Taking a Leading Role

A Good Practice Guide for all those involved in role model schemes aiming to inspire young people about science, engineering and technology.
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
<td>iii</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>iv</td>
</tr>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td>1</td>
</tr>
<tr>
<td>About this guide</td>
<td>1</td>
</tr>
<tr>
<td>Research methodology</td>
<td>2</td>
</tr>
<tr>
<td>Why are role model schemes important?</td>
<td>2</td>
</tr>
<tr>
<td>The importance of role models for girls</td>
<td>3</td>
</tr>
<tr>
<td>The importance of role models for minority ethnic communities</td>
<td>3</td>
</tr>
<tr>
<td>Gaps for developing role model schemes</td>
<td>4</td>
</tr>
<tr>
<td><strong>FOR SCHEME ORGANISERS</strong></td>
<td>5</td>
</tr>
<tr>
<td>Set-up and planning</td>
<td>6</td>
</tr>
<tr>
<td>Defining scheme objectives</td>
<td>6</td>
</tr>
<tr>
<td>Different types of schemes</td>
<td>7</td>
</tr>
<tr>
<td>Involving all the key people</td>
<td>7</td>
</tr>
<tr>
<td>Working with existing schemes</td>
<td>8</td>
</tr>
<tr>
<td>Diversity awareness</td>
<td>8</td>
</tr>
<tr>
<td>Start small</td>
<td>9</td>
</tr>
<tr>
<td>Resources for activities</td>
<td>9</td>
</tr>
<tr>
<td>Set-up and planning checklist</td>
<td>10</td>
</tr>
<tr>
<td>Communication</td>
<td>11</td>
</tr>
<tr>
<td>Managing expectations</td>
<td>11</td>
</tr>
<tr>
<td>Ongoing communication</td>
<td>12</td>
</tr>
<tr>
<td>Networks</td>
<td>12</td>
</tr>
<tr>
<td>Branding</td>
<td>12</td>
</tr>
<tr>
<td>Communication checklist</td>
<td>13</td>
</tr>
<tr>
<td>Evaluation</td>
<td>14</td>
</tr>
<tr>
<td>Event feedback</td>
<td>14</td>
</tr>
<tr>
<td>Achievement of objectives</td>
<td>14</td>
</tr>
<tr>
<td>Evaluation by role models</td>
<td>16</td>
</tr>
<tr>
<td>Evaluation checklist</td>
<td>16</td>
</tr>
<tr>
<td>Recruiting and working with role models</td>
<td>17</td>
</tr>
<tr>
<td>Recruitment</td>
<td>17</td>
</tr>
<tr>
<td>Desired qualities</td>
<td>20</td>
</tr>
<tr>
<td>Training</td>
<td>22</td>
</tr>
<tr>
<td>Ongoing support</td>
<td>24</td>
</tr>
<tr>
<td>Incentives</td>
<td>26</td>
</tr>
<tr>
<td>Role model checklist</td>
<td>26</td>
</tr>
<tr>
<td>Activities</td>
<td>27</td>
</tr>
<tr>
<td>What captures interest?</td>
<td>27</td>
</tr>
<tr>
<td>Key points to remember</td>
<td>28</td>
</tr>
<tr>
<td>Practical considerations</td>
<td>30</td>
</tr>
<tr>
<td>Supporting media</td>
<td>30</td>
</tr>
<tr>
<td>Activities checklist</td>
<td>31</td>
</tr>
</tbody>
</table>
From Sir Magdi Yacoub FRS, Chair of Steering Group

Science, engineering and technology (SET) affect each of us every day in some way. Helping young people to value the contribution of SET to their lives and engage in meaningful debate hinges on those of us in the profession being able to communicate and convey our knowledge and understanding with energy and passion. Inspiring young people to take part in the discovery and delivery of science is important for their health and well-being and critical for the continued success of our economy.

I believe we must do everything we can to raise the quality of young people’s engagement with science in school and in society. This Good Practice Guide is concerned with just one of the many ways in which this may be achieved – through role model schemes. In producing this guide we have worked with social scientists, young people, teachers, role models and people who run and deliver schemes to put role models into contact with young people.

During the research for this guide we questioned 157 young people who had just taken part in some kind of activity with SET role models about its effect: 41% said that they were not planning to study science or engineering before their involvement but that now they might (with 28% saying they were going to study science or engineering anyway). Over 1000 scientists responded to a web survey about what influenced them: 29% indicated that their parents had a strong influence on their career choice with three quarters of those parents being scientists or engineers themselves. The same survey showed that 22% of respondents had been influenced by a teacher.

In particular we wish to see many more girls and ethnic minority students being inspired to become scientists. The UK, along with the rest of Europe, sees a skills shortage as we increase our expenditure on research and development. Increasingly employers, who are driven by the needs and demands of their consumers, half of whom are women and all from a variety of cultural backgrounds, wish to have a more diverse workforce to develop relevant, innovative products for their markets.

It is difficult to assess the direct impact of any particular event in guiding young people to choose any one career path. It is clear from the many discussions that have taken place during the research phase for this guide that many scientists have been influenced by one or more scientists or engineers. It is also clear that many are engaged as role models, whether intentionally or not. I am sure that this guide will go a long way to sharing experiences, ideas and good practice.
Acknowledgements

The research and production of this good practice guide was undertaken with the guidance of a steering group drawn from a wide cross-section of sectors and expertise. Thanks are due to:

Helen Collier (Let’s TWIST), Joanna Edwards (NESTA), Sarah Gibbons (DfES), Caroline Isaac (IBM), Pat Langford (DTI), Tanniemola Liverpool (University of Leeds), Sean McWhinnie (Royal Society of Chemistry), Michael Reiss (Institute of Education, University of London), Yvonne Baker (SETNET), Liz Rasekoala (African-Caribbean Network for Science & Technology), Yasmin Valli (Leeds Metropolitan University) and Magdi Yacoub, Chair (National Heart and Lung Institute, Harefield).

This guide was researched and written for the Royal Society by Jude Cummins, Diane Beddoes, Phil Copestake and Carl Mclean of the Office for Public Management (OPM®). They can be contacted on 020 7239 7800 or jcummins@opm.co.uk

The project was managed by Caroline Ingram (CSI Consultancy), Ginny Page (Royal Society) and Jan Peters (Royal Society).

We would like to thank people involved in the following schemes who gave up their time to take part in the research used to inform this good practice guide. Contact details are available via the weblinks listed in the resource section at the end of this guide.

- Birmingham Ishango Science Club
- Brighton Science Alliance
- Construction Ambassadors
- CWEST (Cornwall Women in Engineering, Science and Technology)
- INSPIRE (Innovative Scheme for Post-docs in Research and Education)
- Let’s TWIST (Train Women in Science, Engineering, Construction and Technology)
- EPSRC’s NOISE (New Outlooks in Science and Engineering) campaign
- Pimlico Connection
- PSEP (Primary Science Enhancement Programme)
- Regent College
- Researchers in Residence
- SEAs (Science and Engineering Ambassadors)1
- SeeK (Science and Engineering Experiments for Kids)
- UAS (Undergraduate Ambassadors Scheme)
- Why Not Chem Eng?
- WISE (Women Into Science and Engineering)
- Wolverhampton RESPECT Festival

Thanks are also due to the following schools and schemes which provided images for inclusion in this guide.

- Ballycastle High School, RinR Express Yourself Finale 2004
- Jon Chlebik © 2004: Imperial College London
- Morecambe High School, Royal Society Partnership Grants
- NOISE, Planet Science
- SETNET

Designed by Franziska Hinz at the Royal Society.
INTRODUCTION

About this guide

A role model scheme, for the purpose of this study, has been defined as ‘an initiative seeking to promote science, engineering and technology (SET) to young people by intentionally promoting SET practitioners as positive role models’. The use of role models is often cited as being an important tool to inspire young people, and there are many schemes around.

This work was commissioned by the Royal Society, supported by the National Endowment for Science, Technology and the Arts (NESTA) and funded by the Department for Education and Skills (DfES), to understand what makes a good scheme and to share insights into how such schemes can be improved to better engage young people, especially girls and those from ethnic minority backgrounds, in SET.

This guide is based on extensive research with participants in 16 schemes chosen to explore national and regional case studies. Work has involved observations of events and discussions with scheme organisers, teachers, role models, young people and other stakeholders. Methods used included the gathering of views through individual interviews, group discussions and questionnaires from 25 people involved in running schemes, 20 teachers, 30 role models and over 150 young people who were taking part in role model programmes.

In addition, a web-based survey of over 1,000 SET practitioners was carried out to gain an insight into the influences on their career choice. Further information about this study is available from the Royal Society’s website at www.royalsoc.ac.uk/rolemodels

The research shows that role models can make SET seem more exciting, interesting and relevant. They can challenge persistent stereotypes – particularly of SET being mainly for boys or super intelligent beings. They can also help teachers add value to their science lessons and youth group leaders enrich their activities.

The information we have collected has enabled us to get an idea of what works and what doesn’t; to find out what scheme organisers, role models and teachers would do differently with the benefit of hindsight; and to collate useful resources for others setting up or becoming involved in schemes. This guide brings this information together in a series of chapters highlighting things to consider or to avoid, offering good practice tips, and signposting additional resources.

There are three colour-coded sections to this guide for:

- **scheme organisers** – if you are already running a scheme or thinking about setting up a scheme;
- **role models** – if you are a practising scientist or engineer who would like to get involved in a scheme;
- **schools and teachers** – if you are already involved in a scheme or thinking about becoming involved. This section would also be useful for community groups.

Each section has a number of chapters addressing different issues.

Look out for the following boxes to locate good practice tips, case studies, sources of information and checklists.

**Good Practice Tip**

- > practical ideas from experienced scheme organisers

**Case Study**

- > real examples of successful strategies

**Checklist**

- > helpful summaries of key things to remember

**Further Information**

- > where to go for more advice
Typology of role model programmes

<table>
<thead>
<tr>
<th>Duration of contact</th>
<th>One off</th>
<th>Fixed period</th>
<th>Ongoing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of contact</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No personal contact with role model</td>
<td>Posters, television, videos, more limited websites</td>
<td>Video series, CD-ROMs</td>
<td>Magazines, newsletters, more substantial (frequently updated) websites</td>
</tr>
<tr>
<td>Indirect contact with role model (email, letter etc)</td>
<td>Web-based question forums</td>
<td>Mentoring relationship</td>
<td>Mentoring relationship, website profiles that allow students to contact the role models</td>
</tr>
<tr>
<td>Direct contact with role model (face to face)</td>
<td>SET events (competition, fair), visits (by practitioner to school or by students to workplace), lectures/presentations</td>
<td>Mentoring relationship, work experience, residential events</td>
<td>Mentoring relationship, ambassador schemes (practitioners providing support in schools)</td>
</tr>
</tbody>
</table>

A series of photocopiable resources and a list of contacts for existing schemes and organisations mentioned throughout the guide are given at the back of this report.

Research methodology

A literature review of existing evidence of good practice and a mapping exercise of current schemes that intentionally promote SET practitioners as positive role models, undertaken for this report, are available on the Society’s website. From this work we drew up a typology of role model schemes (see above), which looks at two dimensions: duration of contact and level of contact. To ensure that the good practice guide has wide applicability, the schemes selected as case studies were chosen to include a mix of these different types.

The selection also includes schemes that:
* operate on different levels – nationally, regionally and locally;
* are aimed specifically at pupils from Black and other ethnic minority backgrounds or specifically at girls, as well as universal schemes;
* work with children of primary school and secondary school age.

Why are role model schemes important?

In recent years, considerable attention has been paid to the quality of education and training that young people receive in SET, and more specifically to how young people’s aspirations and achievements in this area are affected by their exposure to SET. There has been little direct research on role model programmes and their impact, although mentoring programmes are more rigorously reviewed.

As part of its strategy for improving the UK’s productivity and innovation, the Government commissioned Sir Gareth Roberts to review the supply of scientists – people with science, engineering, technology and mathematics skills. Many of the findings of the review demonstrate, and often refer specifically to, the importance of positive SET role models in enhancing SET education both within and outside schools.

A key finding of Roberts’ review was that there was a ‘disconnect’ between the growing demand for graduates in highly numerate subjects such as engineering, mathematics and the physical sciences, and declining numbers of graduates in these areas.
Significantly fewer pupils are choosing to study mathematics and the physical sciences at A-Level, in a period when total A-Level entries have risen. Roberts noted that practical work has a crucial role to play in improving pupils’ knowledge and understanding of SET, and in enthusing them to study SET subjects at higher levels. Many schools have found that by inviting university students into the classroom to assist the teacher they can greatly enhance the quality of practical sessions.

In addition, research has revealed that primary school teachers had less confidence about teaching the physical processes and experimental investigation strands of science than they had about teaching the life and living processes strands. Research conducted to inform this good practice guide indicates strongly the benefits that visiting practitioners (role models) can bring in terms of enhancing and supplementing teachers’ knowledge.

The literature review notes several other factors that affect pupils’ SET learning experiences. Pupils’ enthusiasm for SET subjects within the school environment can be boosted outside the classroom as well as inside it, through visits to businesses involved in science and engineering and by taking part in open days and taster sessions at museums, colleges, universities and other organisations (which will often involve the participation of SET practitioners).

Research also highlights the fact that pupils tend not to make links between school science and future careers. The role model function of SET practitioners therefore has a dual aspect: presenting and communicating their work in a clear and engaging way, and highlighting the rewards and breadth of careers that can follow from studying science and engineering.

As part of this study we questioned 157 young people who had just taken part in some kind of activity with SET role models about its effect: 41% said that they weren’t planning to study science or engineering before their involvement, but that now they might (with 28% saying they were going to study science or engineering anyway).

The importance of role models for girls

SET is an area of study and employment in which women have been under-represented for decades, despite the fact that research indicates that there are no inherent differences between men’s and women’s skills and abilities to study SET or work in this field. Research conducted by the Equal Opportunities Commission (EOC) 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 the stereotype of science and engineering being unsuitable for women.

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. Promotion of positive female SET role models and feminisation of analogies is still important. Research shows that women are more likely to lean towards the sciences or mathematics subject options if they have been taught by a positive female role model.

The importance of role models for minority ethnic communities

Research into perceptions of scientists and engineers shows that children largely perceive such individuals to be White males, and that more work is needed to avoid tokenism and promote images of practitioners from ethnic minority backgrounds in senior posts. The research conducted to inform this good practice guide confirmed that this stereotype is still prevalent.

