help local STEM employers engage with schools in their local community. Various companies have agreed to participate by officially supporting their staff in volunteering activities. These include Northern Ireland Electricity, Bombardier, Thales, Institute of Civil Engineers, Centre of Excellence for Public Health, Equinity ICS, Almac, Schrader, IKEA and Nampak.
- The Ulster Folk and Transport Museum, in partnership with Bombardier, have developed the 'High Flyers Programme'. This utilises apprentices from the company as role models for school pupils and will be developed further throughout 2012.

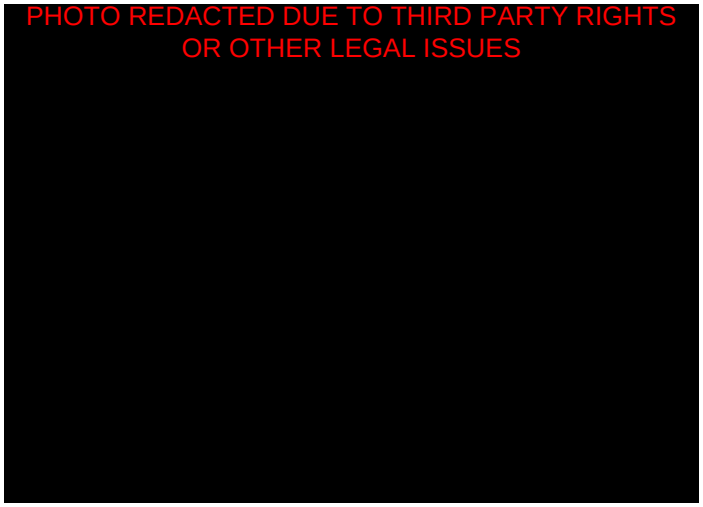
PRIORITY ACTION 2: Managing STEM sector attractiveness

There is a clear need to find ways to engage with parents and young people to highlight the opportunities that are available in STEM throughout NI.

At present there are a number of organisations taking forward STEM sector attractiveness. A key element of the Strategy is the need to link these organisations together.

The following actions have taken place:

- The SBSG has identified the Council for Curriculum, Examinations and Assessment's (CCEA) 'STEMWorks' website as the main STEM portal. As a result, DEL has been working with CCEA and the sub group to improve the links available on the site so that there is more information available to STEM businesses about how to engage with schools, colleges and universities, more information available to young people interested in STEM careers and more awareness of the resources available on the web portal. This portal will be launched to business in the coming months, and is available at www.rewardinglearning.org.uk/STEM/
- The SBSG has been working closely with DETI (via MATRIX), CCEA and C2K (the schools ICT facility) to deliver the exciting STEM Innovation Video Conferencing programme to schools. The programme helps to inspire young people and give them an understanding of the varied opportunities within STEM. Business people with whom young people can identify set a challenge to a number of classes via video conferencing. The classes then undertook projects to develop solutions to the challenges, working closely with mentors from the organisation, through an online environment. Local Business leaders along with MATRIX Panel and STEM Business sub group members will act as 'Dragon's Den' panels in the video conference sessions with the schools during March 2012 to allow the pupils to showcase their work and to receive feedback.
- The SBSG collaborated with W5 to create large careers panels for presentation at the W5 building. The panels, funded by the Department for Culture, Arts and Leisure highlight the different career opportunities in STEM companies including Almac, Tactility Factory, Schrader, Asidua, BE Aerospace, Andor, Learning Pool, Sophia Search and Mash Direct. The aim of these career panels are to inspire students and their parents, and raise awareness of the different career opportunities there are within the STEM industries.
- The SBSG facilitated a workshop with a cross section of employers to discuss gender bias within STEM and produced a paper detailing the challenges which is currently being reviewed by the Government sub group.



Math'a'Magic.

- There is a growing recognition of the value that the Arts can bring to STEM, as well as an appreciation for the artistic elements of these subjects. STEM education must begin early when children's interests and abilities are formed. Research shows that the Arts support the development of skills such as creativity, critical thinking, observation, interpretation and communication, all of which are fundamental in the study of STEM subjects.
- Cahoots NI is a professional children's touring theatre company which receives core funding from the Arts Council of Northern Ireland including support for outreach work to educational venues. Math'a'Magic is just one example of a recent Cahoots NI production delivered, in partnership with the Northern Bank and supported by Arts and Business NI, to primary 7 pupils across the region. Math'a'Magic is a fun, interactive performance where children witnessed magical effects that involved mathematical skills such as estimation and calculation. The production has a number of educational benefits linked to the curriculum at Key Stage 2. The most obvious is mathematics and numeracy with a focus on problem-solving, communicating and reasoning mathematically, an introduction to probability, developing skills in patterns, relationships and sequences in numbers and looking at operations and their applications. It also has links to language and literacy through discussions around mathematical ideas, explaining thinking and presenting outcomes. The medium of Arts is used to explore mathematical issues creatively through the use of drama and personal development and mutual understanding encouraging confidence in a pupil's mathematical abilities.

