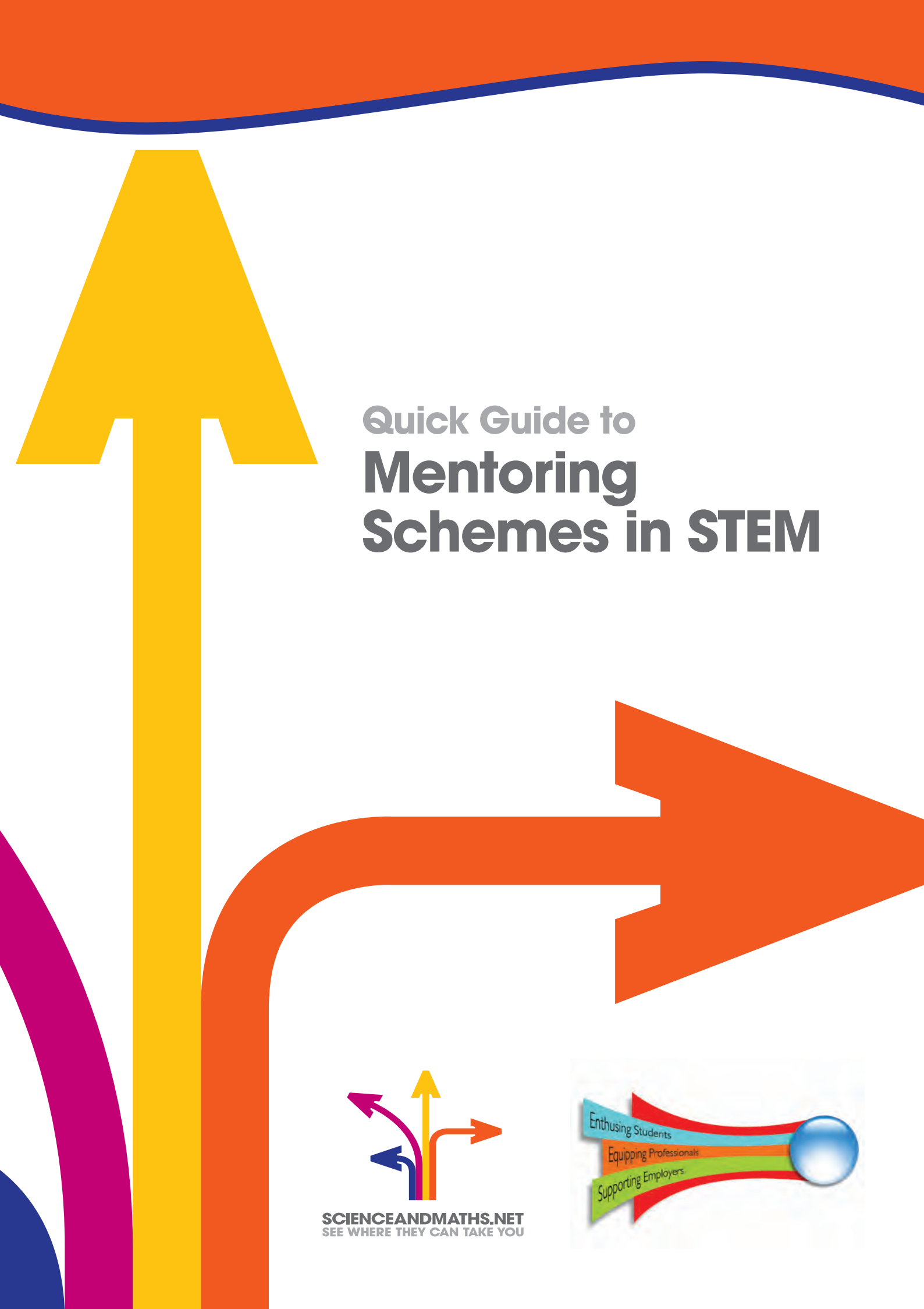
Quick Guide to

Mentoring Schemes in STEM



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Acknowledgements

This guide arises from the STEM* Subject Choice and Careers Project undertaken by the Centre for Science Education at Sheffield Hallam University and Babcock, on behalf of the Department for Education (DfE). It is recognised that mentoring may be useful in supporting different groups and promoting the update of STEM subjects, and this guide is intended to help schools and colleges encourage their students to access STEM mentoring schemes. The STEM Subject Choice and Careers Project would like to acknowledge the valuable work of all the organisations featured in this document for their work in supporting young people with their career choices and progression.

