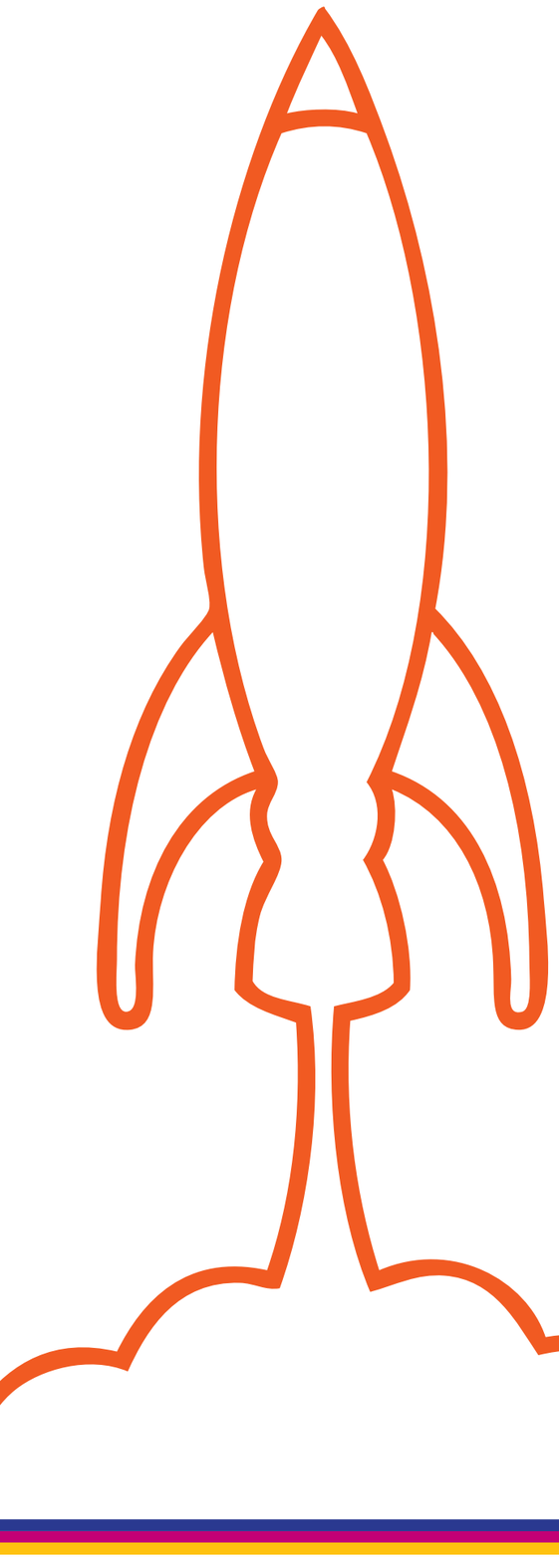
# STEM Careers Awareness Stakeholder Guide



# Contents

# 1. The Purpose of this Document

This document aims to provide an overview of the activities currently being undertaken by the Department for Children, Schools and Families (DCSF) and its partners to encourage greater interest in and take-up of Science, Technology, Engineering and Maths (STEM) careers by young people. It sets out the context for the work already underway, highlights the achievements to date and looks forward to what we can expect from continued activity in 2009 and beyond. It also includes key messages for all stakeholders and advice for how best they can get involved.

The document has been produced for all organisations that have an interest in careers awareness and especially in STEM careers awareness and promotion. This includes professional careers bodies, science/technology/mathematics/engineering public engagement associations, companies requiring a steady supply of STEM graduates and business/trade bodies and associations.

The information in this brochure has been provided by those organisations currently delivering on the various strands that form the STEM careers awareness activity, as set out in the STEM Framework document developed by John Holman, the National STEM Director. These organisations include the DCSF, the Science Council, the Centre for Science Education at Sheffield Hallam University and the Centre for Education & Industry at the University of Warwick.

We hope that reading this brochure will ensure all STEM stakeholders:

- Understand what the Government is doing and why
- Understand how they can get involved
- Understand what they should do next and where to get more information

# 2. STEM Context

The UK is in a hugely enviable position from a global economic perspective. We are a world leader in research and development, especially in areas including clean technology, biotechnology and pharmaceuticals.

At the moment though, we simply don't have enough young people choosing science-related subjects to maintain a ready supply of skilled scientists to capitalise on our world-leading position in the mid to long term. Research from the CBI has flagged this potential shortage as a serious issue for UK plc, citing that the UK needs to double the number of new science graduates over seven years, or see skilled jobs disappear.