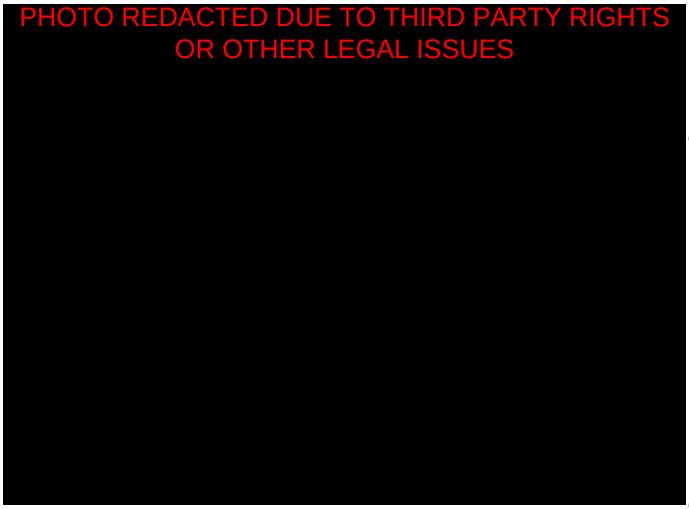
- For a number of years DE has been making strenuous efforts on a number of fronts to encourage young people to study STEM subjects while at school. These efforts are bearing fruit as there has been an upward trend in the number of A-Level STEM entries with 10,702 STEM entries in 2004/05 (36.1% of A-Level entries) rising to 12,659 STEM entries in 2010/11 (40.4% of A-Level entries). However, DE acknowledges that more work remains to be done regarding STEM within school based education and DE will endeavour to drive this work forward within the current public sector budgetary constraints.
- DE's priority is to raise educational standards and reduce educational underachievement. Through continued implementation of 'Every School a Good School: A Policy for School Improvement', DE is ensuring a focus on supporting schools to improve outcomes for all pupils enabling every young person to reach their full potential and make a valuable economic contribution in the future. There has been continued improvement in the percentage of school leavers achieving five or more GCSEs at A*-C including GCSE English and Maths (59% of school leavers achieved at this level in 2009/10).
- In March 2011, DE published 'Count, Read: Succeed – A Strategy to Improve Outcomes in Literacy and Numeracy', which sets out how schools will be supported in raising standards and closing achievement gaps in literacy and numeracy. DE published long term targets to 2020, with milestones to 2015, for improving education outcomes which focus on achievement in numeracy, along with literacy (and ICT). 'Count, Read: Succeed' recognises that good numeracy skills will underpin learning and achievement in the STEM subjects.
- The North/South Education Underachievement Working Group remains focused on work to tackle underachievement in literacy and numeracy. A North/South peer learning event, jointly supported by DE and the Department of Education and Science in Dublin earlier this year brought together representatives from across Europe to explore policies aimed at identifying and tackling underachievement, with a particular focus on literacy, numeracy, ICT and STEM. The event provided delegates with a high level of understanding of the policy and strategy, its implementation and the impact at school level.
- DE, working closely with the Council for the Curriculum, Examinations and Assessment (CCEA), is in the process of rolling-out revised assessment arrangements to support the delivery of the curriculum at Key Stages 1 to 3. From the 2012-13 school year, Communication and Using Mathematics (and from 2013/14 Using ICT) will be assessed with reference to new Levels of Progression, which will focus on skills as well as knowledge.
- DE hopes to consult in spring 2012 on a revised set of reporting regulations, to be introduced in the 2012/13 school year. An important aspect of these regulations will be to ensure that post-primary schools receive relevant information on transferring pupils' progress and achievements so that they can plan teaching in a way that builds on that progress rather than duplicating prior learning which is a concern raised in the 'Report of the STEM Review' in relation to the teaching of science.
- Through DE's Entitlement Framework (EF), young people will have greater opportunity to follow courses, including STEM subjects, that interest and excite them; that are relevant to their futures and to the future needs of our economy; and that can be recognised via qualifications that are credible and valued by employers. DE has reviewed its EF funding formula to focus support for schools in delivering an appropriate range of applied courses, including STEM courses, which will form one third of the schools curricular offer by 2013. All decisions young people make on choices of courses will be supported by high quality careers education, information, advice and guidance in school and with DEL's Careers Advisors.
- Employability, enterprise and entrepreneurship are key themes underpinning the Revised Curriculum which aims to prepare all our young people for all aspects of life and work and to enable them to develop as confident and articulate individuals, able to contribute to growing our economy. It is acknowledged that the delivery of education for employability through discrete timetabled lessons needs to be supplemented with exciting and stimulating whole school programmes, special events including input from outside agencies. DE provides funding to a number of education partners and events which are specifically targeted at providing opportunities for pupils to enhance their interest in, and understanding of, STEM subjects and the potential career opportunities that exist in STEM sectors.

"Promotion of Science, Technology, Engineering and Mathematics (STEM) subjects is very important to our economic growth and prosperity and I acknowledge the critical role school based education plays in engaging pupils from an early age in seeing the relevant and exciting career opportunities open to them through STEM subjects. Despite the difficult budgetary conditions, my Department has made good progress to date in delivering on its commitments contained within the STEM Strategy through both curriculum delivery and teachers continuous professional development."

John O'Dowd MLA

Minister of Education

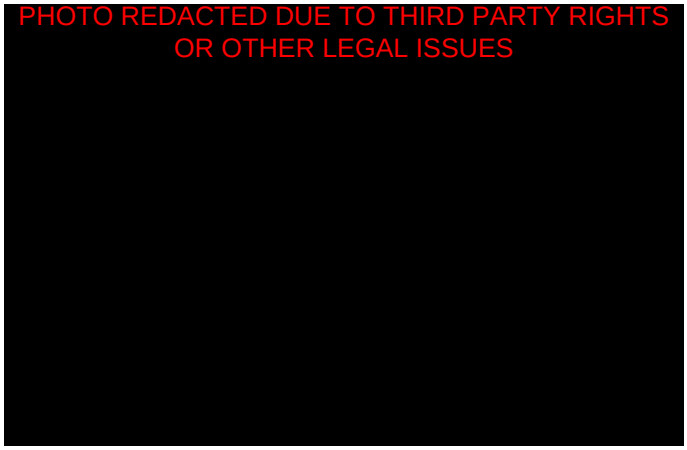
- As the main STEM front line service provider for schools, Sentinus delivers annually a portfolio of innovative and exciting bespoke STEM programmes on behalf of DE to promote engagement in STEM to both primary and post-primary pupils across all Key Stages. In 2010/11 over 58,500 pupils covering 85% of post-primary and 45% of primary schools were engaged in Sentinus programmes. These programmes, including the prestigious annual Sentinus Young Innovators showcase event attended by over 3,000 pupils, play a key role in delivering on DE's commitment contained within the STEM Strategy, 'Success through STEM'.
- The STEM Strategy identified the need for DE to focus its STEM resources on those schools which do not have a strong record of involvement in STEM related activities. DE in conjunction with Sentinus is currently developing a system to capture and map all grant-aided primary and post-primary school STEM enhancement and enrichment activity. This system will allow for concentration of effort in providing advice, support and encouragement to those schools that do not participate, or have a low level of participation in STEM enrichment and enhancement activities.



Pupil from Ballyclare High School who took part in the Nuffield STEM Bursary Scheme in conjunction with Sentinus.

