



Supporting practical science & technology
- in schools & colleges

Circulation list: Science and D & T				

New Year ... new CD ... new website!

By the time you read this, you should have received (or will do so soon) the 2009 CD-ROM. The CD is now also accessible through the CLEAPSS website. For more information about the website and to find out what's new on this year's CD - see the back page.

The CD is for **teachers** and **technicians** and can be copied onto a secure staff network, any computer within the science department and the home computers of science staff. This is important, especially if you can't access the website version of the 2009 CD.

Remember that the 2008 CD will stop working after January 31st so if you haven't received your 2009 CD (which will include your user name and password for the website) by half-term please contact CLEAPSS.

The Art of Practical Science

Following the success of last year's event, we are pleased to offer another exciting opportunity for up to twenty teachers to take part in a hands-on course in practical science. The course is ideal for new (or recently qualified) teachers as well as those teaching outside their subject specialism.

The 3-day course will provide all participants with hands-on tuition and practice across all three sciences. The activities have been chosen to help with the teaching of Key Stage 3, GCSE and/or post-16 courses and include:

- microbiology, aseptic technique and dissection
- radioactivity and handling radioactive sources
- physics practicals and demonstrations
- chemistry demonstrations and microchemistry
- analytical techniques and gas reactions
- health & safety - a 'practical' update

The course takes place Monday 20th - Wednesday 22nd July 2009 in our own lab here at CLEAPSS on the Brunel Science Park.

Accommodation on campus will be provided for the Monday and Tuesday nights and is included in the course price of £380 which also covers meals and refreshments.

Entry Level Award in Workplace Hazard Awareness

A young person is seriously injured in a UK workplace every 40 minutes and in the last decade, 66 under-19s have been killed at work. The British Safety Council is paying for all 14-19 year olds in full-time education to gain the BSC Entry Level Award in Workplace Hazard Awareness. To date, over 1800 secondary schools have registered for the Award with many schools entering whole year groups (normally Year 10).

The qualification is accredited in the National Qualifications Framework and is supported by free learning materials developed by IOSH and the Health & Safety Executive (HSE). Assessment is via a simple portfolio of evidence.

For more information, go to www.britishsafetycouncil.org/schools/ or call 020 8600 1033.

Is your school closing or moving premises?



As the Building Schools for the Future programme expands and more academies are planned, school closures, rebuilds and refurbishments are becoming more commonplace.

We have been very concerned to learn that, during such changes, radioactive sources and/or cabinets have been misplaced or, in some cases, even lost from schools.

As soon as the Head of Science knows that changes are ahead, he or she must liaise with the employer. Employers have a legal duty under the Ionising Radiations Regulations 1999 to ensure that a clear plan is in place for the safety, security, transfer or disposal of any radioactive materials. If you are in this situation and plans for your radioactive sources are not clear, please ring the CLEAPSS **Helpline** in good time and we will try to assist.

See www.cleapss.org.uk/download/L93.pdf to access the 2008 edition of guide **L93**. DCSF guidelines on school use of radioactive materials are available for download from... www.teachernet.gov.uk/wholeschool/healthandsafety/other/radioactive/.

How to increase your stress levels ...

... by having senior management say "we're having a new science block built"!

This is a difficult time for heads of science and technicians but at least be grateful that you are being asked for your advice and input ... many are not!

To help you, we have updated Guide **L14 Designing and Planning Laboratories**. Almost every day we get a **Helpline** call asking about the design of a laboratory and we have brought together all of the information and advice into one guide. This will be on our website and not on the 2009 CD-ROM!

Make sure you know how to access the website - see the back page.

REACH - another brief update

At this stage no action is required by *individual* schools and colleges. Keep an eye on the CLEAPSS website for news and look back at *Bulletins* 132 and 133 for previous articles.

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Using iroko in school

Design & Technology work

Sometimes when school science departments are refurbished the old iroko bench tops are discarded. Design and technology departments are often reluctant to see wood going to waste so may wish to claim the old timber for re-use in some way, for either benching or pupils' woodwork.

We are not aware of any legal restrictions on the use of iroko but some local authorities do not permit its use. The timber is also commonly used for garden furniture.

