



Welcome

Welcome to the first edition of our newsletter for teachers in the Schools Affiliate Scheme. The Schools Affiliate Scheme has been launched by The Institute of Materials to act as a bridge between Schools and Colleges, Industry and Universities. Our aim is to help you, as teachers of materials related topics, in a number of practical ways.

Firstly, there is this newsletter which will be issued every term and is designed to make you aware of some of the many resources available from companies, (much of it free), from government departments or sponsored bodies, and from ourselves, here at the Institute of Materials. On page 2 there is an in depth outline of what you will be able to find in future issues of this newsletter, along with

details of the special features to be included on an annual basis.

However the newsletter is only part of our ongoing commitment to you. We will also be co-ordinating links between individual schools and local companies and universities, (see page 3). This will give you, and your pupils, a chance to see what really goes on and experience at first hand the scale of some of the topics that are covered at school.

Like any scheme however, the Schools Affiliate Scheme cannot all be one sided. You need to tell us what you want, how we can best help you and why you may be having difficulties teaching materials related topics. In the margins throughout the newsletter you will find contact points in order to get further information and please use them to let us have your views, questions and comments.

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Co-ordinators Column

Hello, my name is Ruth Withey and I'm the co-ordinator for the Schools Affiliate Scheme. As a graduate of the University of Birmingham (Chemistry and Materials Research), I am particularly interested in ensuring that materials teaching is given every possible assistance. Materials science is a diverse and developing area. There are many rewarding and challenging careers available to young people that want to enter manufacturing, engineering and production companies. I hope that through the Schools Affiliate Scheme you will find materials science easier to teach. I'm here to help you and I really would appreciate all the feedback I can get to make this scheme worth being part of.

What's inside

<i>In the pipeline</i>	<i>page 2</i>
<i>Making the connection</i>	<i>page 3</i>
<i>CD - ROM Review</i>	<i>page 4</i>
<i>Year 12 Courses</i>	<i>page 5</i>
<i>Chocolate Challenge</i>	<i>page 6</i>
<i>UCAS Conventions</i>	<i>page 7</i>
<i>The Institute of Materials</i>	<i>page 8</i>
<i>Materials World</i>	<i>page 8</i>

In the Pipeline

Each term there will be a number of regular features, together with a special focus on a subject, such as university courses, or textbooks, which are especially topical at those times of the year. Listed below are details about those articles that you can expect. We hope they will prove valuable to you and if there is anything else that you would like to hear about then just drop us a line.

SPECIAL FEATURES

Autumn term.	Spring term.	Summer term.
<ul style="list-style-type: none">Textbooks and study texts.Want to know about the new books that have just been published? We can help with an objective review, together with an at-a-glance summary of the strengths and weaknesses of each text.	<ul style="list-style-type: none">Courses and open days at Universities.Many Organisations run activities directly aimed at teachers and pupils, and we will be giving the dates in advance so you can make plans to attend.	<ul style="list-style-type: none">Materials at University.Additional guidance to find the right courses for your pupils that want to study materials further.Details on the courses available, what the courses involve and the type of careers that this could lead to.

REGULAR FEATURES

Experiments. Examples of fun experiments and everyday observations that can safely help explain materials to your students. We will also help you get hold of any special materials that you may need to teach materials effectively.

Letters. Whilst we will reply to all letters, there will be some correspondence that raise important points or provide help and advice to other teachers. These will be published in the letters section with a copy of the resource material reviewed in that term's issue going to the person who sent in the main letter.

Career profiles. We want students to study materials in order to enter jobs in engineering, production or manufacturing. To this end we will be identifying careers that use a strong materials grounding and showing you how the careers of other people have progressed. Some have taken unusual paths before reaching their current position, and can help others when making these important decisions.

Reviews. Page 4 has a review of the CD-ROM produced by the Science Museum. In addition to the special feature in the autumn term, each term we will be reviewing an aid to teaching, be it book, CD, video or information pack produced by industry. We will be letting you know when it may be useful, how to get it and practical considerations such as how much it costs.

Spotlight. The back page of each newsletter will turn the spotlight on the organisations that seek to promote materials by providing help to schools, students and industry.

Materials World. With our quick reminders you should get the most from our members journal.

In view of the delays in getting this first issue of the Schools Affiliate Scheme newsletter to you, there will be **two editions this term**. The second edition will be sent out towards the end of June.