- DE in partnership with Sentinus and the three Initial Teacher Training Institutions (ITTIs), launched a pilot programme 'Smart Gear' during 2011/12. This pilot will involve over 1000 Key Stage 2 pupils from 53 primary schools and 60 training teachers from the three ITTIs. Through engagement in exciting practical activities and extended project work the programme aims to: excite and enthuse young pupils about STEM subjects; provide better understanding of the impact of STEM on all aspects of modern life; demonstrate the relevance and importance of STEM subjects; enhance awareness of industries that require STEM skills; and provide increased awareness of the sort of STEM careers available.
- The Council for the Curriculum, Examinations and Assessment (CCEA) has developed a highly innovative series of web-based resources entitled 'STEM Futures'. Teachers are provided with an engaging mix of enquiry based learning and teaching resources set in the context of future market opportunities identified by MATRIX. The resources are greatly enhanced by animation and video case studies which were supported by a number of leading Northern Ireland companies. 'STEM Futures', which is currently being refreshed aim to enhance classroom practice and encourage pupils in Key Stage 3 to choose to continue to study STEM related subjects at Key Stage 4 and beyond. STEM sector and career profiles are scheduled for publication in March 2012.
- CCEA produced a series of attractive 'STEM Future' posters for classroom display which highlight four key themes which broadly cover the range of work that many STEM based businesses and industries are developing by investing in research, design and creating innovative technologies. The posters are intended to stimulate young people's interest in STEM based subjects and the 'new' types of career opportunities associated with a knowledge based economy.
- CCEA has commenced work on the translation of educational resources for Irish Medium schools to enable delivery of a number of Irish Medium STEM (maths and science) resources for the primary sector.
- DE has tasked CCEA to undertake work to monitor the impact of the new GCSE specifications (particularly English), consider the place of Essential Skills in schools, and provide an assessment of the need for an additional Level 2 qualification that could sit alongside GCSE qualifications in schools here and that includes the development of skills of communication and using mathematics. Guidance has issued to schools outlining the circumstances in which Essential Skills qualifications can be taken in place of GCSEs in English and Mathematics.
- CCEA have revised the GCSE science specifications which were accredited by the qualifications regulators in March 2011 and commenced first teaching in September 2011. A Double Award science specification, where the content is that set out in the science and additional science criteria combined, has been accredited for use in the north of Ireland only.
- CCEA produced STEM CERN web-based videos aimed at Key Stage 3 pupils based on CERN, the European organisation for nuclear research. The main aims of the resource are to stimulate young peoples' interest in science/ STEM and to promote local scientists/ engineers and STEM related careers.

- CCEA have developed case studies within the STEMWorks site to include a focus on the Key Stage 2/ Key Stage 3 interface via collaboration of a number of primary and post-primary schools on a range of innovative connected learning projects which relate STEM topics to the world of work. The resultant case studies (seven of which feature cross-phase collaboration) include videos and teaching notes. Currently, development work is underway which will illustrate how some schools are using this resource. A video case study of schools being innovative in their STEM provision through using ICT has been released.
- In March 2012, CCEA published schools' contributions to a STEM literacy comic entitled 'STEM Heroes'. This project is a follow on to the earlier 'Norn Iron Ordinary Heroes' and has been developed to encourage young people to develop their thinking skills, particularly their managing information skills to research a STEM Hero in their local community and then use ICT to present or publish this in whatever form they wish.
- CCEA have produced 'Promoting STEM in the Primary School (KS2)' case studies and STEM thematic units for primary schools. These resources will encourage schools to develop connections between science, technology, engineering and mathematics at Key Stage 2 by producing guidance through case studies of STEM teaching and learning and improve teachers' and pupils' understanding of the connections between school-based learning and the STEM 'world of work'.
- CCEA have developed a STEM Directory which provides teachers and other key stakeholders with easily accessible information about local business/ industries and other educational bodies/ organisations which support STEM education and will contribute to promoting a more co-ordinated approach to developing STEM initiatives/ education.
- CCEA have produced guidance which has been published in March 2012 to support teachers in the area of Learning for Life and Work to develop pupils' skill in Using ICT. These materials will promote the use of new and emerging technologies and are designed to increase interest in the IT sector.
- As part of its efforts to promote STEM and to make STEM related subjects more interesting and exciting to young people, DE, via funding provided by DETI through the Innovation Fund, commissioned the North Eastern Education & Library Board to procure a "STEM Truck", a new state of the art facility which is the first of its kind on these islands. The 58 square metre truck is a mobile laboratory and workshop and provides an interactive workspace with interchangeable teaching resources, allowing it to transform from a biology laboratory one day into an engineering workshop the next. During the period January 2010 to February 2012 over 23,000 young people and 3,800 teachers have visited and experienced leading edge technology available in the STEM Truck. Through revised access criteria, priority is being given to primary schools and those schools serving areas of significant social disadvantage.



The 58 square metre state of the art 'STEM Truck' which provides interactive workspace with interchangeable teaching resources.

"If we are to compete successfully in global markets, we need to see many more of our young people enthused and engaged in studying science technology, engineering and mathematics. These STEM subjects need also to be infused with a business and entrepreneurial spirit. That is why I am heartened to see, my Department and MATRIX through initiatives such as STEMWorks, helping our businesses to work with our young people and teachers to set STEM subjects in the context of a modern economy.".

Arlene Foster MLA

Minister of Enterprise, Trade and Investment

- DE organises / provides financial support for a number of STEM events annually in order to inspire and enlighten young people of the STEM opportunities that exist and enable them to see the link between their studies and the STEM world of work. These events include:
  - The prestigious BT Young Scientist Exhibition which provides the motivation and stimulus to encourage today's students to strive to be at the forefront of research and innovation in tomorrow's world and encourage our young people to be interested in science and technology which is vitally important to our economy;

BT Young Scientist award winners from St Mary's College, Derry with Education Minister, John O'Dowd and Peter Morris from BT.