Research reveals a fairly clear link between iroko dust raised when relatively unseasoned timber is used by woodworkers and asthma / allergic skin reactions, though most reports are from industrial situations where exposure will be at a high level for much longer periods than those expected in schools. *CLEAPSS Model risk assessments for technology* sheet 1.058 mentions iroko as being potentially poisonous / allergic.

We are reluctant to preclude the use in school technology of a potentially valuable resource such as discarded iroko bench surfaces but handling this wood requires certain precautions. However, unless users can be sure that nobody will accidentally use some of it, either now or in the future, without realising its hazards - it may be better not to accept it.

A specific risk assessment should be carried out for any activity involving iroko, to include the following points:

- Pieces of iroko should be stored in such a way that people who are unaware of its hazards cannot accidentally use it.
- Individuals with known allergies or asthma should not be present when iroko is being worked on.
- Dust masks offering protection against fine dusts (eg, to FFP 2S) should be worn by all people present in the room when work is carried out on iroko.
- Dust masks should be used once only, for reasons of hygiene.
- Iroko should not be sanded by pupils, even by hand.
- Iroko should be cut or shaped only with **sharp** hand tools eg, saws or chisels. Although sawing will produce dust, this will not be as fine as that produced by sanding.
- Finishing by pupils should be confined to removal of sharp edges.

Staff preparing wood for use by children may carry out other activities for which additional precautions include:

- LEV should be used when iroko is being worked on. Dust masks (either disposable or respirators to FFP 2S) should be worn in addition.
- Any sanding should be kept to the absolute minimum eg, by first removing sharp edges.
- It is better to confine hand finishing to the removal of sharp edges.

Note also that the cost of providing disposable face masks for class use may outweigh any cost savings on using second-hand timber.

Hand in glove?

Watching programmes about forensic science on the television, it appears that gloves are 'in' but eye protection is 'out'! No doubt it is difficult to convey your emotions about your scientific investigation (and of course your smouldering love affair with the chief scientist) to the audience, if safety spectacles are worn!

It is tempting to copy these programmes but CLEAPSS trusts that teachers are insisting that eye protection is worn when needed. However, the wearing of gloves presents a problem as you never know if you have a chemical on them. Should you suddenly scratch your nose or rub your eyes, the chemical is transferred from the protected hand to the skin! We have had a number of calls about acids, alkalis and phenol getting onto faces from gloves. If the risk assessment advises gloves, do be aware of this problem! And if gloves need not be worn, then do not insist upon them. Some pupils have particular skin conditions and may have to wear gloves more frequently. More information about gloves can be found in **PS50 Gloves As Personal Protective Equipment (PPE)**.

Farewell to Kay

Kay Stephenson is leaving us in January to take up a post with the Science Enhancement Programme. Although Kay has been with us for a relatively short time, she has helped bring about a number of important developments. We are very sorry to see her go but we know that we will maintain close links with her in her new post. A longer note on her new work will appear in the summer term *Bulletin*.

Free resources from the Wellcome Trust

To mark the 200th anniversary of Charles Darwin's birth, the Wellcome Trust is providing free activities for all secondary state schools across the UK.

Survival Rivals is a series of Darwin-inspired experiments for secondary schools which provide opportunities for young people to undertake practical science.

There are three kits available in the Survival Rivals series – **I'm a Worm Get Me Out of Here** for 11-14 year olds explores natural selection, **Brine Date** for 14-16 year olds explores sexual selection and **X-Bacteria** for post-16 looks at antibiotic resistance in bacteria.

Each experiment will help young people to see the link between Darwin's ideas, modern evolutionary principles and contemporary biomedicine and will help teachers to deliver the relevant parts of the UK curricula. The kits are free to all state secondary schools within the UK and provide everything required to carry out the experiments in school. Teacher, technician and student notes will be included in the kits and online videos will demonstrate how to successfully deliver these practical enquiries.

The kits are available to pre-order now and will be sent out to schools from Spring 2009.

For more information see www.survivalrivals.org.

CLEAPSS note - schools will need an autoclave or pressure cooker for sterilising materials and disposing of cultures.