Whilst no ethnic group is inherently less capable of academic success, the inequality of attainment is a significant and persistent problem for many minority groups. Analysis of data from sources such as the Labour Force Survey, undertaken by the Warwick Institute for Employment Research (Warwick IER) as part of the Royal Society’s work on promoting diversity (www.royalsoc.ac.uk/diversity) provides a comprehensive picture of the involvement of the UK’s ethnic minority groups in SET fields; an extract is reproduced in resource 6 at the back of this guide.
It suggests that whilst both the UK’s Indian and Chinese populations are proportionally better represented (in comparison to the White population) in the SET workforce, and also in SET higher education, among SET A-Level students, Black Caribbean and Bangladeshi people are significantly less well represented: Black Caribbean males and Bangladeshi women are particularly poorly represented. The Black African population, on the other hand, is reasonably well represented in SET.

Recent qualitative research suggests that being inspired in science and maths subjects through teachers and role models is a key factor in ethnic minority pupils’ performance, enthusiasm and interest. However, scientists from ethnic minority backgrounds feature very little in UK science text books or materials.

**Gaps for developing role model schemes**

The 2004 DfES ‘Science technology engineering and maths (STEM) mapping review’ identified several deficiencies in the range of initiatives supporting the development of science and engineering graduates, including ‘the lack of promoting and mainstreaming women/girls and ethnic minorities in STEM’, and the need for better evaluation. Of particular importance is the recognition that initiatives seeking to show minority groups positively represented in SET professions are relevant to all young people.

---

**Notes**

1 Funded by the Department of Trade and Industry (DTI) and Engineering and Technology Board (ETB) and managed by SETNET and the SETPOINT network on their behalf: www.setnet.org.uk


6 Ibid.


9 Centre for Science Education (2003), Ethnicity and Underachievement in Science and Mathematics Education, a report to the Royal Society.
FOR SCHEME ORGANISERS
This section is written for people who are already running a scheme that brings young people into contact with practising scientists or engineers, or for people who are contemplating setting up a new scheme.

It’s easy to underestimate the amount of time that it takes to plan and set up a successful scheme. This chapter is designed to guide you through the various stages and to put you in touch with people already running a scheme.

**Defining scheme objectives**

The first question you need to answer is: who is the scheme aimed at? For example, are you targeting primary or secondary school age children? If secondary school, are you trying to: influence pupils’ choices regarding subjects to study; support and enhance learning in the classroom; change young people’s attitudes to science and scientists; increase engagement with topical science issues? Will your scheme aim to address the under-representation in SET of women or people from ethnic minority backgrounds in particular, or will you take an inclusive approach and ensure you have a variety of role models on your books?

You need to have clear and realistic objectives for the scheme and make sure these are followed through. For example, make sure your role model is able to work with different ability groups and has information and examples appropriate for that group. If the scheme is targeted at encouraging more women to take science degrees, then talks and activities surrounding this are unlikely to be interesting for girls who expect to leave school at 16. Involving the right young people can be difficult when you depend on a third party, such as a teacher, to select pupils; you need to build up a good relationship with the third party and check that he or she understands, and is happy with, the objectives of the scheme and who it is aimed at.

Possible aims and objectives of the scheme include to:

- interest young people from ethnic minority backgrounds in SET and encourage them to pursue a career in this field;
- show girls that careers such as engineering and construction can be rewarding for women;
- attract more able young people into SET degrees and/or Modern Apprenticeships;
- interest young children in science and engineering so that they may consider it as a positive career option.

While it is important to have clear, easily understood aims and objectives at the outset, these shouldn’t be too rigidly defined or followed in a way that prohibits natural growth or change as the scheme progresses. Keep these objectives in mind when you are planning your evaluation tools and questions and try to get them to tie up.

**Good Practice Tip**

Take account of the school calendar and when key decisions such as GCSE choices have to be made. There is no point, for example, running a scheme to encourage girls to take GCSE subjects such as ICT, design and technology and engineering if they have already made their choices – this often happens months before the GCSE course begins. A better time is to target them aged 11 and 12 as research shows they leave primary school with positive attitudes to SET.

**Good Practice Tip**

Think about accessing young people through a community group rather than through schools. This environment can offer better opportunities to stimulate those who struggle with formal schooling. It can also be a better way of reaching a particular ethnic minority group if you wish to target them exclusively. Try your local library, your council’s community development department, the National Association of Councils for Voluntary Service (www.nacvs.org.uk), the National Council for Voluntary Organisations (www.ncvo-vol.org.uk) or the Council of Ethnic Minority Voluntary Sector Organisations (www.emf-cemvo.org.uk). The General Teaching Council for England launched a race equality network in 2004 called Achieve (www.gtce.org.uk/research/achieve_intro_page.asp).
Consider involving young people and teachers in the planning stage, to find out what they really need. At the very least, try to leave some flexibility in the design of the scheme, so the activities or programmes can be tailored to individual circumstances.

**Different types of schemes**

You also need to decide what type of scheme you are going to set up. Some possibilities are:

- one-off events, either in schools or off site;
- publicity campaigns, such as posters and websites;
- site visits to SET companies or universities;
- residential schemes;
- websites;
- ongoing relationships with schools or community groups;
- ongoing relationships with individual pupils or groups of pupils.

If you are working with schools, making links to the National Curriculum (see www.nc.uk.net/index.html) in terms of timing, target age group and activities can make it easier for teachers to integrate the scheme into their planning and teaching.

Most existing schemes fall into one of the following broad categories:

- **Events** – an (often) annual, regional or sub-regional visit/event/festival centred on hands-on activity, with some overt promotion of role models (e.g. SeeK, WISE Outlook);
- **Networks** – a network of SET practitioners or university students, nationally and/or regionally co-ordinated, who visit schools and other groups in their local area on a reasonably regular basis, possibly as part of a formal course of study (e.g. Researchers in Residence, Why Not Chem Eng?, Undergraduate Ambassadors Scheme, Science and Engineering Ambassadors);
- **Publicity campaigns** – a national publicity campaign, involving the promotion of positive SET role models through a variety of means (e.g. RESPECT campaign, NOISE, Royal Society of Chemistry poster campaigns);
- **After-school clubs** – a locally run after-school club (possibly part of a national network), incorporating visits from SET role models, who may be members of network-type schemes (e.g. Birmingham Ishango, local Young Engineers Clubs).

Web addresses for all the schemes mentioned are given in the resources at the back of this guide.

**Involving all the key people**

Consider all the people who influence the choices young people make. In particular, the influence of parents is vital. In a survey of over 1,000 practising scientists and engineers, 29% indicated that their

**Good Practice Tip**

Consider involving young people and teachers in the planning stage, to find out what they really need. At the very least, try to leave some flexibility in the design of the scheme, so the activities or programmes can be tailored to individual circumstances.

**Good Practice Tip**

It is generally more effective to focus exclusively on SET subjects, and not dilute the message by combining the promotion of SET role models with the promotion of arts or sport.

**Case Study**

The Intech centre in Winchester (an interactive educational science centre: www.intech-uk.com) has teacher briefing days once a month. They also run in-service training (INSET) days, so that teachers can be exposed to the opportunities that SET has to offer and gain ideas for teaching science. This is felt to be particularly helpful to primary school teachers, who are often in the position of teaching science without necessarily having a background in that subject. Working with SETPOINT Hampshire, based in the centre, Intech invites new role models to the teacher briefing sessions as part of their training in understanding the school environment.
parents had had a strong influence on their career choice, with three-quarters of those parents having been scientists or engineers themselves. The same survey showed that 22% of respondents had been influenced by a teacher.

**Working with existing schemes**

When setting up a new scheme, or thinking about expanding an existing scheme, try to avoid duplication of existing schemes. If you have similar aims think about joining forces so you can, for example, cover more schools.

Most existing schemes are willing to help new people wanting to set up similar schemes. Contact the following organisations before you get too far along the road with your planning to see what help and advice they can offer:

- **Your local SETPOINT (contact details www.setnet.org.uk).** Many local schemes encourage their role models to become Science and Engineering Ambassadors (SEAs), often in order to take advantage of the SEAs’ training and Criminal Records Bureau (CRB) clearance. For local schemes, SETPOINT involvement and support can be very beneficial in persuading businesses and potential role models to take part.

- **The National Education and Business Partnership Network can provide support for:**
  - work experience;
  - mentoring;
  - visits to the workplace;
  - enterprise activity;
  - professional development for teachers.
  Their website (www.nebpn.org) includes lists of local contacts throughout England.

- **For role model schemes aimed at girls, contact the UK Resource Centre for Women in Science, Engineering and Technology (www.setwomenresource.org.uk) Helpline number: 01274 436 485.**

**Diversity awareness**

If you are running a universal scheme you need to make sure that your scheme is attractive to, and meets the needs of, boys and girls from all ethnic backgrounds. Think about this from the outset and make it central to the scheme, rather than an after thought. Women and people from ethnic minority backgrounds tend not to think of engineering or science as a default career choice for many complex reasons. Your scheme is a chance to redress this: the role models will show young people ‘I’m a scientist or engineer and you could be too’.

'It is important to get parents to understand what science is and that girls can do it – we need to take the prejudices away.' Role Model

**Case Study**

SETPOINT in Devon and Cornwall runs courses for teachers, to enhance their ability to use specific activities and to help them enthuse young people. The courses take place on employers’ premises, so that teachers can get a clearer idea of possible careers and involve role models as part of the course. Other SETPOINTs also run courses so contact your local SETPOINT by calling 020 7636 7705 (www.setnet.org).

**Good Practice Tip**

By involving parents in the scheme, you can strengthen messages about the attractiveness of careers in SET. You could invite parents to an introduction or end-of-programme event, send material home with young people or invite parents to take part in activities alongside the role models. Some parents will have a SET background themselves and could become role models in their own right.
When you are setting up or reviewing your scheme or materials ask yourself a few simple questions:

- Have I considered gender and ethnicity?
- What would this piece of material/activity say to me if I was from a minority group and/or female?
- What do your women (and men) role models believe are the opportunities for women in SET?

If you are unsure of the answers go and find some people from that group or community to ask. Start by contacting local community groups, recruit people from a local school or local employers to take part in a short discussion group, or contact people via one of the professional societies or learned bodies. Involving parents in schemes for young people from ethnic minority communities can be particularly useful.

Start small

- Start with a small scheme so that you do not overstretch yourself in the early days, as setting up is very time intensive. This is especially important if funding is limited. Consider carrying out a small-scale pilot before a larger roll-out.
- Focus on achieving high quality with a small number of young people/schools at the beginning to help iron out any difficulties. Once you are up and running, word of mouth recommendations will make it easier to get other teachers, schools and role models involved.

Resources for activities

Bear in mind the following things about resources for any activities that role models undertake (see chapter on activities for some ideas of the type of activities to run).

- If the activity is taking place on school premises or in a community centre does the venue have the resources necessary to deliver the scheme – e.g. construction materials, sinks.
- Other schools or community groups might be able to help – e.g. secondary schools providing teachers or lab resources for primary schools.
- Resources should be as teacher friendly as possible – e.g. primary teachers without science training should be able to use them if the role model is not going to be present the whole time.
- Materials should show a diversity of images in terms of men, women and those from ethnic minority backgrounds.

Case Study

The Birmingham Ishango Science Club (www.ishangohouse.com/ishangoScienceClubs.html) works with African-Caribbean young people and prides itself on placing parental involvement at the heart of the scheme, to ensure that the positive messages with regard to SET are not negated at home. As part of this involvement, some parents were recruited to conduct lessons during Black History Month.

Good Practice Tip

Sensitivity and fear of offending is not a reason to avoid being more diversity aware. If you are afraid of offending, ask how you should approach someone or behave.
SET-UP AND PLANNING

• Health and safety – have you checked the regulations on what experiments can be done and which materials used? The School Science Service (www.cleapss.org.uk) provides advice to subscribers on health and safety including risk assessment, sources and use of chemicals, and use of living organisms and equipment. Some guidance is also available from the Royal Society of Chemistry on chemicals that it is not advisable to use in school (www.chemsoc.org/networks/learnnet/cldemo.htm).

• Have you carried out a risk assessment? This is particularly important if the young people are going away from their normal environment or if hazardous chemicals or a hazardous procedure are going to be carried out as part of the activities with the role model.

• Do you have the necessary insurance cover? The insurance cover you need will depend on a number of factors such as whether or not you are taking young people out of school.

• If teachers have to be trained, you need to ascertain whether they will need supply cover back in school, and be prepared for them to ask how these costs might be covered.

☐ Set-up and planning checklist

☐ Are your objectives clear? Have you involved key groups in defining them?

☐ Are you clear what age group you are targeting and how this fits with the key decisions they will need to take about subject choices?

☐ Have you decided whether your scheme is to be targeted at all young people or specifically at girls or those from an ethnic minority background?

☐ Have you thought about accessing young people through community groups rather than through schools? This can be particularly effective at reaching young people from Black and other ethnic minority backgrounds.

☐ Have you contacted your local SETPOINT and Education and Business Partnership?

☐ Have you contacted the UK Resource Centre for Women in SET for help and guidance on training, materials and contacts?

☐ Does your scheme link into the National Curriculum and school year?

☐ Are you clear what resources you will need and who will provide them?

☐ Have you carried out a risk assessment? Have you checked that health and safety requirements will be met? Do you have insurance cover? Have you planned Criminal Records Bureau checks?
According to those interviewed during the research phase of this work, good communication with all involved is key to running a successful scheme. The stakeholder groups you will need to communicate with typically include:

- schools or community groups;
- role models;
- the organisations that the role models work for;
- parents of the young people involved;
- the young people themselves (although this may be indirectly through teachers, community group leaders or the role models themselves).

You may also need to include others such as Local Education Authority officers, careers advisers and organisations that are hosting site visits, such as businesses or universities.

All stakeholders will need to be clear about the objectives of the scheme, how it will operate and what is expected of them. Achieving this clarity is often time consuming, as there may be many different points of view about the desirability of different objectives and ways of operating. This is also often complicated by the fact that many schemes rely heavily on volunteers, who may have a very clear idea of the basis on which they want to get involved.

You will also need to ensure that there is good communication between the different stakeholder groups, such as the schools and the role models.

This chapter also looks at the importance of branding as a communication tool.

**Managing expectations**

All those involved in the scheme need to be clear about the objectives of the scheme and what is expected of them. It is particularly important that there is a good level of communication between the scheme organiser and any teachers involved. Scheme organisers who were interviewed found face-to-face contact invaluable in establishing a good relationship. Any uncertainties about the scheme and how it might operate can easily be discussed and ironed out in a face-to-face meeting.

If your scheme is ongoing (such as a role model visiting once a week) then you need to think about how to keep in touch regularly with the main parties to ensure that everything is going well. Where teachers are involved, discuss with them what type of contact they would prefer – given the tight timetables to which schools operate, many will find email contact easiest, or they might give you an idea of the times when they are not teaching and you can get them on the telephone.