For more information, please visit: **http://www.shu.ac.uk/research/cse/stem-careers.html**

If other organisations and schemes would like details of their mentoring schemes to be included in this document, we would be delighted to hear from them. We also welcome more general feedback to inform the updates and supplements to this resource.
Please email us at **info@careersinstem.co.uk**

*Science, Technology, Engineering and Maths

Contents

STEM Subject Choice and Careers Project - background and context

This guide has been developed through the STEM Subject Choice and Careers Project. It is designed to help schools and colleges signpost pupils and students to mentoring schemes which are relevant to the world of Science, Technology, Engineering, Maths and Built Environment.

Skills shortages in the Science, Engineering, Technology, Maths and Built Environment sectors are well documented, and will continue to be an issue whether we are in a period of recession or recovery. The three year STEM Careers Action programme is one of eleven that make up the National STEM Programme. Action Programme 8 is charged with improving the quality of advice and guidance about STEM careers to inform subject choice. The STEM Careers Action Programme (AP8) is managed by the Centre for Science Education and Babcock, on behalf of the Department for Education. The project is part of a substantial national investment to combat the decline in the numbers of students choosing subjects, courses and careers in the STEM field. The key message is that a decision to study STEM subjects leads to a very wide range of interesting and well paid careers, inside and outside the STEM arena.

The Centre for Science Education and Babcock are developing a wide range of curriculum resources, careers workforce resources and continuing professional development over the life of the project under the themes of 'enthusing students, equipping professionals and supporting employers'.

The other strands of the campaign are

- Careers Awareness Timeline Project, led by Centre for Education and Industry, University of Warwick
- www.futuremorph.org - the Science Council-led STEM careers website aimed at young people
- a communications campaign which ended in March 2010 involving TV and cinema advertising, aimed at young people

(website - www.scienceandmaths.net - a specific section of the Future Morph website)

Further information

To ensure you receive news about curriculum resources and direct access for downloadable resources as they become available, please email **info@careersinstem.co.uk**

What is mentoring?

Duration of contact / Contact type	Fixed period	Ongoing
Email, phone	Mentoring relationship via email/ phone	Mentoring relationship, website profiles with an opportunity to ask questions
Face to face	Work experience placements, mentoring relationship, residential events	Mentoring relationship, ongoing support in schools to a club or group of young people

There are many different forms of mentoring and many different circumstances where mentoring may be used to support young people (See the grid above which has been adapted from The Royal Society's publication ' Taking a leading role'). To quote the Mentoring and Befriending Association, mentoring involves 'the development of one to one relationships based upon trust, confidentiality and mutual involvement. The relationship is often voluntary with the goal of providing practical assistance and support'. In the context of STEM mentoring and this guide, a mentoring relationship with a more experienced student or STEM professional is likely to be co-ordinated through a formal process or organisation. Some of the schemes listed in this document revolve around a particular project or work experience placement which gives a focus for the mentoring relationship over a time-limited period. Others are organised on a more long-term basis through a club or group or web resource. Some forms of mentoring are face-to-face, while others function very effectively online. Schools may offer their own in-house schemes where senior pupils mentor those lower down the school, and they may also work with local Universities and colleges to encourage progression through inviting mentors from FE and HE to support pupils. The external schemes included in this document complement what is provided in schools and offer an insight into the world of industry and further study.

Where does mentoring fit?

Mentoring is often provided at crucial decision and development points; i.e. at transition from primary to secondary education, prior to FE/HE, when starting a new role in a new company etc. Within the context of this document, mentoring is seen as a potential influencer to wider career choices and to challenge stereotypical views of particular careers.

Who are STEM mentors?