  - Stock Market Challenge competition, in collaboration with Invest NI and supported by a number of financial sector partners; AXA, Citi, First Derivatives, HML, NYSE Euronext, Santander and Singularity, forges a pathway for young people from Year 11 through to undergraduate, offering them a context for applying subject knowledge in subjects such as computer science and mathematics. During the competition, short presentations from the business sector companies enable accompanying teachers to hear first hand of the potential STEM career paths and opportunities available within the financial services sector;
  - DE provided part funding for a new 'Step N Zones' event delivered by Invest NI as part of Global Entrepreneurship Week which attracted over 900 pupils from 34 schools during the two day event aimed at developing business ideas, challenging pupils creativity and flair and ability to develop innovative ideas, including STEM;
  - Science Olympiads - each year local Science Olympiads competitions are held for Biology, Chemistry, Informatics and Physics and are open to pupils from across the north of Ireland. The two winners in each subject join with two pupils from the south to form an Ireland team and compete with over thirty other countries in the International Science Olympiads. Medal winners at this international event can lead to scholarships being awarded by prestigious universities abroad eg Harvard;

Pupils from Rathmore Grammar School who won the 2011 Stock Market Challenge (Belfast Region) event.

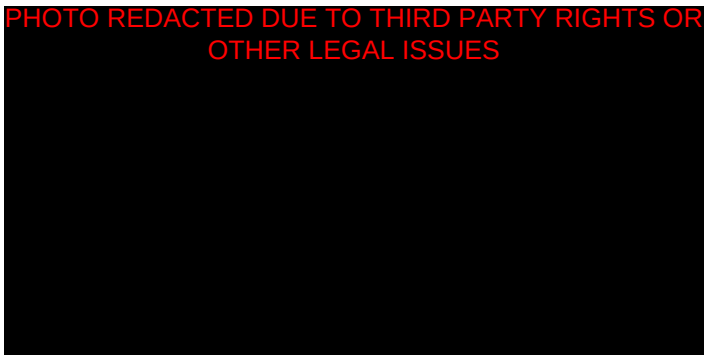
- DE is currently working with Young Enterprise NI (YENI) to develop an Irish version of its successful Primary Programme currently delivered in English medium schools. It is proposed to include these Irish programmes in YENI's offering to the primary sector commencing April 2012. These bespoke programmes reflect the needs of the local community whereby job roles highlight the importance of STEM based careers.
- DE and DEL are continuing with implementation of the Careers Strategy 'Preparing for Success' which will work to secure the provision of high quality, careers education, information, advice and guidance (CEIAG) and which includes a focus on promoting STEM career opportunities. A progress report on the Preparing for Success Implementation Plan was launched at a joint DE/DEL careers conference in June 2011. The aim of the conference was to raise awareness of the importance of effective CEAIG in the current economic climate and its potential impact on the life chances of young people, and to demonstrate the different routes to a successful career in the modern world and set these in the context of the future needs of our local economy.

- A joint Education & Library Board (ELB) STEM CEAIG Group continues to work to promote and raise pupils' awareness and aspirations in STEM-related careers through focused projects, activities and resources, capacity development and embedding STEM CEIAG within the school curriculum.
- DE currently funds 12 Business Education Partnerships (BEPs), which are voluntary organisations made up of staff from local schools, local employers and members of the business and wider community, to deliver exciting business education activities, aligned to the revised curriculum. These activities include STEM activity days, STEM careers events, new and emerging STEM careers workshops and a Women into Science and Engineering programme.
- The STEM Centre is a specially designed state-of-the-art teaching facility which is focused exclusively on delivering educational and interactive activities in STEM areas. The STEM Centre is designed to bring a 'wow' factor to STEM education and generate impactful learning experiences through hi-tech interaction and collaboration. Activities within the Centre are offered to school pupils (Key Stage 3 and 4) and college students. Located in South West College's Dungannon Campus, the 350 square metre facility is the only dedicated, purpose-built STEM Centre of its kind in the UK and Ireland. Since the programme commenced, 2850 pupils from some 30 schools have participated on a range of relevant and motivational STEM activities in the college.

The STEM Centre, South West College

- The STEM Centre is designed to capture and attract the imagination of young people and promote interest in the vast range of career paths and options available. Feedback from participants indicates that 96% are more likely to select STEM subjects for further study following a visit to the STEM Centre. The Centre also actively targets the Special Educational Needs sector and has organised a dedicated workshop with teachers from a local school to investigate how the Centre could be used to best effect to support the work of the sector.
- The South West College has achieved three 'Beacon Awards'. The aim of the awards is to highlight the breadth and quality of education in colleges, throughout the UK, and to increase understanding of colleges' contribution to UK educational skills policy and economic and social development. They are administered on a UK-wide basis by the Association of Colleges' Charitable Trust. The college's Business Development Unit has been awarded the 2011/12 Beacon Award for College Engagement with Employers, using the bespoke training, research and development (R&D), and innovation support in design, renewable technologies and electronics, delivered through the college's InnoTech centre, as an exemplar in support of their application.
- The college's Curriculum and Technology Team has been awarded the 2011/12 Beacon Award for College/School partnerships, for its development of effective school relationships to promote greater understanding of STEM subjects (Science, Technology, Engineering and Mathematics), again, developed and designed through the college's InnoTech Centre. In addition, the college's STEM project has also been awarded the beacon President's Award from Lord Willis of Knaresborough, President of the AoC Charitable Trust.

- STEM continues to prosper within North West Regional College and investment within the past year has led to the opening of the college's new 135 seat modern theatre complete with state of the art music recording and technology facilities. Specialist workshops and project rooms for construction and engineering, allied to new ICT labs, further contribute to the student experience and the links with business. The college has also played its part in the new Peace Bridge with two of its HNC students in Civil Engineering now employed by Graham Construction as site engineers on the project. One of these students was also awarded the Quest scholarship by the Institution of Civil Engineers.



- The Careers Advisory Service of DEL has been continuing to raise awareness of STEM opportunities through various presentations in schools on labour market information and through one to one interviews with pupils.
- DEL continues to fund the University of Ulster 'Step Up' programme. This programme encourages pupils from secondary schools in disadvantaged areas of the North West and Belfast to study science at university. The programme has been running successfully for ten years and actively involves the university, schools, local industry, local hospitals and government agencies.
- Invest NI, in conjunction with e-skills, is funding a further run of the 'BringITOn' marketing campaign, aimed at encouraging young people to consider a career in the ICT industry. This is part of an ICT Action Plan being taken forward by Government and industry to address the particular skills issues faced by the ICT sector.
- As part of the Future Skills Action Plan for Food and Drink, Manufacturing and Processing, Improve the Sector Skills Council for Food and Drink, developed the 'Tasty Careers' programme to show young people the variety and high quality careers that are available across the food and drink manufacturing and processing sector. Run in collaboration with CAFRE, the programme includes a bright, appealing booklet detailing a number of case studies from young people within the industry, some of whom also act as Ambassadors. The Ambassadors visit post-primary schools to educate young people about the industry and to encourage young talent, including those studying STEM subjects, to consider a career path within the sector.