Coming up next time

- Profiles of the **careers** of some of the younger members of The Institute of Materials.
- The back page spotlight will look at **The Chemical Industry Education Centre**, at York.
- Finally, do not forget that there will be our first **letters page** giving you the chance to state your views, request help from your colleagues and share your best practices.

Making the connection

Did you know?

- ❖ The government body that funds postgraduate research encourages PhD students to go into schools under the Pupil Researcher Initiative scheme. See below.
- ❖ Universities run various open days and courses for teachers and Year 12 students to help them understand more about materials science and how it relates to the world around us.
- ❖ Engineering and Manufacturing companies are actively looking at ways to help schools. Several companies and professional organisations produce information packs aimed at the various key stage levels.



So how do you get hold of all the help that is available to you? That is where the Institute of Materials wants to help. In addition to all the information in our newsletter, we are seeking to put you in touch with University and Industrial contacts. Interested people, willing to visit your school, bring in and demonstrate new resources and tell you what is available locally to make materials relevant and stimulating. It is expected that you, either individually or with your pupils, will be invited to return these visits. At the universities you will get hands on experience of what the degree courses offered involve and how different areas of the National Curriculum can be explained. As an industry we want you and your pupils to develop a keen interest in the materials that

we all use every day. Universities want pupils to make informed choices about what they want to do. It benefits everyone if there is less doubt when applying, less changes when starting a course and greater confidence when making long term plans.

Likewise trips to industry help everyone to see in practice what is actually involved in a specific process and how everything, both people and machinery, fits together. Teachers as well as pupils should find course work more attractive when it comes to life on an industrial scale.

So what do you have to do? Get in touch and let us know if you already have any links with industry so that we do not duplicate these. Otherwise sit back and let us do the rest. We will shortly be putting you in contact with your local Institute of Materials representative, and we will also arrange for the industrial and academic links to contact you direct to organise the first visit.

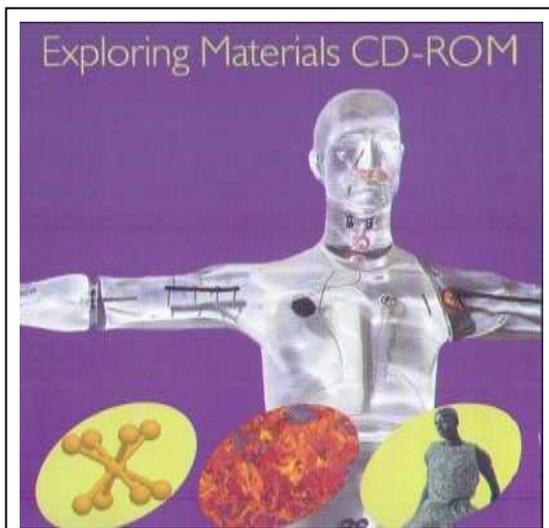
PRI - The Pupil Researcher Initiative

The PRI was started a few years ago and was highlighted in the March issue of *Materials World*, - *Back to School* p169. It is organised by Nicky Fuller at the Centre for Science Education (Sheffield Hallam University)

Every school should have received details of the scheme when it was launched. The scheme arranges for a research student from your local university to come into school on a regular basis, say for an engineering or science club.

For further information contact Nicky Fuller on 0114 225 4880 (Fax 0114 225 4881) or have a look at the website at www.shu.ac.uk/schools/sci/pri



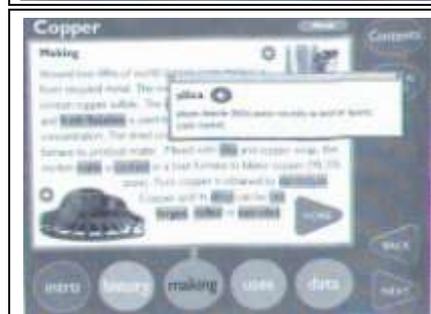
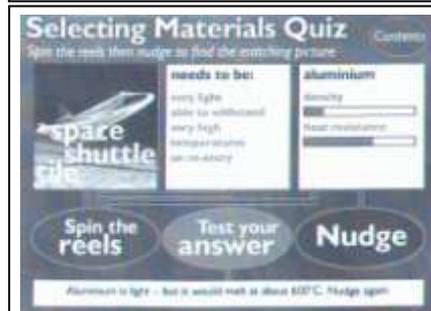


Exploring Materials CD

Our opinion.