## 10 Year Framework for Science & Innovation

The Government launched the 'Ten Year Science and Innovation Framework in 2004' to help address this problem. In this, it made investment a priority and emphasised its commitment to improved attainment in science, especially at GCSE, increased uptake of science and mathematics posts-16 and improved science and mathematics teaching. This therefore set a number of challenges for the education system and STEM to meet.

## The STEM Report & Framework

In response to these challenges, DCSF produced the STEM Programme report which recognised the need for greater collaboration between organisations with similar aspirations for STEM education in the UK, around the following key themes:

- Attract and retain the right teachers and lecturers in STEM subjects
- Provide the right continuing professional development (CPD) for teachers of STEM subjects
- Provide the right activities and careers advice that bring real world contexts and applications of STEM into the classroom
- Get the STEM curriculum in the classroom right
- Get the STEM education support infrastructure right

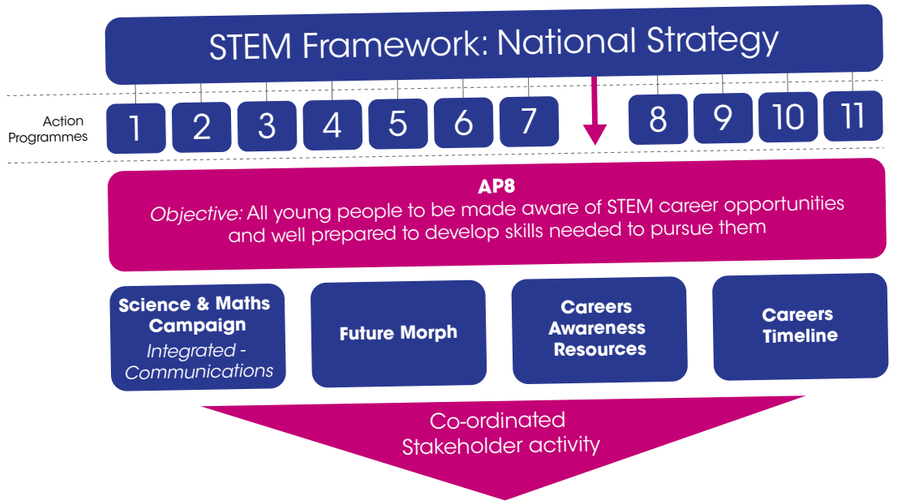
# 3. Delivering success

The National STEM Director, Prof John Holman, was tasked with developing the national strategy to implement this, which he laid out in the STEM Framework published in May 2008. The framework includes 11 action programmes within which STEM partner organisations can work:

- AP1 Improving the recruitment of teachers and lecturers in shortage subjects
- AP2 Improving teaching and learning through CPD for mathematics teachers
- AP3 Improving teaching and learning through CPD for science teachers
- AP4 Improving teaching and learning by engaging teachers with engineering and technology
- AP 5 Enhancing and enriching the science curriculum
- AP6 Enhancing and enriching the teaching of engineering and technology across the curriculum
- AP7 Enhancing and enriching the teaching of mathematics
- AP8 Improving the quality of advice and guidance for students (and their teachers and parents) about STEM careers, to inform subject choice
- AP9 Widening access to the formal science and mathematics curriculum for all students
- AP10 Improving the quality of practical work in science
- AP11 Building capacity of the national, regional and local infrastructure

These programmes are now being rolled out with the support of various organisations across the UK and under the direction of the National STEM Director.

The information in this brochure relates to Action Programme 8. Within this programme a range of initiatives have been brought together under one campaign, as illustrated below:

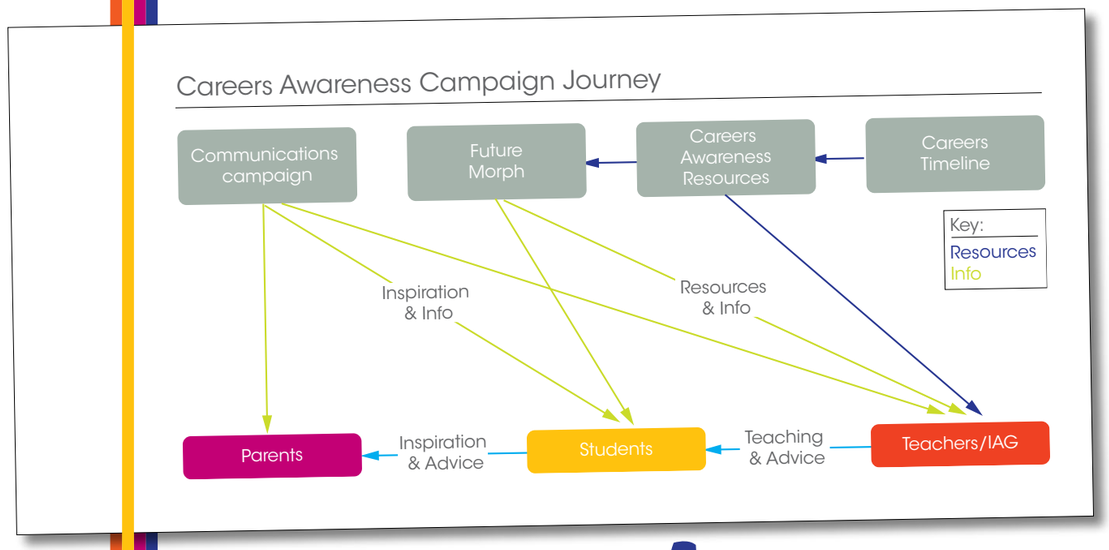



The National STEM Careers Co-ordinator has the role of bringing these four initiatives together to ensure they deliver on their shared objectives:

- All young people to be made aware of the fulfilling and attractive careers open to them through continued study of science and maths
- That they are well prepared to develop the necessary skills and qualities needed to make informed choices about the qualifications they will require for further study and careers in STEM

Although specific partners have been commissioned to deliver the core work, the long-term success of each initiative relies on the effective collaboration and co-ordination of a range of organisations, skills, resources and content. Together with the Stakeholder Advisory Group, the National STEM Careers Co-ordinator, will work with stakeholders to do this as effectively as possible.

This brochure should be seen as an introduction to the campaign for stakeholders. The subsequent pages provide further information on the initiatives underway and how you can get involved.




# 4. An Integrated Approach

## *Science and Maths integrated communications campaign*

Launched in March 2008, the DCSF's three-year communications campaign is designed to engage young people (aged 11-16 years), their parents, the workforce and relevant stakeholders to improve the take up of science and maths subjects, post 16.

The campaign's central strapline is 'see where they can take you'. Its strategy is to inspire young people to take science and maths post 16 by showcasing to them the range of exciting careers available if they do. The careers featured in the campaign reflect the interests and aspirations of young people by including sectors such as telecoms, conservation, beauty, space, music and architecture.

The campaign's case studies have been chosen to challenge a number of common myths surrounding the types of careers that result from the study of science and maths subjects, including the perception that a degree is required or that all work is laboratory-based.

At the heart of the campaign sits a website, **www.scienceandmaths.net**, hosted on the social networking site Bebo. All external communications activity, including a combination of advertising and PR, is designed to drive young people, and their parents, to this site to view the featured careers.

Looking at activity to date, in reaching young people, a series of radio adverts featuring a number of the career case studies and advertising the web address have run on popular national youth radio stations. News coverage has included features of the case studies on popular teenage websites and in youth audience magazines.


The campaign also speaks to parents to encourage them to support their children in considering science and maths, post 16. Media coverage to reach parents has included case study careers features in national newspapers.

Teachers and careers professionals are also targeted by the campaign to help them in advising students as they choose their post-16 options. Media coverage to reach the workforce has included articles in education sector trade magazines and key broadcast programmes.

Looking forward, the integrated communications campaign is being extended with a new advert in cinemas, inviting young people to consider where science and maths subjects could take them in the future. The adverts will be supplemented by a range of new case studies on the campaign website, an innovative Bluetooth campaign, accessing young people via their mobile phones, and a series of press features on those career areas. Digital advertising, on key youth sites, will also be rolled out, to be followed by further radio advertising in the New Year.

Stakeholders are vital in amplifying the work of the communications campaign. The Department welcomes any referencing of the campaign website in external literature or activity undertaken by stakeholders, and has also benefited from the support of stakeholders in developing the range of case studies currently showcased on the site. The best way for stakeholders to keep in touch is to subscribe to the regular stakeholder campaign newsletter.

To subscribe, please email *hannah.vincent@fishburn-hedges.co.uk*.

## Future Morph

Future Morph is a website resource for young people, aged 11-19 years, to help engage them in studying science and maths at school by demonstrating the huge range of career opportunities available by pursuing those subjects, post 16.

