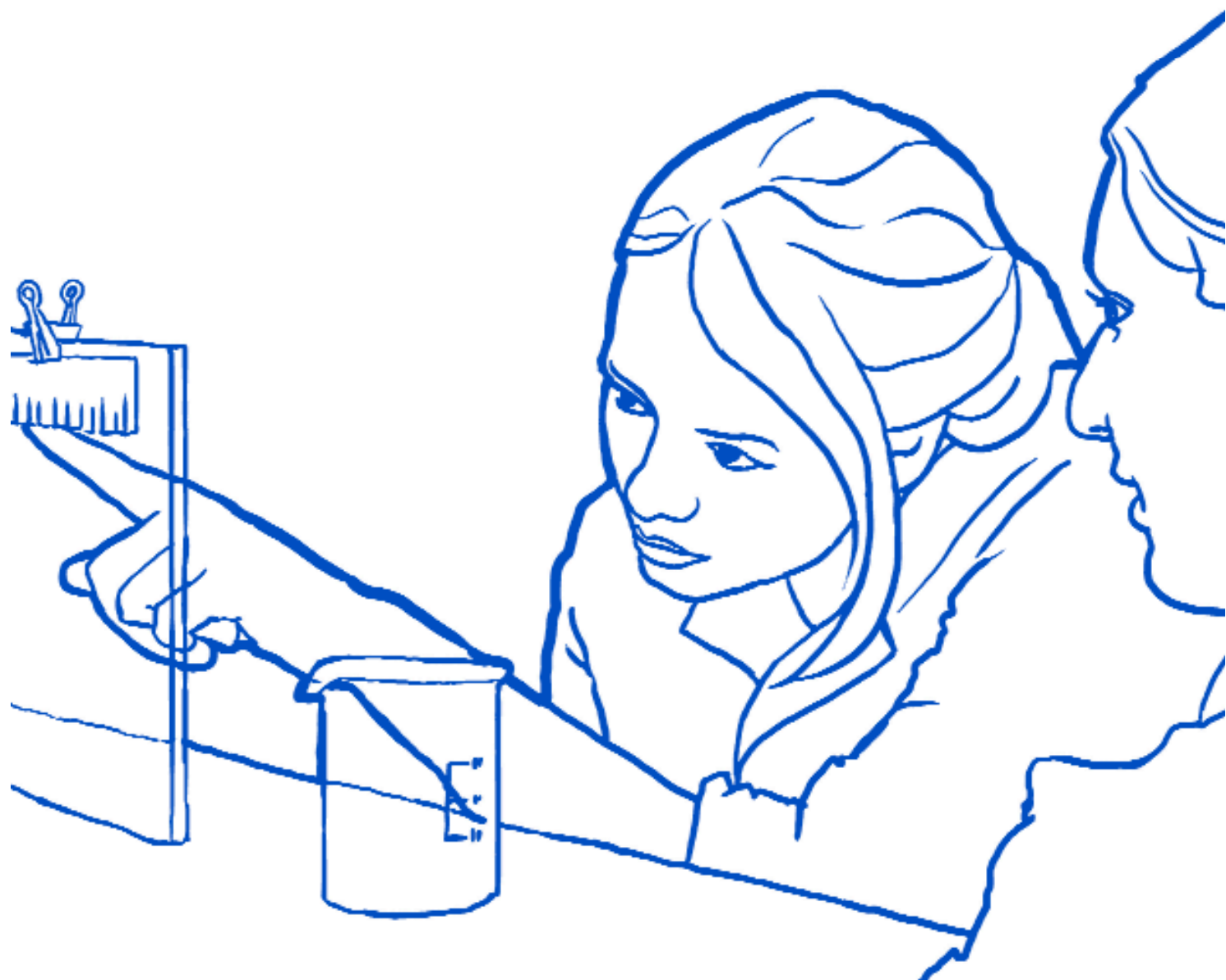


SET-Routes

# *Highways into Science*



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## SET-Routes Ambassador Training