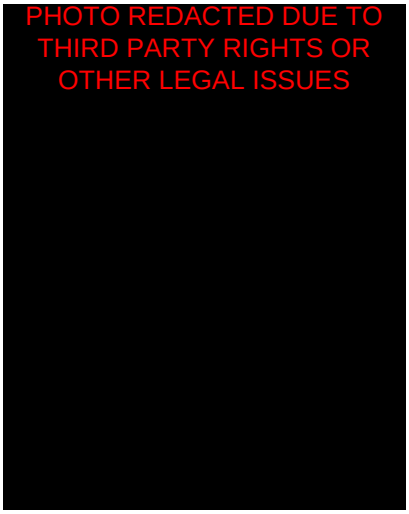
  Throughout the year, various events were organised by the College of Agriculture, Food and Rural Enterprise (CAFRE) to promote education programmes and careers in the agriculture, horticulture, equine and food industries. These events were held both at CAFRE campuses and in the schools themselves and involved more than four thousand young people.

"I very much welcome the opportunity for my Department to be involved in co-ordinating and delivering the STEM Strategy. My Department contributes to the supply of STEM qualified people through the provision of education and training for the land-based, food and rural sectors. The College of Agriculture, Food and Rural Enterprise (CAFRE), based at three main locations across the north, aims to develop the competences and values of people entering and working in the agri-food industry. Each year, CAFRE delivers at least 1,600 people entering employment or working within the agri-food sector achieving a new qualification at NVQ Level 2 or above. My Department also has a range of up-skilling and lifelong learning actions to assist continued professional development of individuals and businesses within the land-based, food and rural sectors. It is vitally important that 'Success through STEM' continues to provide a focus and strategic framework to ensure we have appropriately skilled people within the agri-food industry to allow it to compete in the global marketplace."