Overall, straightforward to install, easy to use and fun to investigate. This is the sort of presentation that pupils will enjoy browsing through. It illustrates well that different materials suit different applications. Even wrong answers to questions lead to interesting information about how historically materials have been used, sometimes with amusing results. Fun for younger pupils and with sufficient depth for older ones.

The user has the option of either looking at materials under specific topics or just perusing the databases.



Each section is well presented and it is easy to move forward, using the short cut buttons, in order to get specific information. The use of short video clips and questions also adds interest. The accompanying "Teachers notes" provide ideas of assignments for students, (linked into specific areas of the CD). There is additional guidance for teachers as to the ability stage at which the assignments are aimed; detailed work for A level / GNVQ and short quizzes for younger pupils. Guidance is also given in the form of the underlying aim of the task, background help and time required for completion.

Good Points

- Visually very appealing.
- Easy to use and the interactive areas are fun.
- Plenty of information and detail if students require.

Bad points

- Most suited to individual working rather than groups or whole classes.
- Video clips lack fine definition

The Science Museum is open seven days a week, (except at Christmas) from **10.00** to **18.00**.

Admission is Adults £6.50
Concessions £3.50 with teachers free when with a group

The National Museum of Science & Industry (NMSI) comprises the Science Museum, London, the National Museum of Photography, Film & Television, Bradford, and the National Railway Museum, York.

The Science Museum also has a series of interactive exhibitions on contemporary science, medicine and technology around the UK. They are designed to appeal to the whole family and can be seen at a wide variety of venues, from museums to shopping centres and hospitals.

More information about the Science Museum available on their website www.nmsi.ac.uk

Cost: £40

Ability range: KS2/3/4, GNVQ and A level

Contact: The Exploring Materials CD-ROM: Education Pack ISBN 1 900747 103 is available on approval from:

REM Ltd, Great Western House
Langport, Somerset
TA10 9YU

Tel. 01458-253636

Fax 01458-253646

e-mail sales@r-e-m.co.uk

AVP, School Hill Centre
Chepstow, Monmouthshire
NP6 5PH

Tel. 01291-625439

Fax 01291-629671

e-mail avp@compuserve.com

Computer requirements: Windows 3.1, Windows 95, Windows 98 or Macintosh System 7

Colour Monitor (640 x 480 pixels/256 colours), & CD-ROM drive

Year 12 Courses

What are they there for?

These courses are run by universities as **an introduction to both university life** and a course in a material science related subject. Certain universities offer several degree courses, some of which are run jointly with other departments such as Biomaterials, (medicine and dentistry) or Sports Science, but the Year 12 courses are suitable for pupils interested in any of these subjects. They offer the opportunity to find out about all courses run by that university and how they differ from each other.

What is involved?

The year 12 course gives an indication of what it is like to go to university to study on one of these courses. The courses vary, with some just for one or two days whilst others involve several days **living like a student** in a hall of residence, attending lectures, undertaking laboratory exercises on various materials subjects, as well as taking part in an active social program.

Are they worthwhile?

According to previous course members they are very worthwhile. These courses have been running of several years and **feedback is generally full of praise**. We want to show that materials science and engineering is both relevant to the world around us, and a good career choice. Above all however, these courses are fun, because that is how a prospective student's interest is raised.

For example, at Birmingham, students get a chance to build crash helmets, (and test them!), construct a loud speaker, use the university's microscopes and testing equipment, (very destructive), and generally get involved in those activities that previous students have found enjoyable. Even the lectures are geared at keeping students interested in real materials issues, whilst still being light-hearted.

Who is running them?

The University of Birmingham 4th –7th July 1999

Queen Mary and Westfield College 15th June 1999
Biomaterials 26th April, 7th June, 20 August 1999

University of Wales at Swansea 5/6 & 8/9 July 1999

How to get on board.

Contact each University directly;

Birmingham: Dr Alison Davenport. 0121 414 5191 a.davenport@bham.ac.uk
The University of Birmingham, School of Metallurgy and Materials, Edgbaston, Birmingham B15 2TT

QMW: Dr Cath Pedley. 0171 975 5159 c.h.pedley@qmw.ac.uk
Queen Mary and Westfield College, Mile End Road, London E1 4NS

Swansea: Dr Chris Arnold 01792 295749 j.c.arnold@swansea.ac.uk
Department of Materials Engineering, University of Wales Swansea, Singleton Park, Swansea SA2 8PP

To find out about other courses and open days at different Universities contact them direct. There is a list of names and phone numbers in the back of your teacher's booklet of experiments.