STEM mentors are people working and studying in Science, Technology, Engineering, Maths and Built Environment who are often encouraged by their company or organisation to 'put something back into the community'. This can be achieved by volunteering as an Ambassador or mentor to support young people with their career choices and progression. Sharing their experiences and enthusiasm for their subject is one part of the equation, but mentors are also required to help young people think through ideas and arrive at their own conclusions for their future development. The best schemes involve training for their mentors and sound feedback mechanisms to ensure that any difficulties encountered are rectified immediately.

How might mentors support pupils / students in your school/college?

If mentoring is provided in the right way, at the right time and in the right context, pupils and students will be able to access information and support that they would probably be unlikely to find themselves. They will have the opportunity to ask direct questions of people who have had similar experiences and/ or are in work or undertaking study that is relevant to the pupil's or student's interests. A mentor can help their mentee reflect on the information available to them, and make more informed career choices. A mentor provides another 'sounding board' for ideas and concerns, and a listening ear from a person who is not caught up in family issues, school priorities etc. At best, a mentoring relationship can help young people develop skills to support their decision making throughout their future careers.

"I have been using the mentoring website for about 3 years now, and it's been a great help to me. I've had help with my personal statement, my normal subjects at college and with interviews at university. We've discussed my career and university choices, gap year/ 3rd year college plans, financial situations, social life and so many other things."

- Bright Journals mentee

Top tips for developing an effective mentoring programme

Schools, colleges and individual students and pupils may decide to opt in to one of the mentoring schemes included in this booklet, or to others that are on offer, while some institutions prefer to set up their own scheme from scratch. Whichever way a mentoring scheme is approached, there are some key principles which will help ensure that the scheme runs smoothly and that both mentees and mentors have a valuable experience. These principles can be summarised as follows*:

- Define clearly who the mentoring programme is for.
- Set some clear objectives and targets for the programme to help you publicise and evaluate it.
- Don't underestimate the need to publicise your programme and actively recruit mentees and mentors.
- Ensure that both mentees and mentors are properly briefed/trained and that they understand the purpose of the programme and their own roles and responsibilities.
- Provide a central referral point for mentees and mentors who have questions or problems.
- Actively monitor the mentoring activities to ensure participants are maintaining contact, are utilising appropriate mentoring skills and are adhering to the values of your mentoring programme.
- Evaluate the activities and use the feedback to develop your programme

*Acknowledgements. JIVE Partners project, 2007

A to Z of STEM mentoring schemes

1.

bigbangblogs	**Big Bang Blogs**
Age/ target group	Age 14-19
Description	Big Bang Blogs has been developed by BrightsideUNIAID as part of the Stimulating Physics Network, a nationwide programme run by the Institute of Physics. Building from a successful pilot, Big Bang Blogs helps encourage young people, especially women, to study or work in a physics related profession. Advice and support is provided by a mentor who is either a physics undergraduate student or a professional working in the area.
Delivery	The website provides safe and secure e-mentoring support plus: • a personalised homepage, which mentees and mentors can customise according to their interests • access to over 1,000 online resources featuring information on careers, student finance and university • interactive online activities, which are linked to the PSHE curriculum and are designed to give structure to the mentoring relationship and help mentees develop life skills • comprehensive training for all mentors and mentees • online mentor training and a mentor support network to aid their own personal development and share best practice
Links to the website activities/resources	www.bigbangblogs.org

2.

brightjournals	**BrightsideUNIAID's Bright Journals**
Age/ target group	14-19 year old students interested in Medicine and health care
Description	Bright Journals, run by BrightsideUNIAID for over seven years, helps socially disadvantaged young people to enter the medicine/healthcare profession. It connects young people with mentors, who are either medical/healthcare undergraduate students or a professional working in the area. Mentors provide help and practical advice on personal statements, UCAS applications, education and career options to their mentees.
Delivery	The website provides safe and secure e-mentoring support plus: • a personalised homepage, which mentees and mentors can customise according to their interests • access to over 1,000 online resources featuring information on careers, student finance and university • interactive online activities, which are linked to the PSHE curriculum and are designed to give structure to the mentoring relationship and help mentees develop life skills • comprehensive training for all mentors and mentees • online mentor training and a mentor support network to aid their own personal development and share best practice
Links to the website activities/resources	**https://www.brightjournals.org/**

3.