EMBL Heidelberg, 11 May, 2007

# Programme

**9:00-9:20** Introduction to the School Ambassador Programme

**Rolf Landua (CERN)**

**9:20-10:20** Working with schools/ ambassadors at work

**Dr. Barbara Tigar , SETpoint Lancashire SETNET (UK)**

**10:20-10:30** Group photo

**10:30-10:50** *Coffee break*

**10:50-11:20** Working with schools/ ambassadors at work  
(continuation)

**Dr. Barbara Tigar, SETpoint Lancashire SETNET (UK)**

**11:20-11:50** Being an ambassador

**Dr. Karen Rickers-Appel, Ambassador Pallas Athene-DESY (Germany)**

**11:50-12:20** Talking to teachers

**Friedlinde Krotscheck, IGH (Germany)**

**12:20-12:30** Science in School-a journal for teachers

**Eleanor Hayes, EMBL (Germany)**

**12:30-13:30** Lunch

**13:30-13:50** Being an ambassador

**Dr. Sarah Dennison, Science and Engineering Ambassador (SEA) SETNET  
(UK)**

**13:50-14:35** Gender awareness in working in schools

**Jill Collins, Sheffield Hallam University (UK)**

**14:35** *Coffee break*

**14:55-15:50** How to get your message across-Basic  
communication skills

**Joan McCormack, University of Reading (UK)**

**15:50** Closing remarks

**Rolf Landua (CERN)**

# Introduction to the Guidelines

The objective of these guidelines is to provide you with some basic information that will help you support your activities as ambassadors.

These guidelines are partly an adaptation of the good practice guide "*Taking a leading role*" published by the Royal Society (2004), which you can find under the following link <http://www.royalsoc.ac.uk/page.asp?id=2785>.

They also contain advice supplied by SETNET, UK to their science and engineering ambassadors (SEAs) <http://www.setnet.org.uk>.

SET- Routes is a project financed by the European Commission under the 6th Framework Programme ([www.set-routes.org](http://www.set-routes.org)).



## Why SET-Routes ?

*Europe needs more scientists!* is the title of a report from an EU working group that addressed the condition of science and technology in the European Union, paying special attention to the number of people entering Science, Engineering and Technology (SET) education and careers ([http://ec.europa.eu/research/conferences/2004/sciprof/pdf/final\\_en.pdf](http://ec.europa.eu/research/conferences/2004/sciprof/pdf/final_en.pdf)). The report title reveals the key issue: the falling recruitment of students to many SET study programmes is seen as a major problem in most European countries.

There are interesting and significant differences between the European countries in terms of the number of students moving into further education and careers in SET, and the public perception of SET. Interesting results can be gleaned from the Eurobarometer surveys. These studies monitor European citizens views, values and attitudes related to many aspects of society. The Eurobarometer survey on SET indicates a widespread respect for, and belief in, SET issues. However, the interest scores are not the same for boys and girls. While girls express more interest in medicine and environment, boys are more interested in technology (<http://ec.europa.eu/research/press/2001/pr0612en-report.pdf>).

An interesting result from the most recent Eurobarometer on SET (EU 2005 - [http://ec.europa.eu/public\\_opinion/archives/ebs/ebs\\_224\\_report\\_en.pdf](http://ec.europa.eu/public_opinion/archives/ebs/ebs_224_report_en.pdf)) is that the level of knowledge about SET in most European countries seems to be improving. It seems that 'the problem' is not a general decline in interest and respect for SET, as such, but rather a decline in the willingness to opt for SET-related studies and careers. Young peoples' interest in SET subjects has been in decline for a number of years.

Ultimately, Europe may be left facing a shortage of people with the right SET skills and knowledge to allow it to compete on a global scale. The number of females studying SET in Europe is variable and in certain countries the numbers are particularly low. Although women represent 56% of graduates in higher education in Europe, they are underrepresented in science (41%) and engineering (21%). They are less likely to progress to advanced research programmes, where they constitute 40% of all PhD students but only 36% in science and 21% in engineering ([http://ec.europa.eu/research/conferences/2004/sciprof/pdf/final\\_en.pdf](http://ec.europa.eu/research/conferences/2004/sciprof/pdf/final_en.pdf)). Of all academic positions, 31% are occupied by women but only 15% are in senior academic positions (*She Figures, 2006*), a number that is only increasing very slowly. To access a range of statistics which support the evidence that fewer young people are choosing to study SET subjects and follow careers in this domain, you might find the following websites useful:

[http://ec.europa.eu/research/science-society/pdf/she\\_figures\\_2006\\_en.pdf](http://ec.europa.eu/research/science-society/pdf/she_figures_2006_en.pdf)

[http://epp.eurostat.ec.europa.eu/portal/page?\\_pageid=1996,45323734&\\_dad=portal&\\_schema=PORTAL&\\_screen=welcomeref&\\_open=/&\\_product=EU\\_science\\_technology\\_innovation&\\_depth=2](http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,45323734&_dad=portal&_schema=PORTAL&_screen=welcomeref&_open=/&_product=EU_science_technology_innovation&_depth=2)

[http://ec.europa.eu/research/science-society/pdf/wist\\_report\\_final\\_en.pdf](http://ec.europa.eu/research/science-society/pdf/wist_report_final_en.pdf)

The situation in industry is even bleaker, where only 15% of all researchers employed are female. In *"Women in Industrial Research—a wake up call for European industry"* the authors state: "Women are the most obvious source for increasing the numbers of highly trained scientists, engineers and technologists, because this talent pool already exists and can be expanded". ([http://ec.europa.eu/research/sciencesociety/women/wir/pdf/wir\\_proceedings\\_en.pdf](http://ec.europa.eu/research/sciencesociety/women/wir/pdf/wir_proceedings_en.pdf)).

