



Skirting  
Science!  
2011

Evaluation of  
Objectives

## Headlines

Skirting Science is a one day hands-on event to inspire the next generation of female scientists.

It uses a successful model as evidenced by evaluation work from two previous events.

In 2011 Skirting Science was attended by 230 Year 9 girls from 15 North Somerset and Bristol schools.

Students had a choice of 18 interactive workshops delivered by science professionals.

Students indicate they learnt new things about science careers including:

- Increased knowledge of the wide range of science careers available
- Increased knowledge of progression routes into science careers
- Direct experience of carrying out some of the tasks undertaken by science professionals in their jobs

Students indicate their attitudes towards science and science careers have positively changed:

- Science careers are for girls as well as boys
- Science is seen as fun and interesting
- Increased number of students who will now consider a career in science
- Increased confidence they can achieve a career in science

Feedback from attending teachers also indicates a positive impact on students' knowledge and attitudes.

## **Background**

A recent report by Sir Mark Walport to The Rt. Hon. Lord Drayson, the then Minister for Science and Innovation, stated:

*'It is a truism to state that the future of the UK depends critically on the education of future generations. Science, technology, engineering and mathematics (STEM) must be at the forefront of education in order for the UK to address some of the most important challenges facing society....*

*Our economy is highly dependent on our ability to add value, through scientific, engineering and technological innovation – and through advanced manufacturing skills. Our national infrastructure is ageing; our natural environment is ever more influenced by the impact of humans. We owe it to our children to prepare them for an exciting and uncertain future – and education is the most powerful tool to achieve this.'* (Science and Mathematics Secondary Education for the 21st Century: Report of the Science and Learning Expert Group.)

In order to 'add value, through scientific, engineering and technological innovation' the country needs to attract the best minds, male and female, to STEM careers.

Whilst women in medicine, dentistry and veterinary science outnumber men at undergraduate level, in other STEM areas they're underrepresented. Speaking at the 'Decisions at 18' Careers Conference at Royal Holloway University of London on the 22<sup>nd</sup> April 2010, Paul Jackson, Chief Executive of Engineering UK, highlighted the disparity in the percentage of female engineering professionals in the UK compared to other European countries. Mr. Jackson announced that Engineering UK had carried out a recent review of the data relating to women in engineering and technology and identified UKRC research that showed that only 9 per cent of UK engineering professionals are women compared to 18 per cent in Spain, 26 per cent in Sweden and 20 per cent in Italy. ([http://www.engineeringuk.com/viewitem.cfm?cit\\_id=383326](http://www.engineeringuk.com/viewitem.cfm?cit_id=383326))

Skirting Science was conceived in response to this 'disparity'.

## **Skirting Science**

Skirting Science is a one day event that inspires the next generation of female scientists, and dispels misconceptions about science careers.

Year 9 girls participate in interactive workshops delivered by science and other STEM professionals, most of whom are female. The workshops cover a diverse range of fields; from paramedics to the Royal Navy. The girls get a first hand experience of being a scientist, finding out that creativity and passion are as important in science as any other career.

Skirting Science ran for the first time in 2009 at Wyvern Community School in Weston-super-Mare. Weston College, Wyvern Community School, the Weston-super-Mare branch of Soroptimists International, and the North Somerset LA worked collaboratively to organise the event. It was attended by nearly 200 Year 9 girls from 11 schools. Feedback from the students was overwhelmingly positive; the girls went away informed and inspired. A second event ran in 2010. The format was the same as the previous year, with twenty one workshops for students to choose from. The event was attended by 247 Year 9 girls from 11 schools. Full reports on the first two events can be found at: [www.spanglefish.com/NSISSP](http://www.spanglefish.com/NSISSP)

On the 13<sup>th</sup> May 2011 Skirting Science returned and took place at Hans Price Academy, the new name for Wyvern Community School. This year 230 Year 9 girls from 15 schools took part in 18 workshops. Compared

to previous years a greater proportion of workshops had a physics, maths, chemistry and engineering focus, as the organisers were aware that these are the areas where females are most under represented. Full details of the workshops can be found in the Skirting Science 2011 Programme.

### **Objective 1: To increase student's awareness of the range of science careers and progression routes into them.**

This was the primary aim of Skirting Science. Students took part in interactive workshops ran by science professionals, who were mostly women, in order to have a first hand experience of science careers. At the beginning of each workshop the presenters talked about their career, their route into it and what they enjoy about it. As a result of finding out first hand knowledge of science careers it was hoped the girls could make an informed decision about a future in science, as opposed to one based on misconceptions like 'science is for boys'.