The site, at **www.futuremorph.org**, is designed to complement the integrated communications campaign website (**www.scienceandmaths.net**), by highlighting just how relevant science and maths subjects are in the current and future economy and job market, and how they relate to a wide variety of roles and sectors, many of which are not readily associated with these subjects. It is intended to inspire young people to regard studying science and maths post 16 as a way of keeping their vocational options open, rather than setting them on a path to a role traditionally linked to science and maths.

Future Morph also equips the workforce, including teachers and careers advisers, with a range of information and multi-media tools to help them engage their students and deliver key stage three (for ages 11-14 years) of the science curriculum. This includes videos and suggested practical exercises to teach key stage three science in a way that relates it to the workplace, advice on engaging students and sourcing relevant speakers, details of available careers information and links to other science and maths careers sites, and information on where to access further relevant teaching resources.

The project is led by the Science Council, part-funded by the Department for Children, Schools and Families and has been produced with involvement from a range of stakeholder partners, including the Association for Science Education, the Royal Society of Chemistry and the Institute of Physics. Stakeholders can play a continued role by encouraging colleagues, partners and their own youth and workforce audiences to visit the site and make full use of its content.

## Careers Awareness Resources

Complementing the public-facing elements outlined above, the Careers Awareness Resources activity provides support directly to schools, teachers, careers education and IAG professionals in the form of online tools.

Scheduled for launch from early January 2009, these high-quality STEM careers materials, relating to KS3 onwards will be linked to subject and qualification choice, and will deliver advice and support from a range of providers, as well as a map of all STEM careers resources available. The future morph website will host many of the new resources and also has targeted areas for teachers and IAG providers.


Key elements of the resources include:

**STEM curriculum-related careers pack –**
this series of short lesson starters and interventions will give teachers new multimedia content, teaching techniques and workplans to encourage students to explore STEM career opportunities. A range of activities will be provided to capture the imagination of students in the most powerful way including: exploration of the media's portrayal of "science", role-simulation and real-life problem-solving.

**CPD for Teachers and Trainees –**

Focusing on how teachers can increase young people's understanding of the nature of STEM careers, this comprehensive programme of CPD for teachers and trainee teachers will involve:

- A series of eight 15 minute programmes for Teachers TV which can be watched via its TV channel or website, with related resources available for download
- A programme of CPD modules designed to meet the needs of teachers and schools with a range of delivery methods to enhance school practice.

**IAG Professionals' support packs –**

these resources will be specifically tailored to the needs of IAG professionals with the aim of developing their understanding of the complexity of some STEM career pathways and providing advice on how best to signpost students in the right direction.

**Economic Wellbeing pack –**

in support of the curriculum's new Personal, Social, Health and Economic Education (PSHEE) requirement, this pack will equip STEM teachers to plan and deliver motivational learning activities which will strengthen students' understanding of the benefits of STEM careers for their economic wellbeing.

**Work placements, mentors and role models packs -**

a suite of resources designed to stimulate greater, real-life understanding and experience of STEM careers. Features include:

- Provision of additional careers-focused training to the STEMNET Science and Engineering Ambassadors scheme
- Inspiring models of work experience for all young people, building on the award-winning Wider Horizons work experience programme for girls
- Setting up of a mentoring scheme amongst individuals of varying ages and backgrounds with a focus on those under-represented in STEM.

**Quality Standards Framework**

As part of this workforce resource development, a set of guidelines for STEM careers information is also being created. Based on the national standards for IAG professionals, these guidelines will provide stakeholders with a simple checklist against which to benchmark all their own STEM careers-related activity.

**MathsCareers website**

As part of this package of work, funding has also been allocated to update *www.mathscareers.org*, the existing website promoting the range of careers from which maths can lead. The update will see new careers resources for teachers and IAG professionals and will bring it into close partnership with the Future Morph site.

All elements of the Careers Awareness Resources work will be subject to rigorous independent evaluation into both processes and impact, to provide data to inform future developments.

The Centre for Science Education with their partner VT Enterprise are working with a wide range of organisations to deliver this comprehensive suite of resources. All stakeholders have a vital part to play and can actively contribute by:

- Providing role models, case studies, teaching resources and supporting the provision of work experience to young people
- Engaging with local schools and support STEM-related careers education
- Exploring how the STEM industry can better present to young people the attractiveness and benefits of working in STEM

## *Careers Awareness Timeline Pilot*

The Careers Awareness Timeline Pilot is an innovative project designed to establish a more coherent structure for young people to learn about careers relating to science and maths during key stage three (11-14 years).