Bright Links	**BrightsideUNIAID's Bright Links**
Age/ target group	Age 14-18
Description	Bright Links aims to support young people from socially disadvantaged backgrounds to progress into Higher Education. It supports all subjects including STEM. It connects young people with mentors who are studying or working in the STEM sector, who can help them with their education and career options.
Delivery	The website provides safe and secure e-mentoring support plus: • a personalised homepage, which mentees and mentors can customise according to their interests • access to over 1,000 online resources featuring information on careers, student finance and university • interactive online activities, which are linked to the PSHE curriculum and are designed to give structure to the mentoring relationship and help mentees develop life skills • comprehensive training for all mentors and mentees • online mentor training and a mentor support network to aid their own personal development and share best practice
Links to the website activities/resources	**https://www.brightlinks.org/**

4.

Brightside UNIAID	**eMentoring**
Age/ target group	Age 14-25
Description	BrightsideUNIAID is an education charity that aims to help individuals from socially disadvantaged backgrounds to feel inspired and confident, explore their options, build skills,get informed and prepared, and make the right education and career choices. E-mentoring programmes support: • the transition of school/college students interested in STEM into FE, HE, apprenticeships and employment • the retention of undergraduates studying STEM in HE • the transition of undergraduate students studying STEM into employment • school teachers delivering STEM subjects via mentoring support from professionals in industry.
Delivery	The website provides safe and secure e-mentoring support plus: • a personalised homepage, which mentees and mentors can customise according to their interests • access to over 1,000 online resources featuring information on careers, student finance and university • interactive online activities, which are linked to the PSHE curriculum and are designed to give structure to the mentoring relationship and help mentees develop life skills • comprehensive training for all mentors and mentees • online mentor training and a mentor support network to aid their own personal development and share best practice
Links to the website activities/resources	**http://www.brightsideuniaid.org/what_we_do/ementoring**

5.

Bright Links Engineering	**Bright Links Engineering**
Age/ target group	14-19 year old students studying engineering courses in Further Education (FE) colleges
Description	Young people are connected with engineering mentors who will support them through the challenges and opportunities they face as FE engineering students. Bright Links Engineering, managed by BrightsideUNIAID, forms part of the wider Engineering Further Education project being run by The Royal Academy of Engineering with support from BP plc.
Delivery	The website provides safe and secure e-mentoring support plus: • a personalised homepage, which mentees and mentors can customise according to their interests • access to over 1,000 online resources featuring information on careers, student finance and university • interactive online activities, which are linked to the PSHE curriculum and are designed to give structure to the mentoring relationship and help mentees develop life skills • comprehensive training for all mentors and mentees • online mentor training and a mentor support network to aid their own personal development and share best practice
Links to the website activities/resources	**https://www.brightlinksengineering.org/**

6.

	**CREST Awards**
Age/ target group	KS3, KS4 and Post 16 (age 11-19)
Description	The British Science Association Creativity in Science and Technology Award Scheme is a nationally recognised accreditation scheme for project work in science and technology. CREST is a project-based awards scheme for the STEM subjects (Science, Technology, Engineering and Maths). It links the personal passions of students to curriculum-based learning. CREST can link into work experience placements, after-schools clubs or numerous linked schemes. Students can investigate or design and make, research a subject, or design a science communication project. Awards are available at three levels (bronze, silver and gold).
Delivery	Through a mentoring system, the scheme facilitates links between schools and industry or higher education. It enables students of all abilities to explore real scientific, engineering and technological problems for themselves and promotes work-related learning. The mentors will be based in companies or universities and will be practicing in relevant fields of STEM.
Links to the website activities/resources	**http://www.britishscienceassociation.org/crest**

7.