## Why role models ?

SET is an area of study and employment in which women have been underrepresented for decades, despite the fact that research indicates that there are no inherent differences between men and women's skills and abilities to study or work in this field. Science still seems to be perceived as a male domain. Despite the historical importance of women scientists, their contribution is not well represented in the school science curriculum, and examples cited in the classroom and in textbooks often have a masculine basis.

Research conducted by the Equal Opportunities Commission (EOC) in the UK suggests that children develop ideas about gender roles at a very young age, and these ideas are then reinforced by parents, teachers and the media. Role models can play a major part in challenging ideas that science and engineering are unsuitable for women.

Promotion of positive female SET role models and feminization of analogies is important. Research shows that young girls are more likely to opt for science or mathematics if they have been taught by a positive role model.

A survey of over 1000 scientists and engineers conducted by the Royal Society in the UK in 2004 showed that just over half (52%) had been influenced in their choice of career by a visit to a scientist's or engineer's place of work, and nearly a quarter (23%) had been influenced by a scientist or engineer visiting their school.



## SET-Routes objectives

SET-Routes aims to help dispel the stereotypes that keep women out of science, by taking you as role models into schools and universities to change the perceptions of women in science. It should also help to rekindle students' enthusiasm for science and illustrate (especially for girls and young women) that there are rewarding careers in science.

Being a role model is extremely important. You can make a genuine difference to the way young people think about SET. You can help change the 'wild hair, white coats and glasses' image of scientists that young people often have, and make science appear relevant to them. This is particularly important for increasing the number of women who go into science and engineering.

You can also gain valuable skills – for example, in communication and presentation.

### SET-Routes objectives:

- Show girls that traditionally dominated male sectors in SET actively welcome women as well
- Capture the interest of young people in science and engineering so that they consider it in a positive light.
- Attract more young people, and girls in particular, into SET degrees

## School ambassador activities

### What sort of activities are you going to do?

We expect you to talk to classes about, e.g. what it is like to be an engineer, biologist, physicist... your research, your career, your life, and other interesting topics.

### Pairing you with a school

We expect you to go back to schools in your home country, e.g to your old school and other schools in this region.

We suggest you contact your school directly. If you do not have contact with your old school or it is difficult to find a school please contact the SET-Routes administrator.

### Preparing for your visit

#### Talk with the teacher

Think about you, your job, your life, the school and the people you will be meeting and speaking with and consider what kind of message you want to get over.

It is important to discuss your event fully with the teacher of the host school. Be clear on your time commitment and what you want to do, but try, at the same time, to be flexible and open to ideas from the teacher.

#### Know your audience

SET- Routes aims to target high-school children before they have decided on which field of study they are going to follow. This decision is made at different ages in different European countries. You will be working mainly with 12 to 15-year-olds. Take into account that this age group has little or no scientific knowledge.

#### Preparing for your talk

We expect each ambassador to talk for around 20-30 min about what it is like to be a scientist, engineer or technician followed by questions and a discussion.

Think about the young people that you will be working with and what expectations you have of the different age groups, and of different gender and ethnicity. Do you know what their level of knowledge will be? How do you expect them to behave? What sort of questions will they ask?

Be prepared: their questions may not all be about SET. Young people may ask you about your family, hobbies, your relationships, social activities, work environment, the car you drive, etc..

## School ambassador activities

### Tips for your talk

In preparing your talk, you might want to consider the following points and draft out answers:

- I am a ... and I do...
- Consider your work and your out-of-work roles, talk about what you do and what you enjoy
- What is your typical day like?
- What do you look like and what impression do you want to convey?
- What age group are you going to be talking to? Consider their interests and avoid stereotypes
- Think of examples that will be meaningful to your audience. Can you relate to a film targeted at this age group?
- What is fun/hard/easy/rewarding in your job?
- Do you have a family?
- Do you go out?
- What is it like being you?
- What made you decide to do the things you did? Don't be afraid to say it was an accident!