In your initial discussions with schools, teachers and role models, make sure that there is mutual understanding and agreement on key issues regarding the type of scheme and division of

**Case Study**

The organisers of the Undergraduate Ambassadors Scheme (www.uas.ac.uk) discussed the possibility of changing the scheme’s name because of concerns that it sounded too official. However, owing to the high profile already established for the scheme, the organisers decided to counteract the official name with a new logo based on a popular ‘retro’ brand of trainer to promote a more appealing and accessible image:

**Good Practice Tip**

Make sure that everyone involved understands how his or her behaviour affects the scheme. For example, it is not helpful if a group of girls visiting a construction site are shown around by men who talk about ‘the lads on the site’ or make inappropriate jokes about the presence of women in a traditionally male environment. Have in place strategies to address this, for example, in post-visit debrief discussions.
COMMUNICATION

Ongoing communication

For long-running schemes, check regularly with all stakeholders that everything is running well. Encourage all those involved to get in contact with the scheme organisers if they want to talk about progress, difficulties, support needs or other issues. Review meetings can also be helpful.

Of the schemes reviewed many have a regular newsletter that is sent to all stakeholders – schools, businesses and role models. This helps in a number of ways, including:

- raising the profile of the scheme;
- recruiting of business support and role models;
- giving recognition of the support of businesses and role models, through articles and case studies in the newsletter;
- recruiting of schools and young people;
- rewarding young people through articles, case studies and photos in the newsletter;
- communicating with role models about up-coming events.

Similar objectives can be met through a regularly updated website, emails or stories in the local media. These types of communication can also be used to raise the profile of women and those from ethnic minority backgrounds working in SET, through interviews with the role models and other articles.

Networks

Many of those participating in a scheme will appreciate the opportunity to share experiences with others who are similarly involved. Think about how you can best create a network so that, for example, teachers from different schools involved in the scheme are in touch with one another.

Also think about who could help to spread the word about your scheme such as the local media, business organisations such as your local Chamber of Commerce, or education and business partnerships (see www.nebpn.org). A simple press release offering a description of the scheme, a couple of quotes from participants, an opportunity for journalists to attend an event and/or talk to those involved, and your contact details, will often yield good local newspaper or radio coverage.

Branding

Many schemes find having a clear, consistent brand name and logo very helpful in terms of:

- raising awareness;
- building credibility for the project;
- attracting funding;
- recruiting role models and business support.

I thought it was to do with something else – the name does not signify that it would be about science. Teacher

Good Practice Tip

Be as open and honest about what the scheme will not be able to achieve as about what you hope it will achieve.

Case Study

SETNET has a newsletter called SETPIECE, produced three times a year. It contains: write-ups of the activities that their SEAs have been undertaking, with photos of young people and role models in action; invitations for others to get involved in specific events; and reports from partner organisations. Some of the regional SETPOINTS also produce their own newsletter. You can view previous newsletters (www.setnet.org.uk).

Good Practice Tip

Informal communication, such as social events for role models and quick telephone calls to check that everything is going well, can be just as important as the more formal types of communication.
It is important that the brand is applied consistently across all types of communication to achieve these benefits. It is important that any images of scientists or young people used include men, women and people from a range of ethnic backgrounds.

It also helps if the name signifies the nature of the scheme and if the imagery appeals to young people.

The importance of consistent branding also extends to the values and objectives of the scheme. This might mean, for example, involving parents to ensure that positive messages about SET careers for girls are not contradicted at home. Another example is trying to ensure that those showing young people around sites give out appropriate messages.

A formal evaluation of the Why Not Chem Eng? scheme (www.whynotchemeng.com) found that one of the scheme’s strengths was its strong branding, which consistently ran through the website, printed and electronic guidance literature and promotional materials. The brand was seen as a strength because of the visual appeal of the ‘it’s a blast’ slogan, bright colours and stylised text to the target audience of 15-18 year olds.

**Case Study**

FOR SCHEME ORGANISERS

Are all stakeholders in agreement about the objectives of the scheme and how it will operate?

Is it clear who is responsible for what? For example, briefing role models about the activities, organising any transport for the young people, recruiting young people for the scheme, providing any equipment needed.

Have you thought about how you can involve parents in the scheme?

Are those involved with site visits well briefed about the scheme and appropriate behaviour?

Is it clear how stakeholders can contact you to report any difficulties or discuss issues that come up?

Does the scheme have a name and logo that are consistently used by all stakeholders across all media?

Do any images you are using show a diverse range of people in terms of gender and ethnic background?

Have you thought about informal communication as well as more formal communication?

Who can help spread the word about your scheme?
Considering your evaluation tools and techniques early in the design of your scheme will offer the best opportunity for understanding the impact of your scheme. It will certainly help you approach people for support and funding.

There is no doubt it is difficult to demonstrate the long-term effects of role model schemes, and to date there has been no large-scale longitudinal study, but individual schemes can gain much by carrying out small-scale evaluations of the immediate reaction to their schemes from all involved. This information can be used to improve future activities as well as to provide some indication of the success of the scheme. Indications of success are important in gaining support from funders and securing the involvement of more role models and schools. The guidance below concentrates on how you can gain this type of immediate feedback.

A survey of over 1,000 scientists and engineers 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.

However, the direct effects of role model schemes on the final career choice of young people are extremely difficult to measure, given the whole range of other factors that also affect career choices. It would also be necessary to conduct a longitudinal study to track the career paths of young people involved in particular schemes to measure their effect. It is unrealistic to expect individual role model schemes to undertake this type of evaluation, although several larger schemes have carried out more formal independent evaluations.

**Event feedback**

Using a simple questionnaire, collect feedback from young people at the end of a specific event to see what worked particularly well and what participants would like to be different. You can then make improvements next time. It is worth considering whether the feedback will be more honest, and therefore useful, if given in confidence, and who else might benefit from seeing the results of your evaluation, such as any teachers involved.

You should also gather feedback from the teachers or community group leaders and the role models themselves.

Whatever feedback you collect, review it when planning future events, to see what you could do better.

**Achievement of objectives**

While it is not possible to measure the ultimate impact of role model programmes on final career choice, you can measure whether the programme or activity has taken steps towards meeting its intended objectives (for example, if the objective of the scheme is to get...
more Black pupils into SET careers, are they more interested in this as a result of your scheme?). As we have seen, defining your objectives clearly is one of the key aspects to setting up a scheme. It is also crucial in terms of evaluation, as you can’t know whether you have been successful if you weren’t clear what you were trying to do in the first place!

There are many possible ways of measuring whether progress has been made towards the objectives:

- Carrying out a ‘before and after’ measurement, by asking the young people involved about their attitudes to science and engineering before their involvement in the scheme, and again at the end. This can be done through a simple tick-box questionnaire.

- Asking the young people to record what they have learnt as a result of the programme, for example: What surprised them about the role model? What are the key things they have learnt about working in science, engineering or technology?

- Comparing the subject choices of those involved in role model schemes with a similar group from a previous year.

- Handing out post-experience evaluation or ‘satisfaction’ questionnaires (for both teachers and pupils).

- Carrying out tests at the start and end of each term for those involved in after-school SET clubs, to see if their knowledge about SET and their attitudes to it have changed.

- Meeting with teachers shortly after visits to hear what the pupils have been saying about the scheme.

- Asking those giving careers advice if they have noticed increased interest in SET careers.

- Gathering electronic feedback, for example through a central scheme website.

Good Practice Tip

When asking participants to complete questionnaires, take the opportunity to ask them to indicate their interest in being involved in any follow-up activities.

Good Practice Tip

Having a feedback section on your scheme’s website can be a useful way of getting the views of young people. It is unlikely, however, that many will voluntarily log on to use this facility. Consider whether you can incorporate this into a session that you are running.

Case Study

Around six months after joining the scheme, the role models involved with the NOISE scheme (www.noisenet.ws) spend a day with the scheme organisers, giving feedback and discussing possible improvements. As the role models are spread throughout the UK, this also gives them the chance to swap experiences and share good practice with one another.
EVALUATION

Evaluation by role models
As scheme organiser, you may not be involved in the day-to-day activities of your scheme. Therefore you need to ask for regular feedback from role models – although providing this must not be overly onerous, as it could put role models off. Consider an incentive such as a free prize draw to encourage people to complete feedback forms.

Some schemes bring role models together for a feedback session and also use it as a networking and social event for the role models, to show appreciation for their work.

SETPOINT West Yorkshire devised an on-line evaluation tool, Quiet, to help evaluate events and specific SEAs programmes. The organiser (e.g. teacher) ranks a list of objectives provided by SETNET and adds any others. A cross-section of those involved in the programme then rate the event and what they learnt. A printout compares what the event was trying to achieve with what it actually achieved. The printout also compares how much progress has been made towards the objectives with how much the event cost. The system is being rolled out during 2004. It is a good tool for evaluating impact systematically, although it only provides an immediate reaction, not longitudinal tracking of outcomes.

For more information call 01274 841 345 or look online (www.setpoint.org).

Case Study

I feel that it is more important to get feedback from the kids than it is from us. From the perspective of someone in industry, you have such limited time that the less forms there are to fill in the better.

Role model

☑ Evaluation checklist

- Are the objectives against which the scheme should be evaluated clear?
- Are you collecting feedback on the actual activities or events?
- Are you measuring how far the scheme is achieving its objectives?
- Have all the main stakeholder groups been included in the evaluation, i.e. teachers/community group leaders, young people and role models?
- Are evaluations carried out in previous years/for previous events being fed into the planning of future events?
Role model scheme operators and teachers are in agreement that getting the right role models for a particular scheme and providing them with ongoing support are critical to success. This chapter explores some things you should take into account when recruiting role models, the kind of assessment criteria that may be required, and the training and support they will need.

This includes:

- thinking about whether your role models need any particular experience or background;
- getting support from role models’ employers;
- being realistic about timing – and being flexible;
- providing any training required;
- ensuring you have ongoing support systems in place.

Recruitment

Role model schemes can vary greatly in shape or function, size and/or design. Think about what kinds of role models are appropriate to your specific scheme.

Your scheme might have a very selective recruitment process that aims to find only small numbers of highly motivated individuals who can make a significant commitment over time. The process might be similar to workplace recruitment, with applicants sending in written applications to scheme organisers, followed by a formal presentation and perhaps a panel interview. Another approach is to recruit hundreds of individuals who will take part in no more than a couple of events with young people in any one year. In this case, your recruitment process is likely to be less formal and more inclusive, to get the numbers of people you need. For example, it could operate on a self-selection basis, or through informal recommendations made by trusted peers.

For role models drawn from industry, partner companies may identify which of their staff are most suitable for a scheme.

Finding role models

There are over 1.3 million practising scientists, engineers and technologists in the UK, so the pool of potential role models is huge! Of these, 207,000 are female. While many ethnic groups are currently proportionally less well represented in the SET workforce than their White counterparts, there are still large numbers of practitioners from Black, Asian and other ethnic minority backgrounds who are potential role models, for example in 2002 there were 5,400 African-Caribbean people working in SET in the UK, 7,300 Black Africans, 30,000 Indians, 7,300 Pakistanis and 900 Bengalis.

Whatever recruitment process you are using, be clear at the outset about what will be expected from role models and the broad criteria that will be used to select them for the scheme. How much time will they be expected to commit and over what period? Will they need to have any training or undertake any other preparation? Help them present the most convincing and accurate case to their employers if their investment is going to occur during work hours.

It is difficult in terms of balancing my time, but I control my own diary so no one needs know that I am doing this, although I do need to be able to make up the time as I am charged out at an hourly fee to clients. Role model
To find the role models you need, think about the following possibilities:

**Tap into other role model schemes** – many national companies will already be part of the Science and Engineers Ambassadors scheme (SEAs). This allows you to get access to local role models through your local SETPOINT manager. They can provide an existing local pool of SET role model expertise, which will help you to avoid spending valuable resources on recruitment, and provide help with other practical issues (e.g. getting insurance for role models and CRB checks). In addition to specific schemes, it is also useful to invite people to participate who are already involved in SET in an ad hoc way, such as running a Young Engineers Club at their child’s school.

**Use existing social networks** – current and outgoing role models can help you to recruit new ones. You might find it useful to take an existing role model with you when you meet new companies or universities with the aim of recruiting new role models. Do not forget that your colleagues, friends and other acquaintances might make good role models or know other people that would: many people are only too happy to become a role model if asked.

**Make the business case to industry role models** – demonstrating the positive benefits of becoming a role model may help you to get support from businesses and individuals. Role models can gain good material for their CVs, which may be particularly relevant to those who are at an early stage in their careers. Many will also be able to act as a gateway into their company, potentially leading to involvement of managers, site visits, provision of equipment or sponsorship for schemes. See the chapter on working with business for more on making the business case.

**Approach individuals as well as companies** – it may be possible for people in senior roles to become involved on a personal basis without needing their company’s permission to do so.

**Recruit through a range of different places** – if you’re using the media, do not focus only on the major educational newspapers and science journals and publications. Target ethnic media (such as *The Voice* and *Eastern Eye*), relevant ethnic trade and/or professional groups and wider ethnic and equality organisations and community groups as well. On a broader and more local level, using the local *Primary Times* (a ‘what’s on’ guide for children, parents and teachers) and other local newspapers can help to recruit parents who have science degrees.

**Make sure your message is clear** – if your advertisements are accurate, everyone involved saves time and effort. You will not get applications from ineligible or inappropriate applicants and applicants will not waste time applying for inappropriate schemes. This does not mean that applicants need to have previous experience.

---

### Case Study

Let’s Twist uses a wide range of ways to locate and recruit female role models. Some of the role models that they work with regularly have recruited colleagues to help out at one-day events and have subsequently become involved in other role model activities. Everyone who works in the Let’s Twist office is on the lookout for potential role models and will ask women who approach them for other reasons if they would like to become involved. They also describe the importance of being alert to any opportunities and asking friends, family and those they meet at work and social events if they know any female scientists or engineers whom they might contact. Where possible they will proactively follow up these contacts by calling or visiting. For example on one occasion they went and visited a building site because they had heard that a woman was working there who might be a potential role model.
You should also consider the following when recruiting role models:

**Be prepared to invest time** – in larger businesses in particular, involving their staff in the scheme may mean getting the agreement of different people and layers of hierarchy. Although this can be time-consuming, securing co-operation from larger companies may bring rewards in terms of the number of role models recruited, which may be useful when existing role models move on to new employers. It can also be helpful with arranging site visits or getting support from business in meeting other needs, such as equipment.