All of the 179 students that completed the questionnaires talked about at least one aspect of their awareness of science careers that had increased as a result of attending Skirting Science. I think it is fair to say Skirting Science achieved this objective!

#### **59% of students commented on how Skirting Science had opened their eyes to the wide range of science careers:**

*'The workshops have been fun and practical. They have shown me there are lots of opportunities and careers.'*

*'This has opened my mind to jobs in science because there are so many you can do. I never knew that before.'*

Before taking part in Skirting Science some students only knew about a small number of science careers, such as laboratory workers and doctors:

*'There's a wide range of careers - not just chemists in labs.'*

*'I have found out there are more opportunities in science than I thought. It's not just doctors and chemists.'*

As discussed later on, a number of students commented that finding out about different careers will help them decide what they will do in the future:

*'I learnt there is more to science than first comes to the eye. This will be useful when it comes to picking my career.'*

*'I didn't realise there are so many careers to do with science. In the future I think I might consider having a career in science.'*

*'There are loads of science careers that I'll be looking at in the future. This has helped me decide what I want to do as a job.'*

For this student seeing the range of careers made her think about science in a different way:

*'I have learnt that in science there are so many career options. It makes you look at science in a different way.'*

The accompanying teachers voiced similar feelings as the students:

*'It has introduced them to a wide variety of careers in science - particularly with things that affect the students themselves. Most students were not aware of everyday things which involve science.'*

*'They have learnt that science is in many careers and doing science gives them lots of options. It made it more real by meeting real people.'*



**6% of students commented on how Skirting Science provided an insight into what's involved in various science careers:**

*'It helped me find out about the different types of careers and what is involved in them.'*

The workshop providers did a good job telling students about their careers:

*'I learnt about what the workshop providers have done, what they do every day and why they do it.'*

*'I liked finding out how people came to get where they are - it really helps to know how many options there are.'*

Having these first hand accounts helped this student clarify what occupation she wants:

*'Being able to see what people do for their jobs was good because it gave me some ideas for occupations that I probably wouldn't have considered.'*



**13% of students found out about various progression routes into science careers.** A lot of these comments related to GCSEs and A-levels:

*'I learnt what GCSEs, etc you must take. It is useful as we now know how to get into a career in science.'*

*'I have learnt what qualifications I need and what job I could do. This will help me make a more informed decision.'*

Some students went on to explain how this knowledge would be useful:

*'I have found out how to get a career in science and what qualifications I need. This will be useful when choosing A-levels in the future.'*

*'I learnt about what A-level subjects and GCSEs are needed for certain jobs. This would be useful when I consider what I want to do in and out of school in the future.'*

This student learnt about progression routes into a particular career she's interested in:

*'I've learnt what I need to do to achieve a medical job.'*

Some of the accompanying teachers commented on how their students had learnt about progression routes:

*'Chemistry of perfume was well organised and practical. The speakers pitched it at the right level and talked about their own pathways into science.'*

One teacher was impressed with how the opening speaker informed students about ways in to science careers:

*'They have learnt what it takes to enter a career in science. Dr Preeti Kaur was an excellent speaker to help with this. This will now make students consider their pathway into a science career.'*

**3% of students found out generic information about science careers.** For one student this information challenged misconceptions she had about science careers:

*'Science isn't just paperwork and staying in a lab, there are more activities involved.'*

Two students were excited by the prospect of travel that some science careers offer:

*'I learnt that there are loads of opportunities to do different things when you study science, like travelling abroad to research things.'*

*'I would like to consider a future career in science as it means that you can travel to lots of places and help the world to understand what is happening.'*

**8% of students were surprised to find out science is involved in so many different things.** These students realised science is involved in most things:

*'Science is part of your day to day life, even if you don't realise it!'*

*'I realised that there are more jobs that involve science than I previously thought. It makes me aware that science really is involved in most things.'*

*'It has definitely changed my opinion; I didn't know that so many different things were to do with science. I learnt that it's a valuable skill to have in any job.'*

One student went a bit further:

*'Science is part of everything, even making cider!'*

This teacher was impressed by how the workshops made science seem relevant to the students lives:

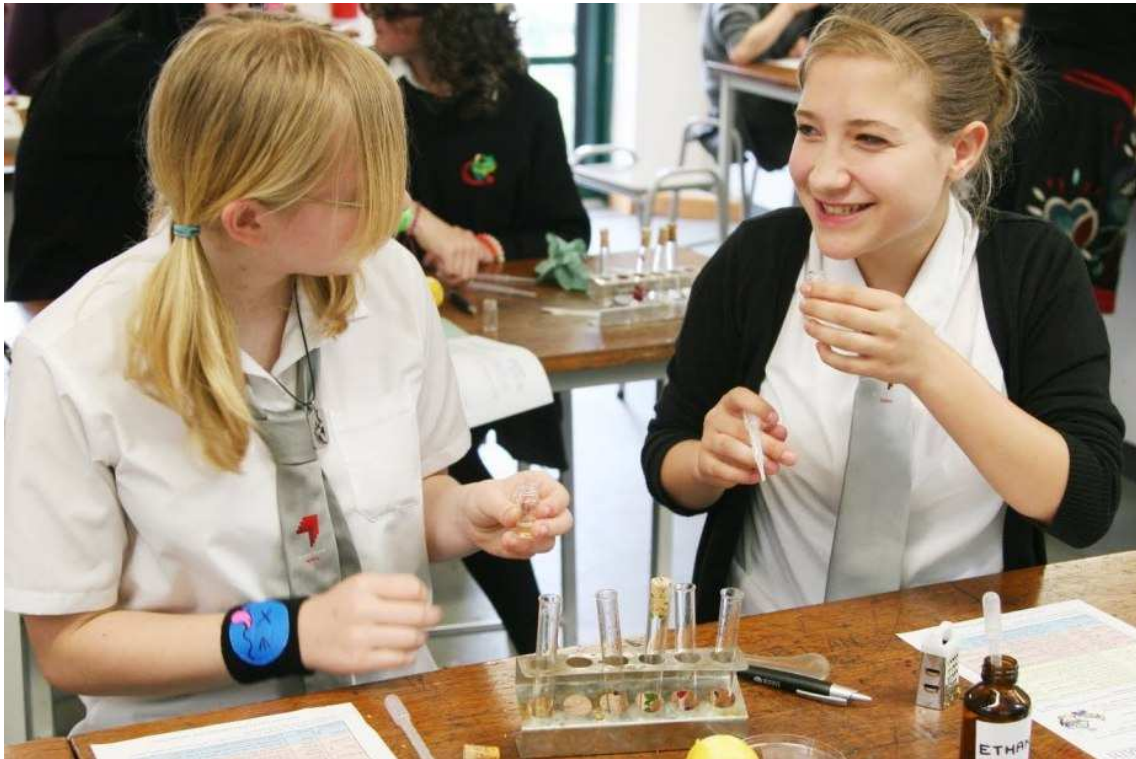
*'It helped them understand that a lot of things in their lives involves science, resulting in an increase in interest, i.e. perfume making is chemistry.'*

**11% of students talked about new subject knowledge they'd learnt:**

*'I learnt technical names for parts in the respiration system, the structure of the eye and how to measure for a pair of glasses.'*

*'I learnt how to communicate to a robot to get it doing what I want and how an engine works. It will help me if I have a career in engineering.'*

*'I have learnt about the eye and that we have a blind spot. Also I have learnt about a variety of science careers and how to get into them.'*



**Objective 2: To positively change student's attitudes towards science and science careers.**

The organisers of Skirting Science wanted to show the girls that science and science careers can be interesting and rewarding. To achieve this they gave students the opportunity to talk to science professionals and try the careers for themselves. This wasn't a public relations exercise; it was about presenting science careers as they are and letting the girls make up their own minds.

So did Skirting Science achieve this objective? 94% of the students who attended Skirting Science made comments suggesting their attitudes towards science and/or science careers had positively changed in one or more ways. Undoubtedly this objective was achieved.



**33% of the students thought science was more fun or interesting as a result of attending Skirting Science:**

*'Skirting Science has made me enjoy science even more than I did before. It had this affect because the practical's we did were fun and everyone took part.'*

*'Skirting Science has made me enjoy science more. It has made science seem more fun.'*

*'It made me more interested and it has made me want to get more involved in science. I think science is more fun.'*

*'I like science more now as the activities I've done are fun and interesting.'*



This student found this fun side to science alerted her to how rewarding a career it could be:

*'It has taught me more about science and shown that there is a fun side to learning. I now know how much you can get out of having a scientific job.'*

These changes in perception seem to be down to a number of factors including taking part in engaging activities during the workshops, everyone having the chance to take part in practical and, as the following student pointed out, the workshops being run by science professionals:

*'It made science more interesting because the people teaching us had those jobs.'*

**20% of students said they were now more likely to consider a career in science as a result of attending Skirting Science:**