Manchester Materials Science centre is staging **Materials '99** on **23rd June**. This is a free annual one-day program of lectures and demonstrations. The lectures are given by researchers and include:

Electrifying Ceramics

Racing cars and Spider Threads

Bio-Materials

World of Polymers

There will be no talks on Careers and University Courses, although they will be pleased to answer any questions.

The day is aimed at pre-university students aged 14 - 18 years. The day begins at 09.30 and will finish by 15.30. Lunch, tea and coffee are provided. Accompanying staff are very welcome.

Places are limited to a total of 40 students so hurry if you are interested.

Please contact Dr James Marrow on 0161 200 3611 or james.marrow@umist.ac.uk

The University of Manchester & UMIST, Grosvenor Street, Manchester, M1 7HS,

Experiments

As part of your membership pack you should have all received the IoM “Teachers’ Pack on experiments in Materials Science”. The experiments in this booklet are all designed to be easy, safe and fun, yet still get across the basic facts about Materials science. However as the syllabuses of the different examining boards change, and to allow us to have fun dreaming up new and wacky ways to convey the materials message, we shall be bringing you new ideas and experiments to try out. Feedback on how these ideas have been received will be most welcome.

If the Science Museum is not feasible for a visit why not try some of the other “hands on” exhibitions around the country. Here are a few of the bigger ones.

The **Bristol Exploratory**,
Tel 0117 907 9000

Website:

www.exploratory.org.uk

(hurry - it closes at the end of August!)

Eureka! in Halifax

Tel: 019467 27027.

email: 100306,2220@compuserve.com

compuserve.com

Satrosphere, Aberdeen

Tel: 012240213232

email: Satrosphere@ssphere.ifb.co.uk

ifb.co.uk

Technquest, in Cardiff

Tel: 01222 475475

email: gen@tquest.org.uk

Xperiment in Manchester

Tel: 0161 832 2244

There are 39 such centres around the UK. They vary in size and theme, so they cover not just materials but all areas of science and technology. But one thing they do have in common is, all are great fun.

To find one near you try the website: www.exploratory.org.uk/sci_cent, or drop me a line and I'll sent you a list.

Chocolate Challenge.

Aim: To investigate the thermal conductivity of materials.

Pour molten chocolate into a number of similar sized containers made of metal, polymer and ceramic. To get them all about the same size, try the glass and plastic beakers from the chemistry lab together with a metal “camping” mug. Alternatively if you are tempted to try the chocolate, then use “1 cup” kitchen measuring scoops which are available in metal and plastic and are about the same size as a ceramic mug. Add a thermometer and plot the temperature change with time as the chocolate solidifies.

- Which container allows the chocolate to set first?
- How is the appearance, internal texture (and taste?) of the chocolate affected by the rate of cooling?
- What happens if you compare milk, white and plain chocolate, (that have different fat contents)?
- How is the experiment affected by cooling the outside of the container by standing it in a water bath set at different temperatures?

Warning: Do not allow the water to get into the chocolate or the chocolate will set like rock almost immediately.

Did you know that the chocolate manufacturers use polymer moulds? They need to vibrate the mould and release any trapped air bubbles before the chocolate has solidified and if they used metal trays the noise would be unbearable as well as illegal!

The polymer injection moulding industry use metal moulds, which are more resistant to wear and cool quicker which allows them to reduce cycle times, and so increase productivity.

UCAS Education Conventions

Make the decision about which course to undertake a little easier for your pupils by recommending that they attend one of the UCAS Education conventions. There are only three nationally, one in Land the first, at Manchester Evening News Arena, is planned for late April, so sorry that we could not get details to you sooner. However, but they are very useful and will help pupils of all disciplines to make a more informed choice. What is more, they are great fun and are designed to appeal to the interests of young people.

A representative of the Institute of Materials will be present at all of the conventions to give advice on careers and courses, or just answer any of your materials related questions. So why not come and meet us in person. Additionally we have invited some of our members from the local universities and the industrial community to join us. They will be happy to discuss what materials science and engineering actually involves on a practical level.