Engineering Education Scheme England & Scotland EDT	**Engineering Education Scheme**
Age/ target group	Y12 only
Description	The Engineering Education Scheme provides young people with an insight into the world of science, engineering and technology. This invaluable experience enables students to make a more informed career decision through a better understanding of the opportunities available in science, engineering and technology. Students are involved in a 6-month project similar in structure to Go4SET but focusing on a bespoke industrial project, and enhanced by a 3-day University Residential programme.
Delivery	Mentors work closely with groups of 4-6 Y12 students, and offer opportunities for interaction with their company though arranging 'twilight' visits for example. An assessment and celebration event is held, often at the company base and involving other members of company staff. The project lasts around 6 months and includes the following special events: • Company visit to see the project in context • Scheme launch • Regional university Residential Workshop (RW) • Minimum of 3 days at a university or similar venue to utilise the facilities and progress the project • Celebration and Assessment Day (CAD)
Links to the website activities/resources	http://www.thescheme.org.uk/

8.

First Edition EDT	**First Edition**
Age/ target group	Years 7 - 10 (age 11-15)
Description	Part of EDT's Widening Participation programme which aims to encourage pupils from under-represented groups with a current focus on pupils who will be 'first in family', to consider higher education and courses and careers in STEM. Curriculum enrichment days for pupils of all abilities, held in universities and schools. Designed to encourage creativity and innovation through hands on practical activities focused on team working and problem solving. First Edition is intended to be the first step to a range of STEM-related education options.
Delivery	STEM Ambassadors support all First Edition Days and informal mentoring of participants may occur as a result. Students will often be given the opportunity to take their experiences further though getting involved in the Go4SET initiative also offered by EDT.
Links to the website activities/resources	http://www.etrust.org.uk/first-edition.php

9.

Go4SET EDT	**Go4SET**
Age/ target group	Year 8/9 (age 11-14)
Description	Go4SET links teams of six Y8/9 (England) and S2 (Scotland) pupils with a mentor based in a company or university to offer a 10 week STEM experience, highlighting future career opportunities in SET and providing work related learning within an industrial enterprise context. Benefits to pupils• Work related learning• Experience of industrial enterprise• Wider awareness of STEM within a global context• Teamwork and problem solving• Promotion of creativity and innovation• Project management and presentation/ communication skills• Personal Development Education
Delivery	The aim of Go4SET is to stimulate the interest of young people in science, technology, engineering and mathematics (STEM). This will be achieved by providing a real and live STEM project which will raise pupils' awareness of andhighlight the exciting future career opportunities available in SET. Go4SET provides the pupils with the opportunity of working with and being mentored by Scientists, Engineers and Technologists chosen from the complete spectrum of SET disciplines. Pupils can contact the mentor in between weekly meetings. Each mentor also arranges a company visits for their teams. All projects have an environmental focus. The scheme finishes with an assessment and celebration day involving the mentor and their organisation.
Links to the website activities/resources	http://www.go4set.org.uk/go4set.html

10.

Headstart EDT	**Headstart**
Age/ target group	Y12
Description	A series of 5-day summer schools with a single focus on covering a range of subjects, involving industrial input.
Delivery	Informal, unstructured mentoring relationships may grow out of Ambassadors involvement in the Summer schools which are delivered at universities nationwide
Links to the website activities/resources	http://www.headstartcourses.org.uk/

11.

Imperial College London	**The Pimlico Connection, Imperial College**
Age/ target group	Primary and Secondary (State schools only)
Description	Offers state schools in London (both primary and secondary) that are close to the main college campus in South Kensington, the chance to have some Imperial College undergraduates assisting in science, maths, ICT or D&T classes.
Delivery	Mostly in London area from November to March each year
Links to the website activities/resources	http://www3.imperial.ac.uk/pimlico

12.

Institution of MECHANICAL ENGINEERS	**Institution of Mechanical Engineers - Engeneration**
Age/ target group	13-19
Description	Free to join membership scheme for students of Science, Technology, Engineering and Maths, including the Engineering Diploma and other qualifications that can lead to a career in Engineering.
Delivery	Careers advice and profiles of real engineers, support with Insight learning materials, trips and events.
Links to the website activities/resources	http://www.engeneration.imeche.org/

13.