*'I now know that science careers are open for lots of people and I think it's a lot more likely I'll do something linked to science in the future.'*

Others were persuaded because science, as it was presented, was fun and interesting:

*'It has made me think that science can be fun, not just working in books. It has made me think more about options for a career to do with science.'*

*'Skirting Science has shown me the other side of science and it's easy to enjoy. It has changed my attitude to a science career.'*

*'It made me want to take a career in science because it's fun.'*

*'It has made me want to have a career in science more because it's been really interesting.'*

A number of students commented they would now consider a career in science because of the range of jobs available. Presumably some of these jobs appealed to them, although they didn't say so explicitly:

*'I think I will consider a career in science now because I didn't know there were so many things I could do.'*

*'My attitude has changed and made me consider a career in science and has shown me the variety and range of jobs.'*

This student found having the time to explore different career options allowed them to discover what interests them:

*'I realised what I'm interested in and I would like to do it for my career.'*

Others saw science in a different, more positive light and as a result were now considering a science career:

*'I became more open minded towards science. I'm even thinking about having a future career in science.'*

**7% of students said Skirting Science helped them decide on a specific career in science they would to pursue.** One student went on to explain what it was about Skirting Science that helped her make her decision:

*'I already wanted a career in science, but after the workshop 'Genes in a Bottle' I have been steered towards biochemistry. It had this effect because the scientists were so enthusiastic it rubbed off on me.'*

The information, advice and guidance provided by the workshops helped these students decide on their career paths:

*'I wanted a career in science, but I didn't know what area to choose. Skirting Science has helped me decide what I enjoy and what I would like to do.'*

*'I am now considering a career in medicine instead or veterinary science, because I have lots of information on it.'*

*'It has made me more motivated and I now know what I have to do to get into medicine. They told us in a fun and interesting way and it was clear.'*

**4% of students felt they could achieve a science career after attending Skirting Science:**

*'It has made me realise that I can get a career in science if I wish. It will encourage me to consider a career in science.'*

*'Skirting Science has boosted my confidence into thinking about having a future science career.'*

*'It made me feel like it was possible to now have a career in science.'*

*'It has made me realise that I can get a career in science if I wish. It will encourage me to consider a career in science.'*

**7% of students had their conceptions of science being a career for males challenged:**

*'I think this has changed my attitude because I now know there's a huge range of science related careers for girls.'*

*'It made me realise what jobs women can do related to science.'*

*'Science isn't just for boys and can be fun.'*

*'It has given me more information about future careers in science and shown me that women can get jobs just as easily as men.'*

*'Skirting Science has helped me see it's not just boys who can enjoy science or have a career in science.'*

**The attending teachers noticed the change in student's attitudes towards science and science careers. One teacher thought the introduction made science seem less 'geeky':**

*'The introduction by Preeti Kaur helped them realise scientists aren't all geeks and nerds. Science isn't just school stuff.'*

Another teacher thought Skirting Science showed a more exciting side to science:

*'Skirting Science has shown them how exciting science can be. They now appreciate the variety of careers that science can lead to and thoroughly enjoyed the hands on experiences. A really positive experience for all the girls.'*



This teacher thought the enthusiasm of the workshop providers and the hands on nature of the activities was responsible for inspiring her students:

*'Skirting Science seems to have inspired the girls due to the enthusiasm of the workshop leaders and the interesting hands on experiences.'*

A couple of the teachers noticed how Skirting Science had helped their students see the importance of science and science qualifications:

*'Pupils were able to realise the variety of careers or areas that involve science skills shown by the various workshops and talks. This has helped them realise how important science, maths and engineering are.'*

*'Pupils have realised the importance of gaining science qualifications to leave their options open. Pupils showed enthusiasm for the ideas presented to them.'*

## **Conclusions**

The comments from students and teachers who attended Skirting Science 2011 consistently indicate awareness and attitudes have been raised. This lends support to what evaluations from the first two events have already suggested – the Skirting Science model is effective.

Specifically comments from students indicate that learning outcomes for them include:

### Awareness of science careers

- There are a wide range of science careers, not just lab workers and doctors.
- What it's like to work in some of these careers.
- Various progression routes into science careers.
- What science professionals enjoy about their careers.
- Generic information about science careers, e.g. opportunities for travel.
- New subject knowledge, e.g. technical names for parts in the respiratory system.
- That science is involved in many different things.

### Attitudes towards science and science careers

- Science can be fun and interesting.
- Students are more likely to consider a career in science.
- Helped them decide on a specific science career goal.
- Increased confidence that they can achieve a career in science.