**Is your scheme attractive to role models?** Consider the image that you are projecting of your own organisation. For example, are your staff from a range of different ethnic backgrounds? Do you have good employment and diversity policies?

**Pay and incentives** – many role models feel that they should not get paid for their role, although if resources allow, expenses should be offered. However, you may be able to provide them with an incentive, a small token of thanks for their contribution or a letter to their employer thanking them for allowing their staff to participate and recognising their contribution.

**Criminal Records Bureau checks** – make sure role models are aware that they will need to be cleared through the Bureau before working with children – and what documents they will need to provide for this.

**Have a strategy in place for handling the rejected role models** – you need to think about how you will turn role models away, should this be necessary. Think about referring them to other schemes where their talents may be used.

**Give feedback (where feasible)** – feedback is important, as unsuccessful applicants may be the successful role models of the future. Some form of response – even if standard – provides encouragement in this regard and might help a later application to succeed.

**Be flexible** – people are more likely to agree to become role models if their time commitment is flexible.

‘Role models need enthusiasm but they don’t necessarily have to be young – I have found that the grandparent-type figure can work very well with primary school children.’

Scheme organiser

---

**Good Practice Tip**

Develop a diversity plan for your own organisation. Inform yourself about your local community and its makeup. What is the national picture of diversity in science? If your confidence in diversity issues is evident, you are more likely to attract and retain a greater diversity of role models and also attract clients who want to work with you.

---

**Good Practice Tip**

It is important that young people see a diversity of faces whether they themselves are White or from an ethnic minority background. All the above methods may help you to recruit role models from ethnic minority backgrounds. However, you could also consider: approaching community groups that cater for particular ethnic minority groups to see if they can use their own networks to find suitable candidates (most local councils have a list of voluntary and community organisations in their area. You could also write to different places of worship); using media targeted particularly at ethnic minority groups; using messages in mainstream media that highlight your particular interest in attracting people from ethnic minority groups; and targeting parents from ethnic minority groups through local schools.
RECRUITING AND WORKING WITH ROLE MODELS

Scheme organisers agree that recruitment is a difficult and resource-intensive process. Be realistic about what you can achieve within any deadlines. Once you have recruited people, however, you will want to keep them. Spell out in detail the impact that withdrawing from a scheme mid-way will have in terms of young people feeling let down, and particularly young people who have already experienced repeated adult absence throughout their lives. It is better that people drop out in training, then you can be sure that those who remain involved understand clearly what they have agreed to do and are of the necessary quality. Developing regular communication with your role models and putting them in touch with other role models can help to retain them.

Desired qualities

Based on the comments, discussions and feedback received during the research for this study it has become clear that role models need a number of qualities to work closely and effectively with young people, hold their interest, earn respect and encourage them to think about SET careers.

Age

Role models of all ages have a valuable role to play. Younger role models (around 30 or under) can help to dispel the stereotypical image of scientists and engineers held by many young people. Young people of secondary school age will identify more readily with a role model relatively close to them in age – and the role model’s more recent experience of school will mean that he or she can identify with some of the concerns the pupils may raise. For children of primary school age, this may be less relevant, since even relatively young role models will appear old to this age group.

Further Information

All teachers and school support staff must apply for ‘disclosures’ from the CRB, and therefore the majority of schools will request that visiting volunteers (including SET practitioners or students visiting as role models) have also received a satisfactory CRB disclosure.

Although CRB disclosures for volunteers are free, in order to access the disclosure system, voluntary organisations have either to register with the CRB themselves (incurring a one-off cost of £300, plus £5 for each extra designated counter-signatory) in order to countersign disclosure applications, or access the system via an ‘umbrella body’. However, because of the extra work and responsibility involved in this role, there are not many umbrella bodies in the voluntary sector. SETNET is a registered umbrella body and SETPOINTS can process CRB checks for volunteers willing to become science and engineering ambassadors. Other scheme organisers are welcome to speak to their local SETPOINT or SETNET to see how they may take advantage of this facility.

Details are available online (www.setnet.org.uk) or 020 7636 7705. More information on CRB disclosure is available (www.disclosure.gov.uk/index.asp)

“We liked meeting the women – our teachers are men and they probably don’t mean to but they make engineering sound boring.” Year 9 female pupil
Gender and ethnicity

Meeting female role models is a positive experience for female students, challenging the stereotypes that they have of working in SET and opening their eyes to the possibilities available to them.

While this principle can also work for schemes directed at a specific ethnic group, ethnic matching of role models is difficult in diverse communities. Don’t assume, for example, that a scientist with an Asian background will be an appropriate model for young people from a wide variety of ethnic backgrounds. However, if you have a number of role models, make sure that they are of mixed gender and ethnicity.

Where good potential role models come to light who, for reasons of gender or ethnicity, are not appropriate for your particular scheme, ensure there is a way of redirecting them to other schemes where their skills can be used. However do not get too hung up on trying to match the gender and ethnicity of role models to particular groups of pupils unless it is particularly important to the purpose of the event such as encouraging girls to enter SET. The enthusiasm and communication skills of the role model are more important.

Outside social pursuits and interests

Research undertaken for the DTI *Go For IT!* poster campaign and published in the *Get With It* report showed that it was most important for girls that the role models were seen to be real people, just like the young people they are communicating with. If your scheme uses the media to raise the profile of SET (e.g. poster campaigns or TV adverts), think about including information on the social life of role models. This can include extra-curricular activities and interests such as sports and music that resonate with the interests of young people themselves. Ensure that role models from diverse backgrounds are included and that their social pursuits and interests appeal to young people of all backgrounds. These ‘cool’ pursuits help to act as a hook for young people and show that SET role models are ‘normal’ and that SET careers are open to everyone. Again, this can help to break down stereotypes.

Good Practice Tip

If you have a group of role models, whether in person at an event or in a photograph, make sure that they include both men and women and are of diverse ethnicity.

Case Study

Let’s Twist ran a one-day event involving female role models who were involved with a local new-school build. During the morning the role models worked with the girls on a number of exercises looking at plans of the site, discussing risk assessment issues and how you plan a construction project. One of the role models was a structural engineer who had drawn the plans for the new school and another worked for the building developers. In the afternoon the girls visited the actual construction site with the role models and saw how the plans were being used in the construction and the different skills involved in building a new school. As well as gaining an understanding of what the role models actually did, the fact that the building was a new school also helped the girls to relate to the project.

′If you have a group of people, that’s when it’s important to have a mix of sexes and races – it’s awful if you see a bunch of white men.′ Year 13 Asian female student

′Role models are not only great communicators and interesting SET people, but it’s important that they have interesting hobbies and outside lives – so some are windsurfers, rally drivers, are in a band.′ Main sponsor
RECRUITING AND WORKING WITH ROLE MODELS

Routes into SET
Show that there are various career pathways into SET by having role models who have not followed the conventional school/college/university route into SET sector employment. These might include mature students, people without a SET academic background, those who took Modern Apprenticeships and people taking foundation entry-level courses. As well as demonstrating that there is more than one way to get into SET, this approach might also mean you have a wider age spread of role models.

Communication and experience
Role models need to be able to communicate with young people from diverse backgrounds in a relaxed and informal manner, without using jargon or being patronising. Most important is a genuine enthusiasm for SET and SET-related careers. Training can help role models to ‘pitch’ to the right level for different age groups, but a degree of self-confidence and tenacity is required for what can sometimes be a demanding audience. Younger role models may be particularly nervous to start with. You need to think about the balance between the need for younger role models and the role model’s certainty and experience in his or her subject area and confidence in dealing with young people.

Previous experience of being a role model is not necessarily important. You will need to find out about the depth of the role models’ experience of SET and whether they have worked with young people in the past – for example running scouts or guides or volunteering for charity.

Positive communication and interpersonal skills are not only important when dealing with young people. Role models will be in contact with teachers and may need to raise awareness of SET in general and enthuse teachers about SET careers. Ensure that your role models have access to information and literature they can pass on to teachers.

Training
Training needs will vary from scheme to scheme. For example, role models supporting a scheme that extends over a term or more need to understand how to work closely with teachers and how their own work in a school relates to the National Curriculum. For one-day schemes, role models need tips on ways to gain pupils’ interest from

‘The women seemed friendly. They were like teenagers and they spoke to you on your level in a language you can understand. They made it interesting and explained it clearly.’ GCSE student

‘…the researcher was able to convey scientific concepts in everyday language, and make them seem relevant to the pupils.’ Teacher

Good Practice Tip
It is as important to present images of ethnic minority scientists to White students as it is to ethnic minority students. When you are developing materials always include images of people from a diverse range of backgrounds. Help your role models to engage an audience that includes young people from varying backgrounds by offering examples and materials that show ethnic minority scientists and engineers at work. Suggest they take along photos of their colleagues as well to show how they work in teams with lots of different people. Consider collecting a portfolio of examples or illustrations of science from around the world.
the start. However, there are common themes that you should consider when training role models for any kind of scheme.

**Expectations of role models**

An initial induction session should provide:

- some background to the scheme and how it fits with any other initiatives going on in the local area;
- what will be expected of the role model;
- what the role model can expect to get out of the scheme.

The induction should be conducted on a face-to-face basis. It is a time when the ‘ground rules’ can be set; for example, role models can be assured that it is OK to say ‘no’ to requests. Using existing role models to carry out part of the training is very effective, and allows new recruits to ask questions about what it is really like.

If possible, repeat this exercise after several months, so role models can update each other on their progress and build a consistent, collective understanding of their roles. Check periodically that role models are still happy to be involved.

**Understanding the settings in which they will be working**

When role models are going into schools, it may be necessary to provide them with a basic understanding of how schools work, the National Curriculum, and what can and cannot be done in schools. Discuss this issue with teachers at the planning stage, so that you can be sure you have covered everything. It is important that role models understand the level of support they are likely to get from teachers and schools – in many cases this will be limited.

Try to give your role models a working understanding of the wider context in which they will be operating. For example, for schemes using local and national media, role models may need some basic media training to help them to perform effectively when appearing on a local radio or TV station or being interviewed for a newspaper.

**Diversity awareness**

All role models need to be sensitive to working with young people from a range of ethnic minority backgrounds and not assume that everyone has the same experiences or values as themselves. Understanding the cultures of young people and the influences on them at home can help role models to communicate with young people. Insight into the specific barriers facing young people, for example from Pakistani backgrounds, is important. Looking for examples from overseas to illustrate points in talks and discussions can help bring cultural relevance to a talk.

Challenge role models’ own perceptions of the roles of men and women and the images they have in their mind’s eye. Incorporate case studies to stimulate discussion such as:

- Make sure that the role models understand how schools operate today and how science is taught. For example, they will quickly lose credibility with young people if they talk about choosing O-Level subjects or do not understand what the National Curriculum is. The role models may also not be aware that all students now study science to 16 and that there are many vocational qualifications being offered in schools, as well as the fact that much science education focuses on scientific literacy and debates about topical issues.

Good Practice Tip

If there are several role models, conduct initial training in a group so that role models can meet each other, share concerns and pool thinking. Role models value such team-building opportunities, particularly if they do not meet each other regularly during the life of a scheme.
as the example in the DTI booklet
Does Sex Make a Difference? Ref
URN 04/501, available from the DTI
orderline 0870 1502 500.

Presentation skills
Many role models will not have
worked with young people before
and may be nervous. Basic
presentation and communication
skills will help them build their
confidence. If possible, run brief
refresher courses during the scheme.

How role models come across to
young people is of vital importance.
A bad role model who puts young
people off SET is worse than no role
model at all. Think about whether
the pupils they are working with will
understand role models. How adept
are the role models at explaining
relevant concepts in a
straightforward way? When role
models have a strong regional or
national accent, young children in
particular may have difficulty in
understanding what they are saying.

Make sure your role models are
aware of how peer pressure can
work (e.g. SET is ‘uncool’). Knowing
where to go in case of discipline
issues is also important.

Challenge the beliefs and
perceptions of male and female role
models about the contribution of
women and ethnic minorities to SET.

SETNET’s checklist for induction
briefing of SEAs identifies key
points that role models should
understand before working with young people:
• the aims of the programme;
• how schools are structured and
  how they work today – role
models do not need to be
experts, but familiarity with terms
such as Key Stage, GCSEs and
National Curriculum will be
helpful;
• the constraints of the curriculum
  on schools’ activities and
  priorities;
• the pressures upon teachers and
  the importance of good
  communication with them;
• their role in supporting, not
  replacing, the teacher;
• how to behave with young
  people – in particular maintaining
  appropriate distance and basic
dos and don’ts;
• styles of learning, communicating
  and listening;
• knowing always to work in sight
  of a teacher or other adult.

Ongoing support
Immediate activity
Try to have an activity lined up for
role models to get involved in
immediately, so that you capture
their initial enthusiasm and retain
their interest. Some scheme
organisers wait until they have got

The training was more about the form than the content of
presentations, although the trainers did go through certain
activities the ambassadors could use to bring into presenta-
tions. Role model

Further Information
Existing organisations may be
able to help with training
role models for your scheme
and providing particular
expertise that you do not
have yourself. Try contacting
your local SETPOINT manager
(www.setnet.org) or
Education and Business
Partnership (www.nebnpn.org).

Further Information
Today it is more important
than ever for scientists to be
able to communicate their
work in a way that is both
effective and comprehensible
to fellow scientists, the media
and perhaps most importantly
the public. The Royal Society’s
one-day media and
communication training
courses, designed exclusively
for scientists and taught by
communication professionals,
aim to help maximise these
skills (www.royalsoc.ac.uk/
mediatraining).
an event coming up and then recruit role models specifically for it. It is also important that once role models are involved, they feel they are being used effectively and given the opportunity to get across vital messages to young people.

Small team support
Many scheme organisers find it simpler to work with a small group of active role models rather than a larger pool of people who get involved only occasionally. It is easier to keep track of a small team and build positive professional relationships than with a larger team, and role models may feel more supported, both from the scheme organiser and from other role models.

With a smaller team, it is also easier to check that role models are happy with their level of involvement and the number of requests they are receiving. However, by overusing role models you risk losing them altogether, so think carefully about the number in the team, balancing manageability and the amount of time you can reasonably expect role models to commit to the scheme.

New role models may need one-to-one support until they feel confident. You may also have to intervene if the school or community group reports difficulties.

Relationship with employers
If your role models are drawn from business, as well as supporting them as individuals you will need to think about how to maintain positive relations with their employers. This can be particularly important when role models move on. If you have a positive relationship with a company, you are more likely to be able to find a replacement volunteer.

 Feeling valued
Role models need to feel valued. There are many ways to achieve this but consider:

- written and verbal thanks after each event;
- social events bringing the role models together;
- sharing evaluation feedback from the events;
- recognising that it is OK to be involved for a while and then stop.