### Communication skills

- Try to be encouraging and positive without being patronizing
- Be sure to signal what you want to do in your talk (e.g. inform the audience that they can interrupt with questions or wait until the end)
- Introduce yourself from a bigger context and go from there to a smaller picture (e.g. I am a biologist, studying cancer, working with fish cells)
- Make sure to give the audience a structure of your presentation so that they know what to expect (e.g. inform them about the sequence of your talk)
- Tools to use during your talk: whole body speaking, pauses, different type of questions: closed, open, shared or rhetorical questions, summarizing questions (e.g. let me just put you through what you did...). Make polls (e.g. hold your hand up if you know the answer to...)
- Give the audience the feeling they are being listened to (tools: recap what the person said, nod to a person while they are speaking...)
- Relate your subject to the students' own experiences – e.g. to news stories, films, TV programmes, books, holidays, trips that some or all may have experienced

## School ambassador activities

- Make it interesting and varied-use visual aids (e.g. photos, diagrams, simulations, models, actual equipment or products), vary your style (e.g. give a brief introduction, then show some slides, then play a game or demonstrate a piece of equipment, possibly with the audiences' help, and finish with a brief quiz review of what you have covered)
- Make it human- use one or two stories that draw on your experiences, or those of others. Give examples of the everyday things you do
- Interact with student- ask questions to find out what students think or know, or to check if they understood something you mentioned earlier
- Check how long you have for your talk: schools lessons tend to end very promptly and you do not want to be cut off in the middle!
- Use appropriate vocabulary- don't make it over complicated or too simple. Introduce some new terms but explain what they mean. Avoid jargon and abbreviations

## Key points to remember

1

### Keep it broad and simple

Many young people can find science and engineering daunting, or off-putting. By keeping the appeal broad you are more likely to involve these young people as well as those who are already interested. It may not even be necessary to talk about SET. Placing activities in the context of problem solving and discovery—effectively turning the young people into detectives—can help.

2

### Be yourself

Young people tell us they like their role models to be enthusiastic, casually dressed and patient. The most important thing is to be yourself: young people can tell if you are genuinely passionate about your subject and about sharing your passion with them. They'll lose interest quickly, if they think you are 'putting on an act'.

3

### Science is teamwork

Show you work with different people. Science is teamwork. Take along pictures of colleagues. You might also want to do a small movie about your typical day to show to the class during your talk. They will get to know your workplace and colleagues. Ask the SET-Routes administrator if there are images that you can use and if you need help making a film about your typical work day.

4

### Be prepared

Prepare yourself for the awkward questions that you are likely to be asked. For example 'How much do you earn?' is a common one. You could respond with: 'Well, if you were to start at junior level you might be on...then you could expect to earn... It's a well paid career compared to...' You can always bounce the question back: 'What do you think I should be earning?'

5

### Talk about yourself

Some young people are more interested in status, some in money and others in neither. But they will be interested in you, what you find interesting about your job and what you have achieved through it. Don't wait to be asked these kinds of questions, make them part of any talk you give.

6

### Relate your science to everyday life

Connect your talk to the wider world of young people by linking them to real debates in which they are likely to be interested, for example, GM foods or the sexual selection of embryos. You can also relate your talk to TV programs, to products, technologies or activities that young people are likely to be familiar with or enjoy (e.g. mobile phones, computers, music) or to the local area, e.g. specific environments or industries.

## Evaluation

Feedback is very important to us, it will help to improve the programme and evaluate the feasibility of a possible follow-up project. The evaluation will require you to give feedback about the reaction of the young people to you and the activities you did. Feedback can be gathered informally through a chat with the teacher and/or pupils, or more formally through the forms at the end of these guidelines. Hand the forms to students and teachers at the end of the activity.

Your feedback about your experience as a SET-Routes Ambassador is also invaluable. We ask you to make a small report of your activity in the shape of a diary to which you can add photos or other documentation. If you would like to make any comments or suggestions-whether positive feedback or constructive criticism- we would be pleased to hear from you. Do not forget to send the forms and your activity diary to the SET-Routes Administrator. The best stories will then be hosted on the website!

The SET-Routes website will also give students the opportunity to ask questions to ambassadors. Inform your students of this possibility if you feel it appropriate.

Please send an email to the SET-Routes Administrator if you want to enter in contact and discuss your experience with other ambassadors. She will put you in contact with the other ambassadors.

The SET-Routes Administrator will be your first point of contact with the scheme. Please get in touch, if you have any questions or difficulties.

At the end of your period of school visits, you will have a review session with the SET-Routes Administrator. This session will serve to reflect on and evaluate your school events.

**SET-Routes Administrator contact details:**

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email: [info@set-routes.org](mailto:info@set-routes.org)

[www.set-routes.org](http://www.set-routes.org)



# Teachers' Feedback

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Name:

Address:

Email:

Telephone:

1) Do you feel the ambassador's visit has had a positive impact on your pupils?



2) In what way did the ambassador's visit influence your pupils? (Please tick all that apply)

Directly supported their learning

Improved their motivation/aspirations

Improved their career awareness

Helped them to link classroom work to real applications

Challenged their perceptions of SET

Other (please specify)

3) Do you feel the ambassador's visit had a positive impact on your capacity to enrich your pupils learning?



4) Were you satisfied overall with the ambassador's visit? Yes/No

5) Please feel free to comment on how the visit might have been improved.



Many thanks for completing this questionnaire!