The project involves 30 pilot schools, of all types, sizes and locations, in developing and testing a number of activities that make the link for young people between the study of science and maths and the knowledge, skills and attitudes relevant for their future careers during key stage three. Each year group is offered activities, both within and outside the mainstream curriculum and appropriate to their age range, that provide a progressive programme throughout key stage three.

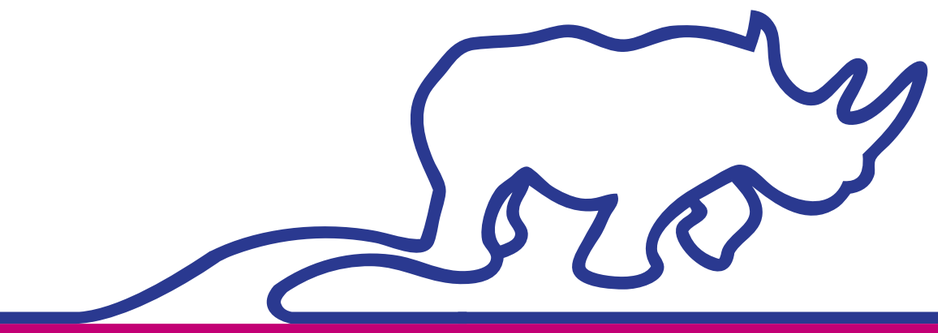
These activities or programmes will provide the strategy and models (referred to as career awareness 'timelines') that could be implemented and further developed by other schools. The project will assess the effectiveness of the programmes in influencing young people's attitudes toward science and maths.

The key elements of the project are as follows:

- Pilot development programme in 30 schools, across nine regions of England, with mentor support available to each school (currently until March 2011)
- Initial activity includes an audit of current in-school provision to help support planning and encourage collaboration between the schools' key STEM departments and careers services
- Current attitudes of key stage three students in relation to STEM subjects and careers are also polled, to establish benchmark data against which the success of the project can be evaluated
- Provision of support materials designed to help schools develop their own plans to properly integrate careers awareness with the study of science and maths during key stage three (currently until March 2011, incorporating ongoing feedback from pilot schools)
- Two series of regional stakeholder conferences and workshops, to involve the pilot schools and the wider education and STEM community (February/March 2009 and October/November 2010)
- Production of case study programmes/schools to help in sharing best practice more widely (September 2009 and February 2011)
- Ongoing liaison on the 'lessons learnt' between the project and the wider STEM community (throughout the project)

The project is led by the Centre for Education and Industry (CEI) at the University of Warwick, working in partnership with the International Centre for Guidance Studies (University of Derby) and the Isinglass Consultancy.

Stakeholders can contribute to the project by highlighting the work of the project to any school contacts or by taking part in the conferences and workshops planned for 2009 and 2010. The project is also interested in case studies of people that have benefited from studying STEM subjects. Interested organisations should contact Peter Stagg, Regional Director of the CEI.





# 5. Key Messages and Next Steps

The wider STEM community is far-reaching and influential. It therefore has a major role to play in encouraging the uptake of STEM careers, not to mention a significant vested interest. To do this with maximum effect, however, the approach must be co-ordinated, collaborative and complementary, with all stakeholders sharing common goals and best practices.

## Key Stakeholder Messages

There are a range of initiatives being undertaken to improve STEM careers awareness and uptake:

- Integrated communications campaign
- Future Morph website
- Workforce resources
- Awareness timeline

These initiatives need the support of the stakeholder community to succeed. This support should be

- Co-ordinated - be aware of other initiatives and how there could be mutual benefits to working together
- Collaborative - share ideas, resources, expertise across all stakeholder activity
- Complementary - avoid duplication of activity, ensure projects underpin each other rather than compete or cannibalise

## How can stakeholders support?

Stakeholders can help in the following ways:

- Actively talk about the campaign and its various initiatives to other stakeholders and education workforce professionals, especially during key opportunities such as conferences and seminars
- Review your own organisation's existing activities and assess how they could work with the campaign, e.g. case study collateral, work experience provision
- Reference the various campaign activities in your own literature and link to websites where relevant
- Use and encourage others to use the Future Morph and scienceandmaths.com websites
- Sign up for the Science & Maths campaign letter
- Explore and share your organisation's ideas for how the STEM industry, collectively, can better present to young people the attractiveness and benefits of working in STEM

**For further information and to find out more about how you can get involved please contact the National STEM Careers Co-ordinator at:**

**stemcareers@shu.ac.uk**

**T: 0114 225 4677**

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department for
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**SEE WHERE THEY CAN TAKE YOU**