I really like the major support network, as role models in other schemes don’t have as much support and interaction.  

Role model

If you are keen you find the time, and that is true in any industry. My company does not check up on me in the morning etc and this allows me more flexibility than if I were on site – my company has been supportive of my role as it is related to the [engineering] industry.  

Role model
RECRUITING AND WORKING WITH ROLE MODELS

Incentives

If the time role models are spending on the scheme increases, think creatively about how you can accommodate this within the existing scheme structure. Will you need more role models or can you offer incentives to your existing pool to compensate them for their greater input? It is important to explain any change in expectations and negotiate any change in terms before introducing them.

“I received a bouquet of flowers after [the event] and get informal feedback from them which is always positive – the team are lovely.” Role model

“I have involvement in other schemes and don’t get extra time for my involvement – I just do it as part of my job. If RESPECT was three times a year then, with prep, you are looking at an extra week’s work per year. Beyond once or twice a year, you do need to start getting some kind of compensation for participation.” Teacher

☑ Role model checklist

- What sort of scheme are you planning and what expectations will it place on role models?
- What existing schemes/social networks can you look to, and draw role models from?
- What recruitment methods are you employing (do they attract diverse audiences)?
- What kinds of qualities are you looking for in role models? Consider:
  - enthusiasm for SET;
  - age;
  - gender;
  - ethnicity;
  - image;
  - routes into SET;
  - communication skills;
  - personality;
  - hobbies.
- Do all those involved share a common understanding of what the role models will be doing?
- Do role models understand the setting in which they are operating (school, media)?
- Have role models received adequate training in working with young people from diverse backgrounds?
- Can positive social relations be maintained with all role models across the team (too many, too little)?
- Are you giving positive feedback to role models after each event?
- Are you giving your role models ongoing support and the opportunity to feed back any problems, formally or informally?
ACTIVITIES

The above comment captures the most important thing to bear in mind when considering what kind of activities to include on a SET scheme. Interesting, challenging and enjoyable activities can bring the National Curriculum to life, open up new perspectives on the wider environment or raise new career options. The range of possible activities includes mentoring, e-mentoring, activity days out of school, activity days in school and ongoing clubs in and out of school.

In this chapter we look at the kinds of activities that capture interest and some practical issues to consider when planning activities. These include:

• making activities as hands-on as possible;
• linking activities to the real world;
• keeping the appeal broad – without forgetting who your audience is;
• arousing interest before visits and maintaining it afterwards;
• thinking about the practical issues involved.

What captures interest?

Hands-on activities bring things to life. They can introduce something new or offer a new way of looking at something familiar. Activities might take the form of investigations within the school or visits to local factories or businesses, construction sites, university science departments or museums.

Out-of-school activities

Young people find it exciting to take part in activities away from their school. Out-of-school activities have the advantage of introducing them to a workplace or college environment and emphasising the real-world relevance of problems they may have looked at in the classroom. It may also allow pupils from different schools to mix. For schemes involving businesses, outside visits make more efficient use of staff time than bringing the staff into the school.

It is important that the employees showing the young people around are not seen simply as tour guides but are recognised as being scientists or engineers themselves.

Older pupils may also be interested to learn about issues facing real scientists, such as the difficulties involved in securing funding and about how to communicate scientific arguments and data. Visits to universities and colleges also provide them with an opportunity to quiz students about life in general and to see young people from a range of ethnic backgrounds attending university or college.

Good Practice Tip

Activities that work well are hands-on, have some element of problem solving and a connection with the real world.

Case Study

The person organising a visit of primary school children to a SET company quickly found out that she had made a mistake in asking children to bring in a large man’s shirt to use as a mock lab-coat: the children wanted the real thing in order to pretend to be ‘real scientists’.

Further Information

The Royal Society’s Partnership Grants scheme offers funding for activities linking schools with scientists and engineers. Grants of up to £2,500 are available to schools needing to pay the costs of equipment, materials, travel and supply cover in order to take part in exciting projects. Find out more from (www.royalsoc.ac.uk/education/partnership.htm) or 020 7451 2561.

‘Think about how to incorporate science into fun, not how to incorporate fun into science.’ Year 13 female student

‘What works? Hands-on activities but not slapping a science label on it.’ Role model
**ACTIVITIES**

*The best thing for me was going round the college. You got to see what people were like and stuff and use their canteen.*  
Year 9 female pupil

**In-school activities**

Activities taking place in the school are enjoyed not only because of the activities themselves but also because the people presenting them are not teachers! If role models are coming to talk to students, they might bring with them something that captures the interests of students and helps them to explain their work. For example, one role model brought in what remains from sewage once it has been treated. For activity-based visits, role models may be able to bring with them the resources for hands-on experiments and demonstrations that are simply too expensive or exotic (or dangerous) for schools (especially primary schools) to get hold of. Finishing a visit ‘with a bang’ can help it to stick in young people’s minds – for example, a demonstration of the properties of liquid nitrogen and its effect on different materials.

On longer-running schemes, where activities need to tie in with the National Curriculum, new ways of looking at topics already covered can awaken interest.

**Key points to remember**

Wherever the scheme is offered, there are some important things to keep in mind.

**Keep the appeal broad**

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 explicitly about SET. Placing activities within the context of problem solving and discovery – effectively turning the young people into detectives – can help.

Not all careers in SET require high academic achievement and there is a wide range of opportunities available. For example, many young people will not have thought about opportunities such as marketing or being a manager for an engineering or technology company, or of how art and design might relate to SET. **By providing a real context for SET, role models can help to open eyes to new potential futures for the young people they meet.**

*They showed some things that were dangerous and not [for] our age group.*  
Primary pupil

*They bring a new perspective to the syllabus because they don’t know it, so they show you a wider relevance.*  
Year 12 student

**Good Practice Tip**

Visits to colleges and universities provide young people with an opportunity to experience environments that they feel might be intimidating. Visiting labs with role models – and just seeing the inside of a university – may help to dispel this and encourage them to pursue further study.

**Good Practice Tip**

Interactive approaches work extremely well. Video, however, is seen as out-dated by many young people, and should be used sparingly in conjunction with more interactive approaches.

**Case Study**

The Young Engineers Club at Middleton Primary School in Leeds has used some real projects such as a competition sponsored by MFI to design the furniture of the future to capture the enthusiasm of the young people. The role model working with the club has been able to challenge the young people to think about how their designs, such as a wardrobe that will automatically dress you, could actually work and helps them to discover how this might be possible.
Know your audience
While keeping the appeal broad, bear your audience in mind: a ‘one-model-fits-all’ approach is less likely to work than one that focuses on the interests of your audience. For example, if you are working in an all-girls school, you may more easily arouse interest with activities that connect with their everyday lives and are carried out in a way that suits their learning styles. Women engineers taking students round a construction site may help to break down stereotypes. Similarly, if you are working with Black African or Black Caribbean boys from an inner-city secondary school, think about the kinds of activities that might awaken their enthusiasm, such as the role of engineering in the music industry.

Different audiences might require different approaches. Young Black Caribbean students may feel that teachers do not expect them to succeed and are not interested in their progress. A firmer approach can demonstrate that you are committed to their success. Think they can achieve and expect them to do so.

School building work might provide an onsite opportunity to bring construction and engineering to life. For example, a viewing panel could be constructed, so pupils can follow progress; in-class work could be linked to specific activities, such as linking work on pneumatics to drilling.

If possible — and where appropriate — link activities to the day-to-day work of role models. This can be harder where role models are, for example, post-doctoral research students working in highly specialised areas. However, if young people can see that the type of activity in which they are involved is not just a ‘school task’ and has wider application for the role model, this can help them to understand its relevance.

Ensure that activities are inclusive
Consider how role models can be used in different parts of the curriculum, such as: industrial heritage links to history; debates on GM foods and embryo testing to citizenship; sustainable development to personal, social and health education and so on. Think about what will appeal to the range of young people and ensure that activities take account of the diverse ethnic backgrounds and cultural influences of your audience. Broaden post-event discussions to further consider gender segregation in jobs.

Case Study

A one-day scheme to increase girls’ interest in science involved them carrying out an investigation into shampoo, following which they knew all the different pH values of the products involved. They related this to advertising claims and clearly enjoyed being able to bring a more informed perspective to what they were being sold. This provides a good example of how activities can relate to the existing interests of specific groups of young people – in this case, teenage girls.

Good Practice Tip

Try to build feedback from children and young people into the process as a whole. This will help you to refine your activities and approach as the scheme progresses and can help with evaluation. The feedback process can be a fun activity in itself: using coloured cards or objects to vote with; or interacting with a web-based survey.

Further Information

The DfES publishes advice on health and safety during educational visits (www.teachernet.gov.uk/wholeschool/healthandsafety).
Organising your activities
Giving all those involved an opportunity to ‘have a go’ is important. This means splitting classes or larger groups into smaller units. Each group will need support from an adult, so make sure there are enough role models.

Develop pre- and post-visit activities. Teachers will welcome ideas or lesson plans that support activities and help them to build on the benefits of your scheme.

For ongoing activities such as after-school clubs, develop ongoing projects to retain interest over time. There may be competitions running which people taking part in your scheme can enter. Provide teachers with information on these, where possible.

Practical considerations
As well as the actual activities, think about:
- what materials are allowed in schools;
- health and safety and insurance – ensure that young people and others will be covered when onsite and that they are briefed about safety;
- let teachers know if the pupils are likely to require special clothing or shoes when they go on site visits.

Supporting media
Some schemes make considerable use of supporting media such as the internet, posters or videos. Key points to bear in mind here include:
- use ‘real’ people in posters or other written material – for example, use direct speech, provide names and occupations and make sure they are engaged in an activity;
- ensure that the images used include men and women from a range of ethnic backgrounds;
- scheme websites can be a focal point for sharing good practice and a useful gateway for teachers. They can be particularly important for schools in rural areas. The internet can provide a useful and familiar tool for young people to undertake their own investigations in connection with a particular scheme or role model visit. However, be mindful of internet safety and parental permissions when putting photos of young people on websites;
- current debates in the media can be used to help young people develop a more critical approach to press coverage of scientific issues.

‘Think about what the kids watch on TV – look at the whole thing from their perspective.’
Year 13 Black Caribbean Secondary student

Good Practice Tip
Connect activities 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 activities to TV programmes, 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. Visit the Royal Society’s website for background on topical issues for discussion (www.royalsoc.ac.uk).

Good Practice Tip
Try to develop activities that produce something pupils can take home with them. This can help to get parents involved and supporting their child’s enthusiasm. If this is not possible, can you help schools cover the cost of taking photographs of pupils involved in activities and displaying these at parents’ evenings?

Good Practice Tip
For cross-curricular activities make sure all relevant staff within any school-based schemes are informed and involved where possible.
Think about how you can introduce a diversity dimension into your activities. For example, you could devise an activity that looks at the sources of food and their country of origin or one that compares the nutritional value of a sweet potato to an ordinary potato.

Good Practice Tip
Role models can provide additional capacity for in-school or community events, allowing you to reach larger numbers or run more complex or interesting activities. Role models will often be happy to visit schools and run events without the direct involvement of the scheme organisers – most schemes work on this premise. These events are most effective if activities are designed in advance and role models are briefed and given any materials needed.

Further Information
The Qualifications and Curriculum Authority website has some resources produced by the Association of Science Education that give some examples of ethically relevant activities and topics for discussion in science lessons (www.qca.org.uk/ages3-14/inclusion/1594.html).
Different schools have different needs; think about the benefit any particular school might derive from being involved in a role model programme. Be realistic about what schools are capable of; many, if not most, will have limited funds and time to dedicate to schemes. Your approach to schools will also vary depending on the type of scheme you are planning – e.g. is it ongoing or based around single visits?

In this chapter we look at some of the factors you will need to consider when working with schools and teachers. This includes:

- planning a school-friendly scheme;
- how to promote your scheme to schools;
- planning for different types of scheme;
- things to think about while the scheme is running.

Planning a school-friendly scheme

Your scheme needs to fit in with the realities of everyday school life and be sufficiently flexible to allow role models to promote SET in an interesting and engaging manner. How you do this will depend to some extent on the type of scheme and the particular school. Where possible, involve teachers from the earliest stages of planning a scheme, so they can flag up at an early stage things that might lead to difficulties in running the programme in the classroom.

You also need to consider administrative issues, in particular health and safety and child protection. There are restrictions on the materials that can be taken into schools, so you will need to be aware of these. You will also need to make sure that role models have been checked by the CRB.

The most crucial element to bear in mind when working with teachers is the balance between the requirements of the scheme and teachers’ other responsibilities. Teachers need to feel that the benefits of the scheme outweigh the time and effort involved in taking part. You will need to think about:

- whether teachers will require any training to deliver the scheme – and how much time this is likely to take;
- if teachers are to deliver the scheme, those with a non-science background need to have confidence in their ability to do so;
- the costs to the school of involvement in the scheme;
- whether you can offer the school any additional support – for example, sessions on INSET days;
- how your role models will work with the school and individual teachers;
- whether and how your scheme fits with the National Curriculum – this might include subjects other than science;
- whether you can provide lesson ideas or lesson plans to support the scheme or help teachers continue work after it has finished;
- how to follow through on the work of role models once they have left the school.

If your scheme is going to be working with Muslim girls, be sensitive to parents’ concerns. Reassure the school and parents that the girls will only work directly with female role models. Be similarly sensitive where boys are concerned.

**Further Information**

The School Science Service (CLEAPSS) provides advice to subscribers on health and safety, including: risk assessment; sources and use of chemicals, living organisms and equipment; advice on technicians and their jobs; and lab design and fittings (www.cleapss.org.uk).

**Case Study**

The Birmingham Ishango Science Club (www.ishangohouse.com/IshangoScienceClubs.html) works with African-Caribbean young people and prides itself on placing parental involvement at the heart of the scheme to ensure that the positive messages with regard to SET are not negated at home. As part of this involvement some parents were recruited to conduct lessons during Black History Month.

**Good Practice Tip**

The Birmingham Ishango Science Club (www.ishangohouse.com/IshangoScienceClubs.html) works with African-Caribbean young people and prides itself on placing parental involvement at the heart of the scheme to ensure that the positive messages with regard to SET are not negated at home. As part of this involvement some parents were recruited to conduct lessons during Black History Month.
Promoting your scheme to schools

Your initial approach to a school should take into account its specific situation: for example, did it get a poor OFSTED report for its science teaching, or does it have specialist science status? What are the school's development priorities? What is the profile of its pupils? Understanding a school can help you to ‘sell’ your scheme and may also save time that would otherwise be spent approaching schools for which your scheme is not suited. You may of course wish to design a scheme around the needs of a particular school.

