Lesson one: impact on young people

**STEM Ambassadors inspire young people** to better engage with, and continue to study, STEM subjects and to explore STEM careers.

Our independent evaluation shows that STEM Ambassadors can inspire young people to get more involved in STEM subjects. As a result of working with STEM Ambassadors, more than eight in ten teachers reported that: their students’ awareness of the importance of STEM had increased (89%), as had their knowledge and understanding of STEM, and the students were now more engaged in STEM subjects (83%).

STEM Ambassadors play a vital role in helping young people to understand why STEM subjects are important, and how widely they can be applied in the world of work. More than nine in ten young people reported this as one of the ways they had benefitted from STEM Ambassador support. Their teachers agree:

“Pupils now have an improved understanding of the applications of mathematics and its relevance in the real world and in many different careers. They appear more engaged and have a genuine interest in the subject and in continuing this course of study at university.”

**Mathematics Teacher, Scotland**

Young people respond well to STEM Ambassadors: 76% reported that their experience of working with one was either good or very good. STEM Ambassadors are often strong, positive role models for them: evaluation and feedback demonstrates that female STEM Ambassadors can have a particularly positive impact on girls, showing them how important it is for young women to progress into STEM-related work:

“[The STEM Ambassadors] inspired the girls in under-represented STEM subjects, such as physics, by showing them how they connect with issues girls care about and their gateway to interesting careers.”

**Teaching and Learning Coach, Harwich and Essex**

In some areas, teachers report that STEM Ambassadors change young people’s mindsets about careers and the world of work, as they may not have had much previous contact with people who are passionate about their jobs:

“They saw that the STEM Ambassadors loved their work - an alien concept to many, as most of our children are third generation unemployed.”

**Assistant Head Teacher and ‘World of Work’ Co-ordinator, Birmingham**

Young people’s perceptions of their own abilities, and their own suitability relating to a possible career in STEM are also challenged by STEM Ambassadors, as reported by their teachers:

“The impact [of STEM Ambassadors] is widening horizons and raising awareness and raising aspirations because some of the children don’t think they have the skills and abilities to be successful in a field. But, when they meet someone who tells their story about what they did, and how they got there, it can really help them have that confidence to progress.”

STEM Ambassadors provide informal opportunities for young people to talk, ask questions, and explore ideas (and misconceptions) about careers and work. As a result, young people find themselves better able to engage in more informed career-related decision making. One teacher shared a conversation they had with some parents, who told her that their daughter:

“...really had a great time at the science day today, so much so that she said she would like to do something with science or engineering in her future. This is a huge impact in my opinion, as she has never wavered from her future only being around sport - until today!”

**Science Teacher, Cumbria**

Evidence shows that there is a higher impact upon young people the more they engage with STEM Ambassadors. Taking engineering as an example, NFER research showed that amongst pupils who had not engaged with STEM Ambassadors, 40% said they knew why engineering was important for every-day life. However, this percentage increased to 54% for those who had met an Ambassador once, and increased again to 69% for those who had met a STEM Ambassador on several occasions.
Pakefield High School opened in September 2011. It is a Foundation High School in Lowestoft.

Case study

Mr Anthony Vaughan-Evans, Director of Science, Technology, Engineering & Maths Pakefield High School

Getting young people to see the mathematics that I teach them in action is at the heart of my approach to working with STEM Ambassadors. Where we are based, in Lowestoft in Suffolk, we are lucky to be surrounded by a huge range of STEM-based companies.

I work with STEM Ambassadors by visiting their business to see how mathematics is being used and to find examples of the concepts that my students will be learning in their lessons in action. Then, working with their organisation, I develop a challenge for my students. Young people get to visit the site and see the problem happening for real - contextualising our learning. They interrogate the STEM Ambassadors about their work, and also about how they use mathematics in their work, before going back to school to work on the challenge.

For example, I’ve used Perenco to help my teaching of volume. Perenco have massive pipelines out to their oil rigs in the North Sea, which over time fill with water. Those pipes need to be emptied out, and they do this by sending a sphere which is the same diameter as the pipe down each pipeline to flush out the water. So, I set my students the challenge to figure out the volume and the size of the spheres they would need to do this job.

Once back at school, the students work on their problem, and STEM Ambassadors come in to offer help. When they have come to a solution, the students present their ideas, explaining why and how they have come to that conclusion. STEM Ambassadors judge their ideas, and award prizes to those who have used the best approach to solve the problem.

I want to increase the number of girls going into engineering, and my work with STEM Ambassadors is definitely doing that. We went on one site visit, and there were three female engineers showing us around – two of our young people said straight away: “right, that’s what I want to do!”

Using this experience, I’ve now developed a scheme of work to contextualise mathematics. I’ve found that the students respond well: they get to do lots more hands-on work. Now, they determine how they solve a particular problem themselves rather than being explicitly told which mathematics to use, their awareness of relevant careers is hugely improved, and they are better engaged in their learning. That improved engagement leads to better motivated learners, better attainment, and more students wanting to pursue a career in a mathematics-related field.

STEM Ambassadors increase young people’s:

- Engagement in STEM: 90%
- Awareness of the importance of STEM: 89%
- Learning of STEM subjects: 86%
- Knowledge and understanding of STEM: 83%
- Understanding of why STEM subjects are important particularly in the workplace: 90%