Jelly baby causes fire!

We updated our *Supplementary Risk Assessment* for the Howling Jelly Baby (**SRA 01**) in the summer to warn schools NOT to carry out the howling jelly baby experiment in a fume cupboard.

Fume cupboards (both ducted and recirculatory) simply cannot cope with the sudden amount of smoke the reaction produces and much of it is forced outside the cupboard. Recirculatory (filter) fume cupboards have an additional problem in that the prefilter becomes blocked with smoke particles which reduces the face velocity.

Teachers & technicians then think the fume cupboard isn't working.

Recently though, we heard of a recirculatory fume cupboard catching fire because sparks were sucked onto the pre-filter, which is made of paper. This damaged the main filter as well.

We have put this information in another update to **SRA 01**.

This also applies to the Thermite reaction and 'Cannon Fire' demo.

Making salts evacuates a school!

We hope you've watched *Top of the Flops* on Teachers TV in which CLEAPSS and the RSC cover experiments that go wrong or can cause serious accidents (www.teachers.tv/video/26522/).

Top of the list is '*making copper sulfate(VI) crystals from copper(II) oxide*' and CLEAPSS also receives reports of accidents involving the preparation of zinc and iron sulfate(VI) salts.

In all the incidents, dense, choking, white fumes force students and teacher from the room. The fumes are of sulfur trioxide (corrosive), formed during the decomposition of unreacted sulfuric(VI) acid and the salts, when heated too strongly. In a recent case, a school hit the BBC news when the emergency services were called to the school. After the services come the reporters and it's very embarrassing.

The method of making salts on the Teachers TV video is an adaptation of the method described in section 13 of the *Laboratory Handbook*. It is quick to carry out (about 20 minutes to get crystals) and the likelihood of unreacted acids decomposing is limited.

Tips for Technicians

It IS possible... ...to improve technicians' conditions!

We have been informed of a school where the senior technician has negotiated a technician structure in accordance with CLEAPSS recommendations. This has resulted in the whole technician team being up-graded with substantial pay increases. In this school it seems that the senior management really do recognise and have rewarded the skill and expertise of the technician team.

Other schools are urged to follow this good example and use CLEAPSS guide **L258**, *Improving technicians' conditions* to implement the recommendations contained in **L228**, *Technicians and their jobs*.

Switch Shield ...protects plugs from accidental switching off

A plastic cover that fits over the pins of a mains electrical plug before plugging it in. This prevents access to the switch on the socket to avoid it being turned off by mistake. We have tried these at CLEAPSS and believe they could be useful in schools for freezers, fridges, servers and on-going data logging, etc. They are inexpensive and usually sold in large quantities but schools may be able to negotiate with the manufacturer / supplier: Lindsey Stephens or Mary Cole, C+T Engineering Ltd, Unit 1b Oldmixon Crescent, Oldmixon Trading Estate, Weston-super-Mare, BS24 9AX, Tel: 01934 419296; Fax: 01934 636830; email: sales@ct-engineering.co.uk; www.ct-engineering.co.uk.

Ordering chemicals

Some companies may request authorisation details before supplying certain chemicals (for example, potassium manganate(VII)). If you are presented with a form to complete, state that the chemical(s) are 'for educational use only'. The company should then be able to supply them.

We also continue to receive calls about purchasing ethanol (Industrial Denatured Alcohol, IDA; used to be known as Industrial Methylated Spirit, IMS). Suppliers may ask for the reference number or a copy of the license before they supply IDA. A school already possessing a license to purchase IMS will NOT need to apply again unless the school's name, address or logo has changed or if they need to order substantially more than originally stated.

If a licence is needed, the application form can be downloaded from the *second* link to HMRC (HM Revenue & Customs) on the *Links* page of the CLEAPSS secondary web site.

The completed form should be printed on, or attached to, school headed notepaper and sent to: National Registration Unit, Portcullis House, 21 India Street, Glasgow G2 4PZ.