Understanding the benefits to schools and individual teachers of being involved in a SET scheme can also help you to promote it. These benefits might include:

- Continuing professional development (CPD) – for example, teachers may work with different year groups while delivering a scheme, or widen their knowledge of SET and SET-related careers. You should consider CPD in relation to the whole school and not just the teachers who are directly involved. This will help the scheme to continue if a particular teacher leaves the school, and widen its impact.

- Challenging stereotypes – involving teachers with SET schemes may help to challenge some of their own assumptions about scientists and engineers and raise their awareness of SET career options. This is important, since teachers can have a considerable influence on pupils’ enthusiasm for SET and their ultimate career choice.

- Enhancing materials – role models can provide input into lesson plans and other materials, perhaps updating them or providing real-life examples to bring them to life. In particular those from ethnic minority backgrounds can help teachers with ideas for ensuring that lesson activities appeal to pupils from a diverse range of backgrounds.

Promoting your scheme to parents

You should also consider whether it is possible to include parents in the scheme. This can be a useful way of bringing parents up to date with SET and helping to ensure that their views do not undermine the work your scheme is doing. Involving parents could be done very simply, by writing them a letter to explain what you are doing and why. Other suggestions are more time-consuming (for you and for teachers), such as holding a session for parents while the scheme is running to talk about the activities their child is involved in – and perhaps getting them to do some of the activities themselves! In some cases it may be possible to involve parents in the scheme itself as role models or additional helpers.

Planning for different schemes

Ongoing schemes

Schemes in which a role model visits a school on a regular basis will...
require more forward planning and organisation than those involving one-off visits. You will need to ensure that teachers and role models share an understanding of each other’s roles. For example, is the volunteer simply an additional teaching resource, helping to deliver the curriculum, or is he or she there to widen pupils’ understanding of SET and talk about the practicalities of a career in SET?

Role models may be nervous initially and know very little about how schools work, so it may take them a few visits to settle in. Teachers and schools should be aware of this, as they may need to provide them with additional support in the early stages.

Where equipment and materials are required, be clear about who is responsible for providing these. If it is the responsibility of the school, you might try to find out if there are local sources of support on which a school can call. For example, where a scheme is running in a primary school, a neighbouring secondary school may be able to provide laboratory space on the odd occasion. The more organising you can do on behalf of a school and the more you can reduce their costs, the better.

Day visit schemes
Where role models are in a school for a whole or part of a day only, there are fewer things to consider.

However, in some ways, responsibility for gaining the maximum benefit for pupils may fall more on the teacher than it does for longer-term schemes. For example, teachers will need to keep the activities carried out with role models fresh in pupils’ minds and emphasise the relationship between their day-to-day classroom work and any investigations they carried out with role models. Consider what support you can provide to help teachers. For example, can you provide lesson plans or ideas that place activities and investigations done on the visit within the context of the National Curriculum?

Out-of-school trips
If your scheme involves school trips to local sites or businesses, consider the impact of this on the school. This includes thinking about transport, supply teacher cover, risk assessments, insurance cover and health and safety. Will you expect the school to cover the costs of these or can you or the company you are visiting help?

Working with community groups
Develop strong relationships with any local community groups that you wish to target, such as those from ethnic minority communities. Avoid only brief contact with them. Find out who they are and what programmes and activities they run. You can then work towards building SET-related activities into their programmes.

Case Study

The African-Caribbean Network for Science and Technology in running role model programmes for Muslim young people always consults with the parents, particularly if activities are taking place outside school. They find that the support of parents in this regard is really crucial, and that it is important to take into account the sensitivities of some parents, with particular regard to girls. In some cases, where they have had girls and boys together, in response to the feedback from parents, they have had the girls interacting with female role models only, and the boys with male role models only. In some cases they have also run girls-only or boys-only programmes with same-gender role models. In their experience, as long as you are prepared to be flexible, responsive and sensitive to the concerns of parents, there should be no difficulties in successfully supporting Muslim young people in SET-related role model activities.

Case Study

Let’s Twist has found that encouraging teachers to hold a debrief discussion with or without the role model after a site visit can reinforce positive points and also help to highlight and address any negative experiences.

‘At first, we felt as though we were doing the role models a favour.’ Teacher, primary school
Things to consider while the scheme is running

Where schemes involve a role model visiting a school for a longer period, think about how you support the school and deal with any problems that might arise. You might plan formal feedback sessions at regular intervals or call the relevant teacher to have informal chats. Discuss the feedback process at the planning stage, including whether the role model will be involved in these sessions or not and what processes are in place for the teachers and role models to feed back to each other.

It is also a good idea to have a process in place for resolving any problems that arise while the scheme is running; again, it is best to discuss this with teachers at the planning stage.

Good Practice Tip

Provide teachers with some background information on the role model. This might include details of any previous experience of schools or working with children and young people, as well as something about the job that the role model does. Submitting a simple CV and job description could be part of the recruitment process, giving you readily available information for this purpose.

Scheme organisers’ checklist

- Are schools, teachers and role models in agreement about the objectives of the scheme and how it will operate?
- Are teachers and role models clear about their respective responsibilities to the scheme?
- Can you provide support to teachers from a non-science background?
- Can you offer continuing professional development to the school, including its governors?
- Can you provide lesson plans or ideas to help teachers continue the scheme?
- Have you checked the administrative details – health and safety, child protection?
- Do teachers have an opportunity to feed back to you on how they feel the scheme is running?
The chapter on communication mentions the importance of everyone involved being clear about the objectives of the scheme and what is expected of them. This includes any business partners who might be involved in the scheme through providing role models, funding or onsite visits. This chapter looks at some of the benefits to businesses of supporting SET role model schemes, the issues you will need to consider and what information businesses might need.

**Good practice**

**Explaining the scheme**

In initial discussions with businesses, make sure that there is mutual understanding and agreement on the following issues:

- the objectives of the scheme;
- the age group(s) the scheme is aimed at;
- the way the scheme works in schools;
- the purpose of involving business;
- the timing of the visit or other activities;
- any materials required during the visit to a business or site and who is to supply them;
- the role of the business representative (e.g. Do they see themselves as role models? What do they understand by that?);
- health and safety, insurance and risk assessment issues.

**Making the business case**

Getting involved in SET role model programmes can bring a range of benefits to businesses. Understanding these and being able to explain how they relate to a particular business may make the difference between gaining and losing support for your scheme.

There are three strands to the business case. Being involved in a SET role model scheme can help to build a company's reputation – something to which companies are paying greater and greater attention. It can also play a role in staff training and development. Finally, it may have long-term benefits in recruitment and staff retention.

**Reputation**

Corporate social responsibility and community involvement play an increasingly important role in helping companies to build and maintain a good reputation. Supporting the local community may also be a condition under which planning applications for new developments are granted. Participating in a SET scheme can enhance a company's reputation in a range of ways. Within the company, employees (who may well be the parents of local children) are likely to take a positive view of its involvement in a scheme. The attitudes of the community towards a business may be improved: people ‘The children get a better impression of industry… they get a modern view. These schemes can improve relations with the local community and give a business a better reputation.’ Scheme organiser
may have an out-dated view of factories, for example, or not understand the skills required by its workforce. One company involved in a scheme in the north of the country won an award recognising its contribution to the local community.

Staff training and development
Staff within a company taking part in a SET scheme may need to have some training as part of their involvement. Typically, this will be in communication and presentation skills. They may need to be able to explain complex processes to primary school children, for example, and to relate their work within the company to work done on a smaller scale within the classroom.

Long-term benefits in recruitment and retention
It is difficult to measure the precise impact of a scheme on recruitment and retention, but anecdotal evidence suggests three possible ways in which involvement in a SET scheme might benefit a company.

- Pupils who gain a positive view of SET, and a greater understanding of its role in different industries and of the variety of SET careers, may be more likely to pursue science to a higher level in school and on to university. Pupils who have had a visit from a role model working for a particular company may well remember that company in later years, when looking for a job themselves.
- Getting involved with the local community can make people within the area look more favourably on a company and be more likely to consider it as a possible employer.
- Involvement in a SET scheme can increase employees’ morale, which may have a positive effect on staff retention.

Useful information for business partners
The businesses you are working with may have little knowledge of how schools work, and it will help them if you can provide them with some details. These could include such things as:

- how they can find out the term dates of schools in their local area;
- key aspects of the National Curriculum that the target age group is following, including the concepts the pupils are likely to be familiar with;
- school jargon – e.g. Key Stages, SATS etc.

‘The children did pre- and post-visit drawings of a scientist and a factory. You could see from these that their views had changed. In the pre-visit drawings the factories were dirty, with lots of smoke and pollution. But after they were clean and modern-looking.’ Teacher
Does the business involved understand the objectives of the scheme?
Are your business contacts clear about their own responsibilities as partners in the scheme?
Are your business contacts acting as role models or as guides on a site tour?
Have you briefed those involved with site visits on the concepts and language familiar to the pupils?
Do those running the site visits have the appropriate communication skills for the age range of pupils?
Have you considered health and safety, insurance cover and risk assessment?
FOR ROLE MODELS
BECOMING A ROLE MODEL

Being a role model is extremely rewarding. You can make a genuine difference to the way young people think about science, engineering and technology. You can help to change the ‘wild hair, white coats and glasses’ image of scientists that young people often have, and make science seem relevant to them. This is particularly important in increasing the number of women and people from ethnic minority backgrounds who go into science and engineering.

You can also gain valuable skills – for example, in communication and presentation. In this chapter we look at some of the things you will need to think about before becoming a role model and during the time you support a scheme.

These include:

- the reasons you want to get involved in a scheme and your expectations of the experience;
- your experience of working with children and young people;
- the amount of time you have to give to a scheme;
- the level and nature of support the scheme will provide;
- your expectations of the scheme (e.g. payment, other incentives);
- whether you will need permission from your employer to take part.

Being clear about the objectives of the scheme

Make sure you are clear about the objectives of the scheme that you are getting involved with and that it matches any particular interests that you have. Some possible scheme objectives are to:

- interest young people from ethnic minority backgrounds in SET and encourage them to pursue a career in this field;
- show girls that traditionally male sectors such as engineering and construction actively welcome women as well;
- attract more able young people into SET degrees or other SET courses;
- capture the interest of young children in science and engineering so that they may consider it in a positive light.

Why are you getting involved?

Think carefully about why you’re getting involved before you sign up to a scheme. Young people say they value role models who have a passion for their subject and bring their experience of the real world to life. Being a role model can be good for your CV, but it should not be the only reason to get involved. You will need genuine enthusiasm for working with children and young people and for introducing them to SET.

‘He made science seem real, it wasn’t just stuff written on the board that you didn’t quite understand, but he did the experiments with you, and used lots of similes to make it fun and compare it to everyday situations.’

Year 6 Primary pupil

Further Information

If you are particularly interested in working with young Black people to encourage them into SET then you could contact the African-Caribbean Network for Science and Technology (www.ishangohouse.com) to see how you might get involved.

Further Information

If you are particularly interested in working with girls to help get more women into SET then you could contact the UK Resource Centre for Women in Science, Engineering and Technology, helpline: 01274 436 485 (www.setwomenresource.org.uk) or the WISE campaign (www.wisecampaign.org.uk).

Good Practice Tip

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 a 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?’
What are your expectations?

Making sure that your expectations match what the scheme will require of you will help to make things run more smoothly. For example, are you expecting training? How much ongoing support will you need? How much time will you have to dedicate to the scheme? If you think you need two weeks of training and weekly feedback meetings but are planning to get involved with a small local scheme, it might be wise to review these expectations—or perhaps look for a different scheme.

Also think about the young people you will work with and what expectations you have of those from different age groups, and of different gender and ethnicity. Do you know what their level of knowledge will be? How are you expecting 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, your hobbies, your relationships, social activities, work environment, the car you drive, etc. How comfortable will you be responding to these more personal questions?

Thinking about time is particularly important: if the scheme is ongoing and you are expected to go into a school once a week for a whole term, not showing up will disappoint your audience and create difficulties for teachers.

What can you bring to the scheme?

Think of all the things that you can bring to the scheme—these are why role models are such an asset! For example:

- previous experience—tell people what it was like being at college or university as well as about what you do now;
- your own personal qualities—enthusiasm for what you do is vital;
- resources—maybe your company could provide some resources for activities or prizes for competitions;
- additional recruits—see if other people you work or study with would be interested in getting involved.

These factors can be important in helping scheme organisers make the most appropriate use of your skills and interests.

If you’re in business, think about what your company can offer to the scheme. This might simply be time—e.g. time off for training for the scheme or for going into schools.

We’ve had some people who were stern—you need to be able to crack a joke. A-Level student

Good Practice Tip

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 a part of any talk you give.

Good Practice Tip

Show you work with different people. It’s teamwork. Take along pictures of colleagues of different ethnic backgrounds (even if they are from different departments). Ask your scheme organiser if there are images that you can use, if you don’t have them.

Good Practice Tip

Be realistic about the time you have available, and do not over-promise: it is better to do a little well than raise the expectations of the young people and then fail to deliver. If you are going to be unavailable for chunks of the year—on field trips for example—warn the scheme organiser at an early stage.

“You need to juggle your own time—I don’t usually work Fridays but I did last week so it enabled me to take the morning off work and come here.” Role model
BECOMING A ROLE MODEL

It could also be access to materials or an opportunity to take young people on a tour of your business site. If you’re at university or college, can you take them into the labs? The scheme organiser, who will also be responsible for health and safety, insurance cover and risk assessments, will probably have considered these things, but do think about whether you can offer anything extra.

What will you need to ask the scheme organiser?

Before your first meeting with a scheme organiser, jot down a list of questions. This will help to make sure that your own expectations are in line with what the scheme is asking of you. We have provided a sample list in resource 3.

If you’re joining an established scheme, find out if there are any role models you can talk to before you start, so you can get some hints and tips from them. Ask them, and the scheme organiser, how successful the scheme is. They might have some evaluation information you can look at. On some schemes you might be involved in different activities with different groups of young people. Make sure you’re clear about:

- what activities you are expected to undertake with the young people (sometimes scheme organisers or the school will have a clear idea about this but sometimes they will be expecting you to come up with the ideas!);
- who is responsible for supplying and transporting any equipment needed;
- when and where you need to be, and if there is any set-up time needed;
- whether you need to talk directly to anybody in advance of the event;
- who you should contact on the day if you are unable to attend or are running late, and how you should contact them;
- whether you’re working alone or with other role models or people involved with the scheme.

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’re ‘putting on an act’.

If you’re running activities on your own, ask the scheme organiser to put you in touch with other role models involved in the scheme – you can share ideas and help each other solve problems.

