CLEAPSS BULLETIN 118

For all technicians and teachers of science and design & technology

Autumn term 2003

Circulation list			

CLEAPSS

SCHOOL SCIENCE SERVICE

Goodbye to John

John Oldham retires from CLEAPSS in September. He has been with us for 10 years, working part time. Before that he was an Ofsted inspector and science adviser in Hounslow and Waltham Forest, having taught in London schools. With us, John has specialised in special needs and primary work, as well as some biology. He was the main author of such publications as the *Shorter Laboratory Handbook* and guides L77 and L227 on science for pupils with special needs and stick insects. He also has outstanding skills with computer graphics packages and was responsible for the E-files on the *Science Publications CD-ROM*, E229 *Illustrations of Basic Laboratory Equipment* and E223 *Common Safety Signs and Hazard Symbols*. His calm, thoughtful approach will be greatly missed. John thinks he is going to spend more time messing about on his boat on the Hamble river but we have other ideas and intend to continue to use his skills, albeit at a distance. We wish him well in his 'retirement'!

CLEAPSS CD-ROMs

All D & T departments should by now have received their free copy of the *Design & Technology Publications CD-ROM*, despatched last term. We would be grateful if science departments could check with their D & T colleagues.

The current *Science Publications CD-ROM* (by now, there surely cannot be a department that has not received this?!) will stop working at the end of January next year. However, by then you should have received a replacement. On the new CD-ROM, to be sent out later this term, will be our *Recipe Cards* and *Student Safety Sheets* and, hopefully, all our Guides that are currently in print. Parts of the existing *Laboratory Handbook*, *Hazcards* and *E-documents* will also have been updated. Look out for the new CD-ROM; please store it in the case that you already have.

A feature of the current science CD-ROM is the password it contains to allow members access to the secure part of the CLEAPSS web site. Here there are back copies of the *Bulletin* and all the latest versions of our PS series of information leaflets. In addition, there are a variety of customisable files. It is our intention to include on the next CD-ROM most, if not all, of the existing material on the web site, to facilitate accessing any CLEAPSS guidance. It will then only be necessary to visit the web site to obtain the very latest newsletters, updates etc.

Clearly, the CD-ROM is a boon for technicians but we hope that science teachers are also finding that it is an indispensable aid. The CD-ROM can be installed on a school's network and on individual teachers' lap-top or home computers but *must not be copied to non-members*.

Unilab equipment

Schools have complained of the disappearance of Unilab items from the Philip Harris catalogue. Worry not! Unilab products are now in a *separate* catalogue. If you failed to receive the catalogue, sent to all schools, ask for a copy now! Tel: 0845 120 4521.

A career structure for science technicians

In *Bulletin* 117, we reported that a project had been set up to help develop a career structure for technicians. This was taking place in the context of work that the DfES and the National Joint Council (NJC) for Local Government Services were carrying out on school support staff generally. In its consultation a few months ago, the DfES had proposed three career progression routes: pedagogical, behaviour/guidance and administration/organisation. CLEAPSS, ASE, the Royal Society and others suggested a further route: curriculum support, and this has been taken up by the NJC. Most science technicians would follow the curriculum-support route but, if they work significantly in the classroom, might transfer to the pedagogical route.

At the time of writing, the project report had not been finalised but it is likely to include several key recommendations, or something similar, which are quoted below.

- A 4-level career structure for science technicians should be adopted which complements that being developed by the NJC. Job descriptions could be based on those given in the CLEAPSS Guide L228. Further discussions would be held with head teacher and technician unions to strengthen the consensus.
- Job evaluation, to establish at what level a technician is working, should be undertaken professionally, following negotiations with employers and union representatives. The proposed four-level career structure in L228 should be used as a framework for the grade assigned to individual posts.
- The relationship, equivalence and transferability between levels of the four career progression routes for school support staff should be clarified. Technicians following the curriculum-support route should be able to access the level 4 pedagogic route where applicable.
- NVQs at levels 1 to 4 should be developed which relate to, and fully support, this structure, building on the guidance in CLEAPSS Guide L234.
- The DfES should fund the establishment of a technician assessment and support centre to develop a distance- / e-learning approach for technicians wishing to progress up the levels.
- The National Network of Science Learning Centres should be encouraged to run courses for technicians which complement and extend existing provision and support the structure.
- In addition to the general introductory training programme being developed by the DfES for school support staff, teaching assistants working in science, including, where relevant, technicians, should have the opportunity to undertake appropriate specialist modules depending on their existing expertise and previous experiences.
- The DfES, schools and LEAs should seek to maintain the appropriate level of trained technical (non-teaching) support for science, especially where technicians become increasingly involved in pedagogic support for science classes.
- A leaflet, outlining technician career progression, should be distributed to schools, LEAs and policy makers in autumn 2003, following discussion with the NJC and various unions.