Unusual microorganisms

Microorganisms can be studied in schools and those listed in Table 15.2 of the *Laboratory Handbook* are considered relatively 'safe' as they are unlikely to colonise humans (provided the strict hygiene procedures described in section 15 are adhered to). We are sometimes asked about more unusual species. It is probably possible to obtain some of these but they may be expensive and require special media. Safer alternatives can often provide the same learning experience and a risk assessment should include making such substitutions.

For example, the effects of different agents on pathogens can be studied by analogy with safer microbes, and the spread of cold germs can be modelled very effectively with the *Cold Wars* activity from MISAC: www.microbiologyonline.org.uk/forms/coldwar.pdf. For CLEAPSS guidance on several published activities, see PS 34 and the PS67 series. For more original work, specialist suppliers may be able to advise on 'the best bug for the job'.

NCBE: www.ncbe.reading.ac.uk; email: ncbe@reading.ac.uk; tel: 0118 987 3743.
Blades Biological Ltd: www.blades-bio.co.uk; email: info@blades-bio.co.uk; tel: 01342 850242.

Sciento: email: sales@sciento.co.uk; tel: 0161 773 6338.

CLEAPSS Courses

Details of CLEAPSS courses, up to the May half-term 2009, are listed below. Courses marked with an asterisk* are *primarily* aimed at teachers.

Courses are open to anyone willing to travel. Contact us (ask for Alison or Caroline) for an application form or for information on how to book a place.

For more detailed and up-to-date information about courses please check our website. Information is also given on the website about the items participants may need to bring with them. **If courses of interest are not being held in your area, please contact us - we may be able to organise something.**

Course	January	February	March	April	May
Basic Chemical & General Skills	London	Southampton	Cornwall		Norfolk
Basic Physics Skills	Dartford	Keele, Southampton		London	
Making Simple Science Equipment		Wirral		Uxbridge	Swindon
Microscope Maintenance	Uxbridge		Bristol, Dartford	London	
Running a Prep Room			Oxford, Malvern, Plymouth, Surrey		Bristol
Working with Glass		Gloucestershire	E.Sussex	Solihull	London
Chemical Safety for Techs	London	Dartford, Bristol	Salford	Cornwall, Guernsey	London, N.Ireland
Practical Techniques & Skills in Chem			London, Southampton, Surrey	Bristol, Guernsey	E.Midlands, Salford, London
Fume Cupboard Monitoring		Devon	CLEAPSS		
Biology Safety				Southampton	
Microbiology		London	Bradford, Surrey, Herts	Dartford	Southampton
Physics Training for Techs			Bristol, London		Gloucestershire
Electrical Inspection & Testing	E.Midlands, B'ham, Dorset		Devon, Stevenage	Stevenage	Southampton
*Radiation Protection Supervisors	E.Midlands, London, Bolton	N.Yorks, Bexley, Kent, Durham, Newbury	Bristol, London	Sheffield	Gloucestershire, Leicester, Nottingham
Health & Safety for Technicians	London		Southampton	Durham	London, Bristol
*Health & Safety in Practical Science					
*Health & Safety Management	N. Ireland, Staffs		Cumbria, Southampton		
*Safe-Exciting Classrm Chemistry		Bristol, E.Midlands, Keele	Durham, Herts		Keele
*Surely it's banned!/Micro Chemistry ^B	Southampton ^B	Devon ^A , Keele ^B	Southampton ^A , Durham ^B	Bristol ^B	
ASE 2009 Annual Conference	Reading				
The D&T Technician					
D&T Workshop Maintenance					
*H & S Management in D&T					Norfolk

CLEAPSS Publications

New publications

The 2009 Science Publications CD - What's new?

The *Science Publications* CD 2009 edition has now been issued. It is now also available via the CLEAPSS website under the title 'Secondary Resource' and replaces the 'members only' area. It is searchable and documents can be downloaded as required. The online version has the advantage that it can be updated as soon as we produce or update our guidance. You need the new 2009 login details... Username = hydrogen Password = x4a7b3k2 Please go to www.cleapss.org.uk/cdromfaq.htm for FAQs.