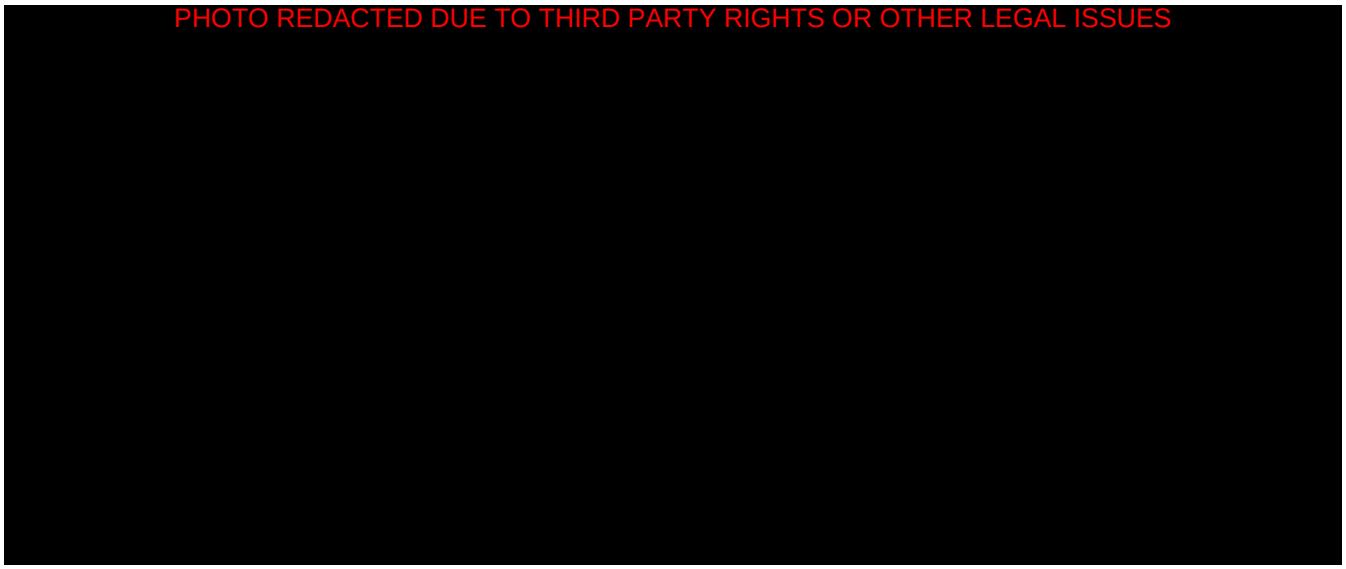
Michelle O'Neill MLA

Minister of Agriculture and Rural Development

- CAFRE has delivered careers teachers conventions providing opportunities to update school career and science teachers regarding the courses and career opportunities available within the agri-food industry.
- CAFRE has also provided curriculum/syllabus support through the provision of workshops on Microbiology, Chemistry, Biology and Environmental or Land-based science aimed at GCSE and A level students and those studying First Certificates in Agriculture, Horticulture and Occupational Studies.
- Astronomers at the Armagh Observatory and archaeologists from the NI Environment Agency (NIEA) hosted a day of free BBC Stargazing LIVE and Universe Awareness (UNAWE) activities at An Creagán and the nearby Beaghmore Stone Circles, County Tyrone. Other partners in the event were Cookstown and Omagh District Councils. Beaghmore is a unique megalithic site in Europe and the best 'Dark-Sky' site in NI. The event was part of the BBC's series of "Stargazing LIVE" activities in January 2012 as well as supporting the Armagh Observatory's programme of Science in the Community and the Observatory's participation in EU-UNAWE. This is an international astronomy outreach programme which uses the beauty and grandeur of the universe to inspire young children and encourage them to develop an interest in science and technology.
- In association with the Marble Arch Caves Geopark and the Irish Astronomical Association, the Armagh Planetarium participated in 'Cosmic Cuilcagh'. This was intended to inspire people about our place and beyond and was a seven day event with Stardome and meteorite presentations and electricity and magnetism workshops.
- In December 2011 the Armagh Planetarium organised a Christmas card competition to enthuse children about space. The theme of the competition was 'Christmas in Space'. Over 700 entries were received and all participating schools received an outreach visit from the Planetarium.
- In January 2012 in association with Lagan College Belfast, Grahams Construction and the National Trust the Armagh Planetarium provided a 'Super Saturday' of events. Over 400 people turned up for the event which brought building, nature and the stars together.
- Libraries and local museums across Northern Ireland contain a rich source of books, exhibits and knowledge on STEM and science related themes. These help to inspire interest and further self-study. In March 2011 the Armagh Planetarium portable Stardome visited Enniskillen library to guide library users through an innovative tour of the night sky.
- W5's mission is to 'fire the spirit of discovery by unlocking the creativity and scientist in everyone'. Managing the attractiveness of STEM and links with art and creativity are central to the organisation. During 2011 over 200,000 visitors engaged in STEM activities at W5, over 32,000 pupils visited W5 as part of a formal education visit and over 36,000 users participated in STEM events and activities as part of W5's outreach programme.
- To celebrate National Year of Pathology in 2012, W5 is working with the Royal College of Pathologists to develop and deliver a range of programmes to provide a unique insight into the wide range of medical and healthcare careers available. From offering finding out what is involved in an autopsy or post-mortem examination, to understanding the range of professionals involved in 'Building a healthy baby'.
- W5 has collaborated with the British Council to develop and deliver an educational programme exploring climate change and sustainable development linking schools from Northern Ireland, Republic of Ireland and Ghana.
- W5 have worked with Queens University, University of Ulster, Northern Ireland Electricity and SAP to develop and deliver Northern Ireland's first Lego league competition, which linked 11 businesses with 19 post primary schools from across Northern Ireland.
- The Ulster Museum has held several natural history events including a series of programmes for schools and those contemplating a career in conversation with BBC's Nick Baker. Nick is a naturalist, author and presenter of television's The Really Wild Show, CBBC's Springwatch, Weird Creatures and Beautiful Freaks. Touch and Talk events for general audiences to engage with science collections and talk with curatorial and learning staff have also taken place over the past twelve months.



- In partnership with the Northern Ireland Environment Agency, the Ulster Museum delivered a marine biology and conservation event programme. This included information for those contemplating marine biology as a career. The programme was delivered as part of National Science and Engineering week.
- To coincide with Creativity Month and the 10th anniversary of W5 in March 2012, the 'Science of Titanic' workshop took place. The workshop was based on key scientific principles linked to the Titanic exhibition at the Ulster Folk and Transport Museum.
- As part of National Science and Engineering week in March 2012 the 'Undersea World' programme was delivered. This was a marine biology and conservation event programme at the Ulster Museum and delivered in partnership with the Northern Ireland Environment Agency. The programme included information for those contemplating marine biology as a career.
- Throughout 2011 partnerships have been strengthened between the Ulster Museum, the Royal Society for the Protection of Birds (RSPB) and the Northern Ireland Bat Society. This has included the BBC natural history programme 'Live N Deadly' event to facilitate connections with popular television science.
- The National Museums Northern Ireland learning programme has delivered a range of STEM related curriculum programmes and workshops for schools on topics such as 'Rainforest', 'Invertebrates', 'Dinosaurs', 'Maths Trails', 'Track it Down', 'Living Lightly – lessons from history' and 'Maths Across the Oceans'.
- The Northern Ireland Space Office, Armagh Planetarium, European Southern Observatory and UK Space Agency have collaborated to create the 'Cosmic Explorers' and 'Space for All' programmes. These are designed to engage schools and family audiences with learning about space, the Hubble Telescope and astronomy.
- The Armagh Observatory has engaged with the local community and Armagh City and District Council to facilitate the installation of public art exhibits in the city with a scientific or astronomical theme. The first of these, "Celestial Sphere", was installed at the end of 2010; a second piece "Turning Point" was installed on the Mall in March 2012.
- The Observatory's historic 6-inch reflector by Thomas Short, used by King George III to observe the 1769 Transit of Venus, will be on loan to the National Maritime Museum for much of 2012, where it will form part of the "Royal River" exhibition, to be opened as part of the Queen's Jubilee. A public lecture "Measuring the Solar System: The Eighteenth Century Transits of Venus" will form part of the Observatory's annual St Patrick's Day events in 2012.
- The Observatory runs a vibrant active programme of school work-experience student training. This develops and maintains young people's interest in science in the last two years of secondary school, and provides them with a valuable experience of working in a scientific research institute before they apply for third-level university courses.
- In May 2011, the Armagh Observatory worked with the centre for Cross Border Studies to host the third cross-border Schools Science Conference. Approximately 250 key stage 3 pupils attend the two-day course, which focused on the theme of students from all sides of the community discovering the Universe together through team-working in astronomy and related sciences.



PRIORITY ACTION 3: Facilitating STEM Continuous Professional Development

Continuous Professional Development (CPD) is essential to help teachers and lecturers in schools, colleges and universities to better contextualise their subjects. It also can have a significant influence on initial careers thinking of students.

- As part of the wider work to reorganise support for teachers and schools, DE provided additional STEM funding to the five Education and Library Boards (ELBs) to enable them to deliver STEM projects/ initiatives with the key aims of:-
  - Providing professional development to primary and post primary teachers to support STEM teaching and disseminating best practice (including a focus on improving teaching and learning – and pupil attainment – in STEM subject areas); and
  - Ensuring the provision of professional development opportunities for teachers that are designed to promote and support effective STEM teaching in the primary and post-primary sectors within the revised curriculum (and to disseminate best practice).
- The funding provided by DE to the ELBs has been used to deliver a range of CPD projects [courses and events] to improve the skills and knowledge of teachers in STEM subjects, leading to higher engagement and motivation in STEM activities. It is estimated that in total, approximately 1,000 teachers have participated in and benefited from these initiatives which include:
  - Development of a range of on-line support packages which exemplify positive practice in the teaching of STEM subjects followed by the delivery of a 'Sharing of Positive Practice' STEM conference;
  - Provision of a range of science professional development courses in partnership with the National Science Learning Centre (NSLC);
  - Provision of targeted courses in technology to update teachers knowledge and skills in the areas of CAD/CAM and graphic communication;
  - Provision of a range of 'Teacher Support' courses to update teachers skills in the delivery of the science curriculum (including the use of IT and data logging in the delivery of science teaching);
  - Training Teacher Developers to facilitate improved learning and teaching in Primary Science and the World Around Us learning, by engaging with and providing CPD support to teachers across clusters of schools;
  - The Royal Society for Chemistry and the Institute of Physics delivered training to up-skill post-primary non-science specialist teachers to enable them to teach Chemistry and Physics to GCSE level;
  - Providing teachers of Technology with opportunities to develop resources in teaching and application of PIC in Technology and Design;
  - Providing teachers of Technology and Science with opportunities to develop high quality teaching resources and project work and in doing so increase their confidence and competence in using metal and provide quality experiences in teaching metal in an interesting and relevant way in both Science and Technology;
  - Enabling greater numbers of STEM subject teachers to participate in a range of relevant CEIAG and STEM activities by facilitating the attendance of approximately 300 STEM teachers and careers colleagues at specialist interactive conferences and industrial visits;
  - The delivery of modules of the City & Guilds 6131 course to facilitate the up-skilling of Technology and Design teachers to meet required health and safety standards;