New Publications

pH measurement

We have recently updated and extended guide R35 on pH measurement using meters, indicators etc. Instruments at the 'bottom' end of the market were surveyed and some of the least expensive models are particularly recommended. Maintaining pH probes in good condition remains the crucial aspect of obtaining reliable pH readings.

Magnifiers and simple microscopes

Our new guide R24x, *Magnifiers & Low-power Microscopes*, complements guide R24s and surveys equipment for observing specimens, mostly up to about x20 magnification. Hand lenses, digital microscopes, stereobinocular and other instruments are included.

Safer chemicals, safer reactions

Guide L195, *Substitute Chemicals*, has been replaced by one with the above title - emphasising the strategy we are now taking to make chemistry teaching safer. The new guide still discusses alternative chemicals but also includes a variety of new techniques, many of them micro-scale, to provide a safer way of approaching familiar procedures. Suitable molarities are also suggested for the solutions needed to carry out various chemical reactions.

Electronic balances

As the first part of revised guidance on the purchase of electronic balances, we have issued PS63, listing suppliers and manufacturers.

Dangerous substances? Handle with care

The European Week for Safety and Health 2003 is an initiative organised by the European Agency for Safety and Health at Work in Bilbao, Spain. This year's Week is on the prevention of risks from dangerous substances (ie, chemicals and other hazardous substances). Within the UK, the Health and Safety Executive promotes the Week, which begins on 13 October.

CLEAPSS supports this campaign and would like to draw members' attention to it. All participants who let HSE know what they did during the Week will receive a personalised certificate and some are selected for awards. This may be of particular interest for students following the Applied Science GCSE course, with its emphasis on health & safety.

Details can be found by linking to www.hse.gov.uk/euroweek. A newsletter and action pack can be ordered or downloaded from this web site or by contacting the HSE InfoLine: 08701 545 500.

IST technician job vacancy list

The Institute of Science Technology (IST) is a professional body for all science technicians working in education as well as health, pharmaceutical and other industries. On its web site, www.istonline.org.uk, under the heading Training/Jobs, there is a job vacancy page for all science technicians. The service is available to IST members ***and*** non-members and it is a simple process to send an advertisement to the list, along with attachments such as information, job descriptions, application forms, etc.

At present it is envisaged that the jobs will stay on the list until the closing date for applications. There is an introductory offer of one free advertisement with a £100 fee for subsequent adverts. We do not know when the introductory offer expires but, after this period, the cost is likely to be around £200 per advert. This appears to be significantly less than the cost of advertising in many national publications.

There are currently only a few vacancies on the list but, if technicians regularly browse the site and employers are encouraged to use it, the IST list could become the best means of advertising vacancies nationally. (The lack of a recognised national publication or other medium for advertising school/college technician vacancies is discussed in our guide L228, section 9.)

Using the Intel microscope?

Schools using the QX-3 computer microscope (issued free to establishments in England) sometimes report problems. The web site: www.intel.com/support/intelplay/qx3/index.htm provides help with compatibility and other issues and has some updated software downloads. For those wishing to use the QX-3 on an Apple Mac running system OS X, there is a free software download at http://homepage.mac.com/aireck/qx3/index.html. Go to our web site for these, and other, links (click on the 'Links' button).

Computers in the prep room

It has become increasingly necessary for science technicians to use computers to perform many of their duties efficiently. We have frequently suggested that if technicians do not have their own computer in the prep room (with Internet access), a bid should be made for a suitable machine (not a cast off from other departments!) as soon as possible.