‘The women seemed friendly. They were like teenagers and they spoke to you on your level in a language you can understand. They made it interesting and explained it clearly.’ GCSE student

‘I would have liked them to have come for the whole week and not just three days.’ Primary school pupil

SETNET has a newsletter called SETPIECE, produced three times a year. It contains: write-ups of the activities that its science and engineering ambassadors have been undertaking, with photos of young people and role models in action; invitations for others to get involved in specific events; and reports from partner organisations. Some of the regional SETPOINTs also produce their own newsletters. You can view previous newsletters (www.setnet.org.uk).
ONGOING COMMUNICATION

When you are involved in an ongoing scheme you will probably get some form of regular contact from the scheme organiser. This could be a newsletter, email or telephone call. Make sure you know who to contact to give your feedback or to ask for advice.

It’s important to recognise when you have had enough: this can happen if you are repeating the same activities in different schools over a long period. If you find you’re getting bored, talk to the scheme organiser. There might be other ways you can support the scheme.

Preparing for your visit

If you are part of a wider scheme, your scheme organiser will be able to help you prepare. You might be preparing for a visit to a school in an independent capacity and not as part of a formal scheme, in which case some of the earlier sections might be useful to you. Visit some of the websites listed at the back of this guide in the resource section, or go on-line and think about you, your job and your life, the school and the people you will be meeting and speaking with and consider what messages you want to get over. Do ensure you are up to date with things like GCSEs and terms like the National Curriculum.

Read the sections about defining a role model scheme and ensure that you and the contact person at the school have agreed the objectives of the visit and who the main audience will be.

Visit the websites of the learned societies and gather some careers materials together to give to the teacher, if not enough for each pupil.

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 a typical day like?
- What do you look like and what impression do you want to convey?
- What level do you need to talk to – infant, primary or secondary? Consider the interests of this group and avoid stereotypes.
- Think of examples that will be meaningful to your audience. Can you relate your example to a film targeted at this age group, for example Brother Bear or Finding Nemo?
- 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!

Be careful about stereotyping jobs and roles through what you say and how you respond to questions.
Evaluation

Most schemes will want to carry out some kind of evaluation to see whether the scheme is meeting its objectives. This might involve asking you to give feedback about the reaction of the young people to you and the activities you are doing. Be as open and honest as you can.

Some schemes organise get-togethers for the role models so that you can discuss your experiences with each other and with organisers.

Good Practice Tip

Ask the scheme organiser if you can see feedback from other role models to compare to your experience. You may well find that something you have been worrying about is very common. The scheme organiser can also put you in touch with other role models so that you can discuss your experiences.

Case Study

Around six months after joining the NOISE scheme (www.noisenet.ws) the role models spend a day with the scheme organisers giving feedback on what has worked and what has not worked so well. As the role models are spread throughout the UK, this also gives them the chance to swap experiences and share good practice with one another.

Further Information

The Royal Society’s Partnership Grants scheme offers funding for activities linking schools with scientists and engineers. Grants of up to £2,500 are available to schools needing to pay the costs of equipment, materials, travel and supply cover in order to take part in exciting projects. Find out more online (www.roylsoc.ac.uk/education/partnership.htm) or call 020 7451 2561.
FOR SCHOOLS AND TEACHERS
INvolving role models Effectively

This section may also be useful for community groups wishing to get involved in SET role model schemes.

Schools that get involved with SET schemes see a range of benefits. A new face in the classroom awakens pupils' interest. Teachers can develop their skills and keep up to date with the latest research or SET business applications. Primary schools can get access to resources that wouldn’t otherwise be available, including support from neighbouring secondary schools. Many teachers say that behavioural difficulties are reduced when role models are in the school.

Scheme organisers will probably have worked with teachers at the planning stage and understand the importance of hands-on, fun activities – especially for schemes aimed at younger children. However well planned a scheme is, you will be integral to its success in your school. In this chapter we look at some of the ways in which you can support a scheme taking place in your school. This includes:

- clarifying expectations;
- supporting activities;
- letting role models know key facts about your school;
- engaging in ongoing communication.

Getting involved

Good communication with the scheme organiser and the role models will help enormously in ensuring that the scheme works well and that unexpected surprises are kept to a minimum. You need to be clear about what is expected of you and your school and what support the scheme will offer to you.

Make sure scheme organisers have a broad profile of your school intake, including its ethnic mix, and that role models are aware of the ages and abilities of the children they will be working with. If several role models are coming into your school, check with the scheme organiser that they will not all be White men but will include women and those from different ethnic backgrounds. Scheme organisers will also need to know how many children will be present, so that they can be sure of having enough role models for small-group work.

Do make sure that you are in agreement with the scheme organiser on key issues. We have provided a checklist in resource 4 at the back of this guide.

Case Study

‘Our teachers get a lot out of it – for example, it gives the class teacher an opportunity to get out of her reception class to teach other groups, so that helps her professional development. The pupils get an opportunity to do things they would not otherwise do. Our local secondary school sent in technical laboratory equipment and some teachers too. The pupils liked meeting the new people. Generally, it gives science a higher profile within the school and a lot of it is relevant to the whole curriculum, not just science. The children can transfer their knowledge into other areas.’

(Primary school teacher)

Good Practice Tip

It is important to be clear about what your school or community group is able to provide and what you need the scheme or role model to provide.

‘He [role model] made it real – before it was just writing stuff.’ Year 6 female pupil

‘It’s much easier to promote a subject when you’ve seen people enjoying it.’ Teacher
Supporting activities

The activities that work best involve an element of problem solving and look at topics in a way that shows them in a new light. Most of all, however, they need to be fun.

Wherever the scheme is offered, there are some key things to keep in mind:

Think about pre- and post-visit activities. Depending on the scheme, you may be able to access supporting resources that will help you to continue looking at some of the themes covered in activities. These resources might include:

- ideas for lessons, or lesson plans to use either before or after specific activities;
- help from role models in ensuring that follow-on lessons reflect diversity issues;
- access to role models outside the specific scheme activities;
- supporting notes or other material.

Posters or other information about real scientists can be used as supporting materials for schemes. Make sure you think about the gender and ethnicity of the people in any images you are using; not all scientists are White men!

If you’re in a primary school, are there neighbouring secondary schools with science resources you can access?

Are there any competitions running that your school can enter, using the skills developed by students through a role model scheme? Could the pupils start up a mini-business? Look at national activities and events too. Can you link in the scheme with Black History Month, National Science Week or the Royal Society Summer Science Exhibition?

Are there any websites relating to the scheme that pupils can use? These might provide games, ideas for how to develop activities or additional resources for teachers.

Good Practice Tip

Think about how you can introduce a diversity dimension into your activities. For example you could devise an activity that looks at the sources of food and their country of origin or one that compares the nutritional value of a sweet potato to an ordinary potato.

Good Practice Tip

Think about how the role model scheme relates to other areas of the curriculum. Many of the activities offered by SET role model schemes can be presented in other contexts: for example, you could look at sound engineering in a music lesson or the chemistry of food in food technology.

The teachers’ notes are excellent. They list all the activities and give background scientific information, which is very useful because primary teachers often don’t have this kind of knowledge. They make it much easier to do follow-up teaching. Teacher

The volunteers bring in excellent resources that the school wouldn’t be able to get hold of normally. Also, the expertise of the volunteers is important, combined with the fact that they talk in a language the children can understand – it’s scientific but accessible. They’re always committed and enthusiastic too and the children are always very focused. There are no behavioural problems – they come out buzzing. Teacher
Consider how role models and SET can be used in different parts of the curriculum, e.g. industrial heritage links to history; debates on GM foods, embryo testing etc to citizenship; sustainable development to personal, social and health education and so on. Current debates in the media can also be used to help young people develop a more critical approach to press coverage of scientific issues. Think about how the activities can reflect the interests of all your pupils. Be aware of the interests of different ethnic groups.

Is there a building project on your school site or nearby that could be used as an ongoing, real-life case study for a variety of SET skills and potential careers (e.g. designing the building; using CAD technology; site management; construction and engineering skills; health and safety issues)?

Schemes that include outside visits can introduce children and young people to workplaces or college environments. This can help pupils to understand the relevance in the real world of problems they may be looking at in the classroom. On some schemes, there may also be an opportunity for pupils to meet their peers in different schools. Visits to universities or colleges may help to dispel pupils’ worries and make them seem less intimidating. They can also give pupils an opportunity to quiz students about university or college life in general.

Being involved in a role model scheme may also mean you can introduce your students to investigations or experiments that are simply too expensive or exotic (or dangerous) for schools (especially primary schools) to run on their own.

Practical considerations
In addition to the actual activities, you will need to think about:

- health and safety and insurance – check with the scheme organiser that young people and others will be covered when onsite and that they will be briefed about safety by those taking them round a site or business;
- make sure your pupils dress appropriately for site visits.

Supporting activities checklist

- Is the main focus on activities that will engage your pupils and keep their interest?
- Do the activities specifically relate to diverse cultures?
- Who is supplying any materials needed?
- Are you sufficiently familiar with the concepts used?
- How does the scheme relate to other subjects being taught – can you link it to other parts of the curriculum?
- Can you get support from, or work in partnership with, local organisations (e.g. businesses, schools, colleges, universities)?
- Are there any pre- and post-visit activities available from the scheme?
- Does the scheme have a website or can its organiser suggest sites to visit?
- Are there any competitions relating to the scheme that your school can enter, or national events that you can tie it in with?

Further Information

The School Science Service (CLEA PSS) provides advice to subscribers on health and safety, including: risk assessment; sources and use of chemicals, living organisms and equipment; advice on technicians and their jobs; and lab design and fittings (www.cleapss.org.uk).
Ongoing communication

You should be clear about how to contact the scheme organiser and agree what level of feedback and type of ongoing communication there will be. For longer-running schemes, you will need to have the contact details of role models in case of any last-minute changes that will affect them.

Many schools and community groups participating in role model schemes appreciate the opportunity to share experiences with others who are similarly involved. See if the scheme offers this opportunity or, if not, how it could be created.

It is important to ensure that others who have a strong influence on the young people do not undermine the values and objectives of the scheme. You might be able to help with this by involving parents in communication about the scheme and its objectives. Similarly, you may be able to involve careers advisers. Ask the scheme’s organiser if they have thought of this and if there are any you could use.

‘Everyone wanted to know what university was like, half wanted to know about PhDs, half about science issues.’

Role model

Communication checklist

- Are you clear about the objectives of the scheme and how it will operate?
- Is it clear who is responsible for what? For example:
  - briefing role models about the activities;
  - organising any transport for the young people;
  - recruiting young people for the scheme;
  - providing any equipment needed.
- Have you thought about how you can involve parents in the scheme?
- Are you clear who to contact in case of difficulties?
- Have you thought about how you can involve those giving careers advice?
- Are you in contact with other schools or community groups involved with the scheme?

Involving parents in the scheme can help to strengthen messages about the attractiveness of careers in SET. This might mean inviting parents along to an introduction or end-of-programme event, sending material home with young people or inviting parents to take part in activities alongside the role models. Some parents will have a SET background themselves and could be invited in as role models in their own right.

Further Information

(www.mentorplace.org/Activities.htm) – this is an IBM site that gives lots of practical activities for young people based around science and technology.
A survey of over 1,000 scientists carried out in 2004 to inform this guide 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. In assembling this good practice guide we also questioned many young people who had just taken part in some kind of activity with SET role models about its effect: 41% said that they weren’t planning to study science or engineering before their involvement but that now they might (with 28% saying they were going to study science or engineering anyway).

However, the direct effects of role model schemes on the final career choice of young people are extremely difficult to measure, given the whole range of other factors that also affect career choices.

Despite the difficulties and resource implications of demonstrating the long-term effects of role model schemes, much can be gained by carrying out small-scale evaluation of the immediate reaction to the scheme from the young people involved. Most scheme organisers will incorporate this into their scheme and will also ask you to give feedback. Your school can also benefit by improving the events and activities on the basis of feedback from the young people involved.

Event feedback

Use a simple questionnaire to collect feedback at the end of a specific event, to see what worked particularly well and what participants would like to be different.

It can be fun for your pupils to give feedback and it is a useful assessment tool for you. Oral presentations, posters and PowerPoint displays, newsletter articles, peer-led surveys etc. are other creative ways to elicit feedback from your pupils. Most scheme organisers will welcome feedback in any form you can provide it, but check if they are going to ask you to complete something in addition.

If the scheme organiser is collating the feedback ask to see the results from your own pupils so that you can make improvements next time. Schemes collect this information so they can meet your needs better.

Achievement of objectives

While it is not possible to measure the ultimate impact of role model programmes on final career choice, you can measure whether the programme or activity has taken steps towards meeting its intended objectives (for example, if the objective was to get more girls into SET careers, are they more interested in this as a result of the scheme?).

If you are involved in a regular session, such as an after-school computer club for girls or a Young Engineers Club, you could carry out tests at the start and end of each term to see whether participants’ knowledge about SET, their confidence and their attitudes to it have changed.

Questionnaires sent out to pupils and teachers following the RESPECT annual science festival event showed that people felt that the pace of the event was too rushed. This resulted in the festival the following year being changed from a half-day event to a full day.

The Construction Industry Training Board, which runs the Construction Ambassadors scheme (www.citb.org.uk/support), collects evaluation forms from both teachers and pupils. The information is collated centrally so that patterns for certain activities can be built up and issues for improvement highlighted. As a result of the systematic analysis of evaluation data, changes have been made to the structure of a number of events.
Giving feedback
Most scheme organisers will ask you to give some form of feedback to them. It is important that you tell them what you feel is not working very well in addition to what is working well. You may also want to think about what you or your school or community group more generally could do to improve the way the scheme works.

If you have any particular difficulties with individual role models, and have been unable to resolve these directly with them, discuss this with the scheme organiser right away, rather than waiting until you are asked to give feedback.

Could you also get feedback from parents about their views of the scheme? This might be done informally, at a parents’ evening for example.

If there are careers advisers working at your school, have they noticed any changes in pupils’ interest in SET careers?

Follow-up activities
To capitalise on the interest stimulated as a result of their involvement in the role model scheme, young people should be asked whether they are interested in pursuing any further activities. These might be provided by the original scheme, or may be something that you will need to arrange separately. For example, those who are particularly interested may want to set up an after-school club. Others may wish to explore the opportunities for work experience at a SET company.

SETPOINT West Yorkshire has devised an on-line evaluation tool to help evaluate events and specific Science and Engineering Ambassador programmes. The organiser (e.g. teacher) ranks a list of objectives provided by SETNET and adds any others. A cross-section of those involved in the programme then rates the event and what they learnt. A printout compares what the event was trying to achieve with what it actually achieved. The printout also compares how much progress has been made towards the objectives with how much the event cost. The system is being rolled out during 2004. It is a good tool for evaluating impact systematically, although it only provides an immediate reaction, not longitudinal tracking of outcomes.