IT ambassadors	**IT Ambassadors**
Age/ target group	14-25
Description	Pioneered by BT in collaboration with BrightsideUNIAID and the national STEM Ambassador scheme, IT Ambassadors connects young people and their teachers with those working in the communications and IT sector. The aim is to support teachers and young people by growing understanding of what the IT sector does, how it works and the technologies used.
Delivery	The website provides safe and secure e-mentoring support plus: • a personalised homepage, which mentees and mentors can customise according to their interests • access to over 1,000 online resources featuring information on careers, student finance and university • interactive online activities, which are linked to the PSHE curriculum and are designed to give structure to the mentoring relationship and help mentees develop life skills • comprehensive training for all mentors and mentees • online mentor training and a mentor support network to aid their own personal development and share best practice Mentors can also produce content about new developments in technology and IT careers, which are shared with both young people and IT teachers, to support their delivery in schools, and encourage more young people to enter the IT profession. IT Ambassadors are also on hand to answer questions direct from teachers, giving expert explanations of the latest developments in the field.
Links to the website activities/resources	**https://www.itambassadors.org.uk/**

14.

	**MentorPlace**
Age/ target group	Schools pupils and students
Description	MentorPlace is a volunteer program that brings adult professionals and students together in online relationships focused on academics. Employee-volunteers are charged with providing students with academic assistance and career counselling, while letting them know that adults do care about their issues and concerns.The program was designed and piloted by the IBM Corporation as part of its global community relations program. ePals, Inc., a company committed to promoting and expanding quality online mentoring programs around the world, has developed the unique software that is being used by MentorPlace programs around the world.
Delivery	Participants are required to: • Have access to technology; • Participate in comprehensive program and technology training; • Communicate online at least once a week with each other; • Meet each other in person (where possible) at a structured orientation to kick-off the program and at an end-of-the-school year celebration
Links to the website activities/resources	http://ibm.mentorplace.epals.org/WhatIs.htm

15.

MentorSET	**MentorSET**
Age/ target group	Women in STEM work and study
Description	MentorSET provides independent mentors who understand the challenges faced by women working in STEM careers who can provide support and advice.
Delivery	Usually face-to-face but can be online
Links to the website activities/resources	http://www.mentorset.org.uk/

16.

RSC | Advancing the Chemical Sciences	**Royal Society of Chemistry - Scimitar Europe**
Age/ target group	Secondary schools
Description	Chemists and related scientists who want to encourage future generations to follow in their footsteps offer mentoring to young people to encourage interest in STEM subjects.
Delivery	Europe wide. Led by educational charity Surrey Satro (Science and technology regional organisation)
Links to the website activities/resources	http://www.rsc.org/chemistryworld/Issues/2009/February/EuropeWideMentoringScheme.asp

17.

	**Smallpeice Trust**
Age/ target group	Y9-12
Description	The Smallpiece Trust offers residential courses for young, aspiring engineers, and provides them with the chance to connect with industry professionals and technical specialists. Based at some of the country's leading universities and other secure venues across the country, courses are available to young people in school years 9 -12. Residential courses in Universities across the UK designed to engage young people with engineering and science.
Delivery	Residential programmes begin at Year 9 with Engineering Experience, Marine Technology and Railway Engineering courses. These are designed for students who are considering their GCSE options. The Trust offers a continuum of courses, year on year, up to Year 12. During the courses, students will have access to material and equipment that may not be available in school, giving them a unique opportunity to build on their existing knowledge of engineering and technology. Projects and workshops are based on real-life scenarios and engineering professionals are on hand to offer advice and guidance. They also help to develop interpersonal and transferable skills. Mentors support students on the courses and may continue this on an informal basis thereafter
Links to the website activities/resources	**http://www.smallpeicetrust.org.uk/**

18.

Social Mobility Foundation	**Social Mobility Foundation** **Aspiring Professionals programme (APP)**
Age/ target group	Predominantly Y12/13
Description	Provides mentoring, internships, workshops on Higher Education, and careers advice. The aim of the mentoring programme is to provide students with an individual who can act as a resource, sounding board and role model. Through the mentoring programme, students can begin to fully understand life in the sector they are interested in and employers and individuals can help the next generation of talented students enhance the skills that their industry needs for the future.
Delivery	Structure programme with training and regular bulletins. The mentoring is predominantly online, with optional meet-ups throughout the year. Email communication between mentor and mentee is encouraged to be on a weekly basis through the SMF website.
Links to the website activities/resources	http://www.socialmobility.org.uk/app-2011/mentoring/

19.