    building on the professional capacity of STEM teaching staff by developing and promoting the sharing of effective practice at Key Stages 3 and 4 (through collaboration between a minimum of 2 STEM areas of learning within individual schools or collaboration between schools in an Area Learning Community (ALC) in an identified STEM subject);
  - Providing funding to two Primary Schools to facilitate their participation in the Primary Science Quality Mark initiative, thus raising the profile of primary science;
- As part of the ELB STEM Careers Education, Advice, Information and Guidance (CEAIG) project, group members provide ongoing support to teachers in the ALCs to identify and share good practice both within their own school and with other schools, including supporting delivery of STEM CEIAG events for Year 10 pupils. These ranged from Interactive STEM Careers events delivered in conjunction with FE Colleges to pupils experiencing a theatre production aimed at raising their awareness of STEM opportunities.

- In June 2011, the ELB STEM CEIAG Group launched 'go4stemni.org', a website for teachers to share good practice and which contains learning and teaching resources, resources developed from teacher placements, resources and activities used at Engineering Conferences, ideas on how teachers can raise awareness of STEM careers, and provide easy access to a range of publications and links to a wide variety of STEM and CEIAG organisations and resources.
- A STEM CEIAG toolkit was developed by the ELB STEM CEIAG Group and issued to each post-primary school which included example lessons and video resources for teachers. A 'What is Stem' brochure has also been produced and distributed to all schools to inform Year 10 pupils and their parents of possible STEM careers and how manufacturing and knowledge based industries involving the STEM subjects will play an important role in developing the economy here. In addition, a 'Why STEM Matters' DVD has been produced in conjunction with NEELB TV which will enable schools to up-skill their STEM teachers, CEIAG teachers, Senior Leadership Teams and Boards of Governors in regard to Labour Market Information. The DVD also includes sections which can be used in the classroom or at option events for parent and pupils.
- The ELB STEM CEIAG group, in conjunction with the Learning & Skills Development Agency (LSDA), delivered a series of 'Engineers Make It Happen' events attended by 96 teachers. These events comprised of visits to local businesses and are designed to up-skill teachers in terms of the wide range of engineering careers here and the possible pathways which would allow young people to access these careers.
- Through the ELB STEM CEIAG Group, 58 teachers attended a STEM Placement Programme which focused on the development of STEM CEIAG learning and teaching resources for use back in the classroom.
- The Institute of Physics (IOP), with financial support from DE, has appointed three teacher network co-ordinators with a brief to support the teaching of physics in schools across the north of Ireland up to March 2013. They form part of a UK and Ireland wide network of 35 co-ordinators. To date work undertaken has included:
  - Making links between primary and secondary schools and colleges and working with organisations such as Sentinus, the NI Science Park, the Association for Science Education and the Education & Library Boards;
  - Developing training sessions for non physics specialist teachers;
  - Distribution and advice on key teaching and careers materials; and
  - Workshops and training events for teachers and students.
- CCEA delivered Teacher Insight STEM visit programmes for 50 teachers. The teachers visited the new Public Records Office in the Titanic Quarter in Belfast. The visit provided teachers with an overview of the construction and removal to the new premises as well as an insight into the restoration and treatment of the documents stored there. From a technological perspective they were able to find out about the latest technological aids used in storing and archiving these valuable records.

Head of Conservation Irene Hutton (left) shows teachers Clare Foster (Aquinas Grammar School), Tony Keeley (St Malachy's High School) and Dr Henry Jefferies (Thornhill College) the importance of protecting and repairing historic documents as part of CCEA's Teacher STEM Insight programme.

- DE provided funding to Momentum for the provision of a training event for teachers of ICT and computing at 'A' Level. The funding was specifically to support the provision of a bursary to the relevant grant-aided schools in respect of those teachers attending the training event. 73 teachers attended the one day training events which comprised presentations from industry representatives and leaders detailing information on recent technology trends, the types of environment and working practices used in ICT companies here and the types of roles and skills required in the ICT industry. In addition, training was provided by Microsoft Ireland staff in the latest programming techniques and available support packages.
- DE funds a STEM bursary programme run by General Teaching Council NI which aims to help individual teachers to plan and organise professional development activities to address identified needs in STEM subjects. 38 teachers participated in the STEM bursary programme which places strong emphasis on teaching and learning in the context of the revised curriculum.