Further Information
The Royal Society’s Partnership Grants scheme offers funding for activities linking schools with scientists and engineers. Grants of up to £2,500 are available to schools needing to pay the costs of equipment, materials, travel and supply cover in order to take part in exciting projects. Find out more online (www.royalsoc.ac.uk/education/partnership.htm) or call 020 7451 2561.
Let’s Twist (http://letstwist.bradfordcollege.ac.uk) organised a ‘Get Girls into Construction’ day for a group of fifteen year 9 girls from three different schools. This involved activities with three female role models who worked in construction and a visit to a construction site in Bradford where a new school was being built. At the end of the day, two girls wondered if it might be possible to arrange some work experience for them in the construction field. One of their teachers who had been observing the day undertook to approach two major construction projects in their area to see whether this would be possible.


**Evaluation checklist**

- Have you asked the scheme organiser for the results of any feedback received from your young people?
- Have you followed up the interest generated as a result of the scheme?
- Have you used previous feedback to inform future activity?
## RESOURCE 1

Checklist of issues for scheme organisers to discuss with teachers

<table>
<thead>
<tr>
<th>Issue</th>
<th>Your Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>The objectives of the scheme</td>
<td></td>
</tr>
<tr>
<td>The type of young people (What age? Any particular requirements of the scheme such as an interest in science or likelihood of gaining a certain level of attainment?)</td>
<td></td>
</tr>
<tr>
<td>The number of young people that will be involved</td>
<td></td>
</tr>
<tr>
<td>The size of the total group, where more than one school is involved</td>
<td></td>
</tr>
<tr>
<td>The activities that role models will undertake</td>
<td></td>
</tr>
<tr>
<td>Timetabling of events, visits or other activities</td>
<td></td>
</tr>
<tr>
<td>The support that will be offered by the scheme (e.g. If a role model is visiting the school, what should the school do if it is having any sort of difficulty with the role model? If pupils are being invited to an event away from the school, who is responsible for the transport and supervision?)</td>
<td></td>
</tr>
<tr>
<td>The support that the school is able to offer (e.g. availability of equipment)</td>
<td></td>
</tr>
<tr>
<td>The role required of the teacher (e.g. teachers must understand that role models must not be left alone with pupils)</td>
<td></td>
</tr>
<tr>
<td>What follow up will be available (e.g. mentoring for young people who are particularly interested)?</td>
<td></td>
</tr>
<tr>
<td>How can parents be involved?</td>
<td></td>
</tr>
<tr>
<td>How can careers advisers be involved?</td>
<td></td>
</tr>
</tbody>
</table>
**RESOURCE 2**

Checklist of issues for scheme organisers to discuss with potential role models

<table>
<thead>
<tr>
<th>Issue</th>
<th>Your Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>What the role model wants to get out of their involvement</td>
<td></td>
</tr>
<tr>
<td>What training and support they need</td>
<td></td>
</tr>
<tr>
<td>What the main messages are that they should try to get across</td>
<td></td>
</tr>
<tr>
<td>The age and general level of ability of the young people involved</td>
<td></td>
</tr>
<tr>
<td>How you are going to keep in contact</td>
<td></td>
</tr>
<tr>
<td>What they should do if they encounter any difficulties</td>
<td></td>
</tr>
<tr>
<td>What equipment they might be able to provide for activities</td>
<td></td>
</tr>
<tr>
<td>What activities they are going to be involved in</td>
<td></td>
</tr>
<tr>
<td>The length of their commitment</td>
<td></td>
</tr>
<tr>
<td>Discuss issues relating to gender and ethnicity and their belief about the role of women in SET</td>
<td></td>
</tr>
</tbody>
</table>
## Checklist of issues for potential role models to discuss with scheme organisers

<table>
<thead>
<tr>
<th>Issue</th>
<th>Your Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are the objectives of the scheme as a whole?</td>
<td></td>
</tr>
<tr>
<td>What will the role models be expected to do?</td>
<td></td>
</tr>
<tr>
<td>How are role models selected?</td>
<td></td>
</tr>
<tr>
<td>What training will you get and will there be further personal development opportunities offered as the scheme continues?</td>
<td></td>
</tr>
<tr>
<td>What time commitment is required from role models?</td>
<td></td>
</tr>
<tr>
<td>For business people – will the scheme organiser approach your company to explain the scheme and ask for its support or will this be your responsibility?</td>
<td></td>
</tr>
<tr>
<td>How will you feed back your experience or any problems? E.g. are there regular formal meetings or is feedback informal and <em>ad hoc</em>?</td>
<td></td>
</tr>
<tr>
<td>How much input can you have into the scheme itself? Who makes the decisions and are they open to your suggestions?</td>
<td></td>
</tr>
<tr>
<td>What is the age and what are the general abilities of the young people involved? Are you comfortable with this?</td>
<td></td>
</tr>
<tr>
<td>Where will you be working (e.g. school, workplace, community venue, somewhere else)?</td>
<td></td>
</tr>
<tr>
<td>Who is the scheme aimed at (e.g. girls, at young people from ethnic minority backgrounds, all young people)?</td>
<td></td>
</tr>
<tr>
<td>What background information will you be given? E.g. will you get details on how schools work and what the school will expect of you?</td>
<td></td>
</tr>
<tr>
<td>Can you meet the people you’re working with before you get started on the scheme itself?</td>
<td></td>
</tr>
<tr>
<td>Will you get any payment or incentives? How do you reclaim expenses (e.g. travel, materials)?</td>
<td></td>
</tr>
</tbody>
</table>
# RESOURCE 4

Checklist of issues for teachers to discuss with organisers of schemes they are interested in

<table>
<thead>
<tr>
<th>Issue</th>
<th>Your Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>The objectives of the scheme</td>
<td></td>
</tr>
<tr>
<td>The type of young people to be involved (What age? Any particular requirements of the scheme such as an interest in science or likelihood of gaining a certain level of attainment?)</td>
<td></td>
</tr>
<tr>
<td>The number of young people that will be involved, and the size of the total group where more than one school or group is involved</td>
<td></td>
</tr>
<tr>
<td>The background of the role model and training they have had – for example, what experience they have had of working with children and young people</td>
<td></td>
</tr>
<tr>
<td>Any support that the role model is likely to require</td>
<td></td>
</tr>
<tr>
<td>Expectations regarding direct contact with the role model in advance</td>
<td></td>
</tr>
<tr>
<td>The activities that role models will undertake</td>
<td></td>
</tr>
<tr>
<td>What materials (if any) you are expected to provide for the activities</td>
<td></td>
</tr>
<tr>
<td>Timetabling of events, visits or other activities</td>
<td></td>
</tr>
<tr>
<td>Transport and supervision arrangements if the young people are going off site</td>
<td></td>
</tr>
<tr>
<td>The support that will be offered by the scheme (e.g. If a role model is visiting the school, what should you do if you are having any sort of difficulty with the role model?)</td>
<td></td>
</tr>
<tr>
<td>What follow-up will be available (e.g. mentoring for young people who are particularly interested)</td>
<td></td>
</tr>
</tbody>
</table>
1) Overall, how would you rate the event?
- Excellent
- Very good
- OK
- Not very good
- Terrible

2) What did you particularly like about the event?

3) What was the most interesting thing you learnt?

4) What didn’t you like?

5) If the event was being run again, what do you think should be done differently?

6) Which of these best describes you?
- I wasn’t going to study science or engineering before and I still will not
- I wasn’t going to study/work in science or engineering but now I might
- I was already going to study/work in science or engineering

7) Are you?  - Male  - Female

8) If you would be interested in other events or information about science or engineering please write your contact details below:

   Name:............................................................................. Telephone (optional) ...................................................
   Address:.......................................................................... Email (optional) .........................................................

Many thanks for taking the time to complete this questionnaire
Estimated numbers employed in SET by ethnic group and gender

Role models: Estimated numbers employed in SET by ethnic group and gender

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>1,059,900</td>
<td>189,000</td>
<td>1,248,900</td>
</tr>
<tr>
<td>Black – Caribbean</td>
<td>4,700</td>
<td>700</td>
<td>5,400</td>
</tr>
<tr>
<td>Black – African</td>
<td>5,400</td>
<td>1,900</td>
<td>7,300</td>
</tr>
<tr>
<td>Indian</td>
<td>22,400</td>
<td>7,700</td>
<td>30,100</td>
</tr>
<tr>
<td>Pakistani</td>
<td>5,700</td>
<td>1,600</td>
<td>7,300</td>
</tr>
<tr>
<td>Bangladeshi</td>
<td>700</td>
<td>200</td>
<td>900</td>
</tr>
<tr>
<td>Chinese</td>
<td>5,200</td>
<td>1,600</td>
<td>6,800</td>
</tr>
<tr>
<td>Other</td>
<td>18,800</td>
<td>4,400</td>
<td>23,200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,122,800</td>
<td>207,100</td>
<td>1,329,900</td>
</tr>
</tbody>
</table>

RESOURCE 7: USEFUL WEBSITES

Existing Role Model Schemes – Universal

BA CREST (run by the British Association) – www.the-ba.net/the-ba/ResourcesforLearning/BACRESTAwards
Construction Ambassadors – www.citb.co.uk/support/teach_support/default.htm
Engineering Education Scheme – www.engineering-education.org.uk
Headstart (run by the Royal Academy of Engineering) – www.hdstart.org.uk
INSPIRE (run by Imperial College) – www.imperial.ac.uk/inspire
NOISE – www.noisenet.ws
Pimlico Connection (run by Imperial College) – www.imperial.ac.uk/pimlico
Planet Jemma – www.planetjemma.com
Primary Science Enhancement Programme (PSEP) – www.gravityisahat.com/product_psep
Regent College, Leicester - http://www.regent-college.ac.uk
Researchers in Residence (RinR) – http://extra.shu.ac.uk/rinr/site
RESPECT – http://www.ishangohouse.com/RESPECT.html
Science and Engineering Ambassadors (SEAs) – www.setnet.org.uk/cgi-bin/wms.pl/29
Science and Engineering Experiments for Kids (SeeK) – www.seekscience.org
Science through Schools and the Community, Biotechnology and Biological Sciences Research Council – www.bbsrc.ac.uk/society/schools/Welcome.html
STIMULUS – www.stimulus.maths.org
Undergraduate Ambassadors Scheme (UAS) – www.uas.ac.uk
Why Not Chem Eng? (Institute of Chemical Engineers scheme) – www.whynotchemeng.com
Wolverhampton RESPECT Festival - http://www.ishangohouse.com/RESPECT.html
Young Engineers – www.youngeng.org

Existing Role Model Schemes – for girls

CWEST (Cornwall Women in Engineering, Science and Technology) - http://www.portia.ic.ac.uk/partners/database/cwest.html
Let's TWIST – http://letstwist.bradfordcollege.ac.uk
Verena Holmes Lectures (run by the Women's Engineering Society) – www.wes.org.uk/verenaholmeslecture.shtml
WISE (Women Into Science and Engineering) – www.wisecampaign.org.uk/wise.nsf/?Open

Existing Role Model Schemes – for Black and other minority ethnic young people

ETHNIC – www.bit.ac.at/Ethnic
Ishango Science Clubs – www.ishangohouse.com/IshangoScienceClubs.html

Other useful ethnic minority related web resources

The DFES’s ethnic minority achievement website has reports of good practice in school in raising the achievement of ethnic minority pupils – www.standards.dfes.gov.uk/ethnicminorities/good_practice
The Qualifications and Curriculum Authority has guidance on providing learning opportunities in science that help pupils to value diversity and challenge racism – www.qca.org.uk/ages3-14/inclusion/1594.html
The Muslim Council of Britain has guidance on issues such as dress for Muslim pupils – www.mcb.org.uk
The African-Carribbean Network for Science and Technology – www.ishangohouse.com
The American Association for the Advancement of Science Minority Scientists Network has lots of advice on issues such as mentoring, workforce diversity and supporting ethnic minority scientists – http://nextwave.sciencemag.org/miscinet
Teacherworld addresses the need for including diversity and inclusion issues throughout the school curriculum – www.teacherworld.org.uk
SET education, promotion and support organisations

African-Caribbean Network for Science and Technology – www.ishangohouse.com
Association for Science Education – www.ase.org.uk
British Association for the Advancement of Science – www.the-ba.net/the-ba
Clifton Scientific Trust – www.clifton-scientific.org
Engineering and Technology Board – www.etechb.co.uk
Geological Society – www.geolsoc.org.uk/template.cfm?name=geohome
National Education Business Partnership Network – www.nebpn.org
Physics at Work – http://education.iop.org/Schools/supteach/secondary.html
Royal Institution of Great Britain – www.ri.ac.uk
The Royal Society – www.royalsoc.ac.uk
The Salters’ Institute (chemistry teaching and education support charity) – www.salters.co.uk/institute
Schools Science Service – www.cleapss.org.uk
SETNET – www.setnet.org.uk
The Smallpeice Trust – www.smallpeicetrust.org.uk
The Wellcome Trust – www.wellcome.ac.uk

Professional bodies

Institute of Biology – www.iob.org
Institute of Marine Engineering, Science and Technology – www.imarest.org
The Institute of Physics – www.iop.org
Institution of Chemical Engineers – www.icheme.org
Institution of Electrical Engineers – www.iee.org
Royal Academy of Engineering – www.raeng.org.uk
Royal Society of Chemistry – www.rsc.org

Government bodies and funding bodies

Biotechnology and Biological Sciences Research Council – www.bbsrc.ac.uk
British Academy – www.britac.ac.uk
British Council – http://www.britcoun.org
Construction Industry Training Board – www.citb.org.uk
DTI set4women – www.set4women.gov.uk
Engineering and Physical Sciences Research Council (EPSRC) – www.epsrc.ac.uk/website/index.aspx
Natural Environment Research Council (NERC) – www.nerc.ac.uk
Office of Science and Technology – www.ost.gov.uk/index_v4.htm
Particle Physics and Astronomy Research Council (PPARC) – www.pparc.ac.uk/
Royal Society Partnership Grants – www.royalsoc.ac.uk/education/partnership.htm
Science Engineering and Manufacturing Technologies Alliance (SEMTA) – www.semta.org.uk/semta.nsf/?Open

Other useful websites

Criminal Records Checks – www.disclosure.gov.uk/index.asp
Health and safety – www.teachernet.gov.uk/wholeschool/healthandsafety
Mentoring – www.mentorplace.org
Royal Society Media training – www.royalsoc.ac.uk/mediatraining