STEMgirls	**STEMgirls**
Age/ target group	School age girls
Description	STEMgirls has a team of female advisors who all have direct experience of working in STEM industries, showing the vast potential of non-stereotypical jobs available in currently male dominated fields, and illustrating daily life working in a particular STEM field.
Delivery	Moderated online conversations between girls interested in STEM and women working and studying in a range of sectors.
Links to the website activities/resources	http://www.stemgirls.co.uk/

20.

Youth Creativity Urban Design Stephen Lawrence Charitable Trust	**Stephen Lawrence Trust**
Age/ target group	Primarily aimed at 16-19 year olds but some support is also available for undergraduates and post-graduates
Description	The mentoring programme is geared to support young people who have an interest in a career in the built environment.
Delivery	Delivered as part of a range of longer programmes including Youth Creativity and Urban Design
Links to the website activities/resources	http://www.stephenlawrence.org.uk/programmes/

21.

	**Year in Industry**
Age/ target group	Gap Year Students or Undergraduate placements
Description	All participants are assigned an industrial mentor who oversees a student's progress within the placement throughout the 10 month period. This mentoring relationship may extend beyond the Year in Industry to support further career progression within STEM.
Delivery	http://www.yini.org.uk/faq.php For more information, visit the Frequently Asked Questions section of the Year in Industry website
Links to the website activities/resources	**http://www.yini.org.uk/information.php?information_id=1&sections_id=1**

22.

	**Young Engineers**
Age/ target group	Ages 7 to 19.
Description	Young Engineers is a registered charity that manages a national network of extracurricular engineering clubs in both the primary & secondary sectors. Its high profile engineering competitions include Young Engineer for Britain for secondary school students and Junior Engineer for Britain K'NEX Challenge for primary pupils as well as engineering competitions for its national sponsors, Project Eggs Factor and Regional Challenge Days, which are open to all UK based students. The Young Engineers Club Network supports the setting up of extra-curricula engineering clubs and enriches the activities of existing clubs and is free to join.
Delivery	Mentors offer advice and support to competition entrants . All of competitions are open to all UK based students whether in school, college, youth groups or clubs.
Links to the website activities/resources	http://www.youngeng.org/home.asp

Finding out more

- Register with the STEM Careers project to get access to all the resources developed through the STEM Subject Choice and Careers Project. **info@careersinstem.co.uk**
- To access the STEM Careers Awareness collection visit the National STEM Centre at **www.nationalstemcentre.org.uk**
- For information about professional organisations and other bodies supporting STEM education and careers, refer to the STEM Choices Pack **http://www.futuremorph.org/_db/_documents/STEM-section9.pdf**
- For information on Non STEM-specific mentoring sites visit BrightsideUNAIID **www.brightsideunaid.org**, e-mentor pro **http://www.e-mentoring.net/** or Horses Mouth **http://www.horsesmouth.co.uk/**

References/ acknowledgements:

Mentoring Good Practice Guide, UKRC 2009
http://www.theukrc.org/files/useruploads/files/organisations/mentoring_gpg_2009.pdf

How to Guide: Mentoring, JIVE Partners, 2007
http://www.jivepartners.org.uk/products/documents/jivehowto_%20Mentoring.pdf

Inova Consultancy, Inova represents WiTEC (European Association for Women in Science, Engineering and Technology) in the UK
http://www.inovaconsult.com/mentoring.shtml

Mentoring and Befriending Foundation
http://www.mandbf.org.uk/about/definitions/

Science Aspirations and Career Choice: Age 10-14, Kings College London
http://www.kcl.ac.uk/schools/sspp/education/research/projects/aspires/

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A Department for Education initiative to promote subject choice and careers in Science, Technology, Engineering and Maths (STEM) delivered by the Centre for Science Education at Sheffield Hallam University and Babcock.

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