- Laboratory Handbook:** Sections 1 (Reference Lists), 12 (mainly Physics) and 20 (Reference tables) have been updated. More significant changes will be made to some of the other sections (e.g. Section 7 Chemicals) will be made during 2009. New versions will be available on the CLEAPSS website.
- Guides:** R151, L93, L250, L257 and L258 are the new or revised guides since last year.
- Guidance leaflets:** Many of our PS series of guidance leaflets have been revised and several new ones produced, since the last CD-ROM was issued. New guidance leaflets include several in the PS67 series: PS67-13 *The movement of ions*, PS67-14 *Chromatography* and PS67-15 *Amino acids*. PS69 *Banned chemicals and other myths* has also been updated. Other new guidance leaflets include:
 - PS80 *How to use a model steam engine*,
 - PS81 *Fireworks and explosives*,
 - PS82 *Using laboratories for non-science activities*.
- Hazcards:** Everyone should by now have received and be using the 2007 edition of the Hazcards. A few more changes have been made since the paper version was printed. Guidance leaflet PS35 details the amendments and you should make sure that you update your own set(s) of *Hazcards*.
- Student Safety Sheets:** No major changes made.
- Supplementary Risk Assessments:** SRA 01 *The howling jelly baby* has been updated to make it clear that this experiment should not be done in a fume cupboard.
- E-documents:** No major changes.
- Customisable documents:** DL93 has been amended to match the revised publication.

Free publications

Items listed here are free of charge because they are new or have been revised since December 2008 and are not on our CD-ROMs. They are also available to download from our website. There is a link to this on the *Science Publications* CD-ROM. A few publications can be downloaded from the public part of our website.

Free publications - continued

All of our other publications are no longer listed here because they are on our *Science or D&T Publications CD-ROMs* (which have been issued to schools). See our website for a list of all of our publications.

- L253 Managing Risk Assessment for D&T (07/06)
- L254 H&S maintenance of D&T Workshop Equipment (06/06)
- L260 Model Health & Safety Policy for D&T Department (05/08)

- DL260 Model Health & Safety Policy for D&T Department (05/08)

- PS31 Disposal of Waste in Technology (01/06)
- PS62 LV in D&T: Suppliers, Testers & Monitoring equipment (05/05)
- PS65 Immediate Remedial Measures for D&T (03/07)
- PS68 D&T Class Sizes, Room Sizes and Safety (07/06)

Publications for sale

CLEAPSS 2009 Science Publications CD-ROM <small>[Expires Jan 31, 2010]</small>	One issued free; Additional CD: £8.50
Hazcards - 2007 edition	One set issued free; £10.00 per set (1-4 sets) £ 9.50 per set (5-9 sets) £ 9.00 per set (10+ sets)
Recipe Cards (2007 update of 1999 edition)	£ 5.00 per set
Student Safety Sheets (2007 edition)	£ 3.50 per set
CLEAPSS Laboratory Handbook	£34.00 (2 binders + all pages) £25.00 per set (pages only) £ 4.50 (binder) £ 1.50 (per chapter) £ 5.00 (2007 updated pages)
Guides (L- and R- series)	£ 1.00 each
Guidance Leaflets (PS- series)	£ 0.25 each
CLEAPSS D&T Publications CD-ROM	One issued free; Additional CD: £11.00
Model Risk Assessments for Design & Technology	
Part 1 For work with resistant materials	£ 5.00
Parts 2 & 3 For work with compliant materials & with foods	£ 5.00 (not available separately)
Parts 1, 2 and 3 combined	£ 9.00

Hazardous Chemicals CD4 (SSERC): For A-level work. CLEAPSS members and associates can buy this CD-ROM at the reduced price of £40.00 (or £20.00 if hard-copy or CD 1/2 already purchased). Contact CLEAPSS for details.

Handling charge, per order	£ 1.50
Minimum order charge (cheque with order)	£ 2.50
Minimum order charge (by invoice)	£ 5.00

(Postage included except for orders from overseas; contact us for charges)

You can order items by letter, phone, fax, e-mail or from our website. Please print your name clearly, give your address and the name of your Local Authority, if applicable. You can copy this page and mark the items you need.

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Please complete the form below using BLOCK CAPITALS and a black pen, if faxing this page to us.

Name School/College

Address

.....Postcode Tel Fax

Local authority (if applicable) Associate member (Please tick if applicable)