Manchester Higher Education Convention

at Manchester Evening News Arena
(formerly known as Nynex Arena)

Tuesday, 27 April 1999
10.00 – 2.00 pm & 2.30 – 4.00 pm

Wednesday, 28 April 1999
10.00 – 12.00 pm and 1.00 - 3.30 pm

For details contact:

The Undergraduate & Recruitment Office,
The University of Manchester,
Oxford Road,
Manchester M13 9PL

Tel 0161-275 2077.

The Next Step Network Sheffield Education Convention 1999

at Sheffield Arena

Monday, 10 May 1999
9.30 am - 15.30 pm

Tuesday, 11 May 1999
9.30 am - 15.30 pm

For details contact:

The Schools and Colleges Liaison Service,
The University of Sheffield,
14, Favell Road,
Sheffield S3 7QX.

Tel 0114-222 1029.

Polymer Study Tours.

We do not just offer help for your pupils, as teachers of materials related topics we realise that you might welcome some support too. Why not make some time to attend a Polymer Study Tour. These courses take place in June and July, last one week and are **free to teachers**.

They aim to increase your awareness of the science and technology of polymers, as well as promoting careers within the polymer industry.

To get involved contact:

Napier University Edinburgh.

Colin Hindle
0131-455 2622
email: c.hindle@napier.ac.uk

Manchester Metropolitan University. 4th – 9th July 1999.

Mark Clemens.
0161-247 3342
m.clemens@mmu.ac.uk

Brunel University.

27th June – 2nd July 1999.
Dr L Gabrielson.
01895-203253
lynn.gabrielson@brunel.ac.uk

Trowbridge College 5th – 9th July 1999.

Lynda Davey
01225-756203 (Fax 777148)
lynda.davey@trowcoll.ac.uk

If you are still not sure why not have a look at p 92 of the February issue of Materials World. This article contains details of what other teachers think of the courses.

Details of the London convention were still uncertain at the time of going to press so find out the latest details from the UCAS website:

www.ucas.ac.uk/getting/uec/about/right

The Institute of Materials

Although you have decided to join the Institute of Materials through the Schools Affiliate Scheme, presumably because of what it offers you to assist with your immediate needs, you may not be so sure why the Institute of Materials exists in the first place. The Institute of Materials is a professional organisation devoted to developing and promoting all aspects of materials science. It was created in 1993 by the merger of The Institute of Metals, The Institute of Ceramics and The Plastics and Rubber Institute. Although in its present form it could be considered rather new, the individual parts that have come together to make up the present Institute of Materials, date back over 100 years.

In order to achieve its goal of promoting and developing materials science the Institute of Materials undertakes a number of activities such as

- Publishing books, journals and related documents, including *Materials World* which is free to all members.
- Organising a wide range of conferences aimed at all levels of materials understanding and competence.
- Encouraging continued professional development amongst its members.
- Accrediting schools and University courses.
- Working with other institutions within the UK, the EU and globally, to advance the interests of materials science.

In addition to the work of the Institute of Materials as a whole, there is a large membership, many of whom are actively involved, either locally or nationally, in promoting materials science.

Our goal to promote materials science is directed at all levels of understanding and ability. If you want to know more, visit our website at www.instmat.co.uk

Materials World is aimed at the whole cross section of members of the Institute of materials, and accordingly the articles may at times not be directly transferable for teaching in the classroom. However each month there will be a number of articles that we think may be particularly useful to you. Many articles include details of where to find further information, websites, and contacts, and are not necessarily loaded with scientific terminology. Sometimes these articles are immediately obvious, (“Back to School” is a bit of a give away isn’t it!), but some may get missed. Therefore, each term I will be highlighting those articles which you may find of special benefit, to make sure you continue to get the most from *Materials World* without having to wade through the less appropriate parts.

Watch out for the following:

January.

Solar Cars and the Sydney to Melbourne SunRace, p7.

Polymers on the Piste, p10.

February.

Schools get a double mention with the Schools Affiliate Scheme, p66, and the *Materials Foresight* brochure, p67.

Steel Making for Ice Cream, p67.

Making composite materials on a large scale, p78.

March.

Recycling aluminium, p133, and plastic, p137.

Biodegradable plastics, p135.

Using concrete as a roofing material, p145.

Back to School, the Pupil Researcher Initiative p169.

The Welsh Woman of the Year is a female engineer! p 170.