- Sentinus, on behalf of DE, are undertaking the delivery of the Smart Gear pilot programme. Through collaboration with the three ITTIs, training teachers, as part of their formal 'teaching practice' will undertake the delivery of the 'Smart Gear' programme which will support the development of their pedagogic skills; support their Early Professional Development; demonstrate to training teachers the value of engaging primary pupils in STEM subjects; develop the science skills of non-science specialist training teachers; illustrate the importance of STEM subjects as a mechanism for delivering the 'World Around Us' within the Key Stage 2 curriculum; strengthen relationships between teacher training institutions and schools; and encourage knowledge transfer between training and qualified teachers. The class teachers in the 53 pilot schools will also benefit from delivery of the programme through: providing support for non-science specialist teachers at Key Stage 2; provide opportunities for the development of activities to support the delivery of the 'World Around Us' within the Key Stage 2 curriculum; support Continuous Professional Development (CPD); demonstrate the importance of STEM subjects in the curriculum; and focus on schools from rural or inner-city schools with low levels of previous STEM engagement.
- When compared to 2005/06, there was an increase in 2010/11 of over 5% in teacher graduates with STEM related subjects. In relation to the physical sciences, particularly Chemistry and Physics, there has been an increase in graduates of over 18%. There are currently a combined total of 95 students enrolled at Stranmillis and St Mary's on their BEd post-primary mathematics/ science courses and recruitment to these courses has increased by 200% since 2007/08, with an annual combined projected output of around 20 graduates each year.
- In recognition of the Quality Improvement agenda of DEL, and to ensure that a high quality learning experience is provided for all students, the Department has facilitated the creation of a fund to support the development, facilitation and administration of an industry standard up skilling project with an emphasis on STEM subjects for Further Education lecturers. This project aims to ensure that lecturers working across a wide range of vocational areas have the opportunity to update their experience and skills in a specific field, thus creating the opportunity to embed new ideas within colleges. The scheme facilitates engagement with each college and identifies opportunities for it to enhance the experience of its staff and to foster the development of curriculum and other processes and services. The initiative also seeks to identify placements and project opportunities for staff from other organisations to work closely with colleges.
- CAFRE Development Service continues to deliver Knowledge and Technology Transfer and industry training programmes to 10,000 participants within the agri-food sector on an annual basis. The programmes range from half day bespoke training to 10 days accredited at Level 3.
- Under the Skills Training Element of the NI Rural Development Programme 2007-2013, DARD is providing a range of innovative and focused training and information actions to 3120 people. These actions are aimed at improving the competitiveness of farm and horticulture businesses in NI. In 2011/12, 74 farm family members applied for a range of ICT courses. Currently, a bespoke ICT training course specifically addressing farmers' needs is under development and will be open to applications later in the year.
- DARD awards eight postgraduate agricultural and food studentships each year to enable students to undertake research projects which meet the objectives in DARD's priority research areas (aligned to DARD's Evidence and Innovation Strategy). Currently there are 22 DARD-funded postgraduate students and the financial support for each three year studentship is £19k per year. Students develop a range of skills which enhance their employment and career prospects, in addition to contributing research of benefit to our agri-food industry and rural economy. Research findings are disseminated to DARD staff and stakeholders at an annual post-graduate seminar, in addition to publication of papers and presentations at International conferences.
- DARD has collated an evidence base identifying the future demand for, and returns from, education, skills and lifelong learning within our land-based businesses and the food and rural sectors. Collectively, this evidence base and the lessons emerging from it will be available to inform and shape the Department's approach to future education and training initiatives. The information will be available to help shape the next NI Rural Development Programme 2014-2020, as well as the new Agri-Food Strategy.
- CCEA, in partnership with DETI and MATRIX, has developed innovative online resources to help teachers to enrich science lessons at Key Stage 3 through the provision of examples sourced from local industry. The website, which includes teaching enquiry based learning and teaching resources including video and animation, is designed to set STEM learning in an economic context with case studies and resources provided by local companies. The website can be accessed at http://www.rewardinglearning.org.uk/STEM/.

- The Arts Council and Creative & Cultural Skills jointly hosted two seminars in 2011, 'Growing the Creative Economy' which had a mixed audience comprising representatives from government, education and the creative industries. In these seminars, best practice was shared in addition to discussion of where improvements could be moved with the purpose of growing the creative economy. The actions included professional doctorates in creative industry areas; increased funding for arts-based research projects as limited funding is currently available; provision of graduate skills training and skills acquisition; the need for CPD updating creative skills; need to build infrastructure to develop skills; need for incentives to enable artists / craftspeople/ designers back into education; and the need to plough more resources into research and development to sharpen creative edge.
- The Armagh Observatory's new EU-funded Universe Awareness (EU-UNAWE) programme has, in the last six months, trained more than 80 primary school teachers in astronomy. In turn, these teachers have the potential to reach many thousands of primary-sector school pupils. This programme is proving to be a very effective way to improve the quality and range of science teaching in Northern Ireland primary schools, with a special focus on the World Around Us part of the curriculum.• To facilitate continuous professional development the Armagh Planetarium have held teacher training and adult education courses, in conjunction with Queens University in Belfast and colleagues in the Republic based in Dublin and Cork. The Planetarium also offer video conference sessions to schools and have run a number of these with schools here and in the USA. They maintain an active web presence and promote the STEM agenda with lively discussions, provoked by articles written and published by staff.
- There are three Creative Learning Centres in Northern Ireland. These are the Amma Centre (Armagh), The Nerve Centre (Londonderry) and Studio On (Belfast). They provide training, workshops and creative experiences for teachers, students, community leaders and young people. Every year they work with over 300 schools, over 1800 teachers and over 5000 young people. The Creative Learning Centres offer a wide ranging Teacher Professional Development programme to support and enhance each teacher's own understanding and development of digital literacy.
- Each year the three Creative Learning Centres combine to offer a week long theory and practical based training week for Moving Image Arts teachers. Over the course of the event the teachers can pick from theory based workshops, such as script writing through to practical workshops in editing, lighting or creating special effects. During 2011/12 over 150 teachers attended the event.

"Creative and inspirational learning experiences are crucial to promoting STEM. The knowledge, exhibits and programmes provided by W5 and our museums, libraries, Observatory and Planetarium provide STEM experiences that add value to teachers, students and lifelong learners. Arts and culture plays a key role in telling STEM stories to inspire young and old alike."

Carál Ní Chuilín MLA

Minister of Culture, Arts and Leisure

- W5 has developed and delivers an Early Years workshop for teachers and childcare specialists. W5 also works with the National Science Learning Centre and Research Councils to develop and deliver topical STEM CPD for teachers. CPD sessions were also conducted for teachers and mentors with regard to Lego Mindstorms in preparation for First Lego League. W5 works with Stranmillis University College to deliver an elective STEM Module, 'Learning outside the Classroom'.
- Geology, palaeontology and zoology curators delivered a series of lectures in the Ulster Museum to general audiences, formal learning groups, clubs and societies. This include general interest lectures on their subject areas and information about their research. The objective is to make audiences more aware that the Ulster Museum is also about active scientific research as well as collections.
- The Ulster American Folk Park facilitates annual visits from student teachers from Stranmillis College who undertake the 'Maths Trail' on site as part of their training.