So, you have made your bid but, as a new term starts, you still have no computer. What can you do? Start by reaffirming your need for a computer to access up-to-date health & safety information on the Internet and CD-ROMs. Increasingly, materials are available in electronic format and, in some cases, only accessible electronically. Explain that a computer will increase your efficiency in routine administration, producing and maintaining stock lists, cataloguing, communicating, producing labels, etc. Use relevant material to back up your claim (for instance, the *Laboratory Handbook* section 8.4.3, Guide L228 section 8.3.1, Guide L234 section 5.1 and CLEAPSS *Bulletin* 116, page 1 *Electronic Publications* article). Wave the *CLEAPSS Science Publications CD-ROM* at anyone with any money! (And also use the information in the article on page 1 of this *Bulletin* to remind others how increasingly valuable the CLEAPSS CD-ROM will become.)

Also discuss the matter directly with staff in the IT department, since they will be able to advise you about the specifications required and how much to budget for. If the budget is the problem, then they may also be able to suggest a cheaper solution that will still match your requirements, such as a special offer, end-of-line or discontinued model, reconditioned or 'bare-bones' system. It is essential that the IT department is on your side, as its staff should provide you with the software, support and training that you need, once you actually have a computer.

Failing all this, perhaps it is time to accept a cast off as a ***temporary*** measure. It will establish that you *do* need a computer, Internet connection and suitable training. You can then demonstrate how slow the computer is and/or its limited capacity in performing the necessary tasks, and demand a new replacement!

Hazcard updates

The hazard classification of zinc sulphate has been changed; previously deemed non-hazardous, it is now IRRITANT and also DANGEROUS FOR THE ENVIRONMENT. Please make alterations to *Hazcard* 108. The hazard rating of dibutyl phthalate (mentioned on *Hazcard* 64, *Methyl Benzoate*) has also been revised. Because of effects on the unborn child, it is now classified as TOXIC.

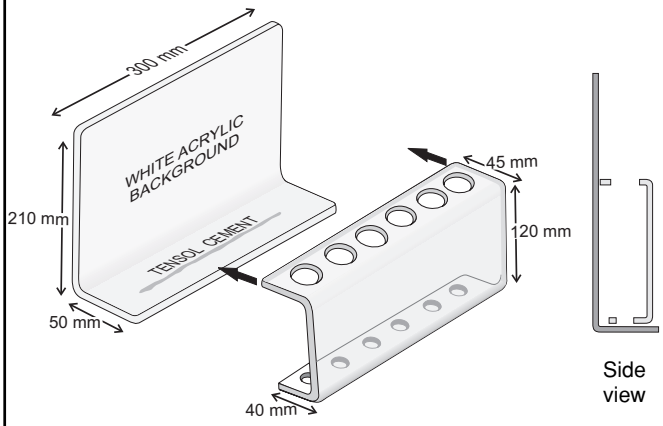
This has necessitated substantial changes to *Hazcard* 64. Revised *Hazcards* 64 and 108 will be included on the new CD-ROM, coming this term, from which you will be able to print out the revisions. In the meantime, the revised cards can be obtained by downloading PS35 from the secure part of our web site.

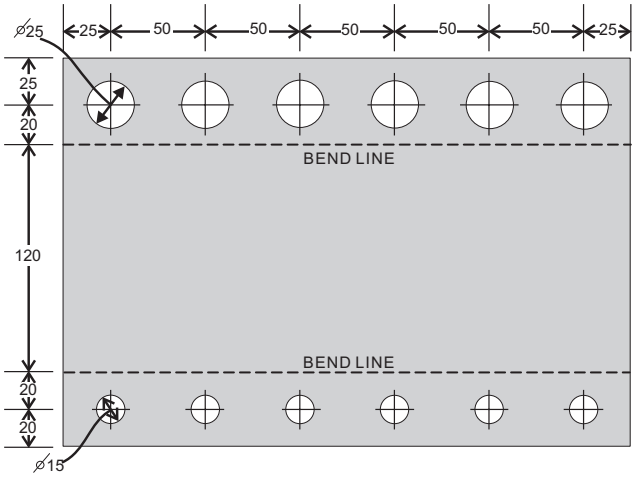
Tips for Technicians

A demonstration test-tube rack

Here is a design for a d-i-y test-tube rack which will more clearly show to students the colours of various solutions. It is made from two pieces of 3 mm acrylic sheet; one is transparent while the other is white, providing a background against which samples are observed. Dimensions for cutting and drilling are given in millimetres on the drawings below.

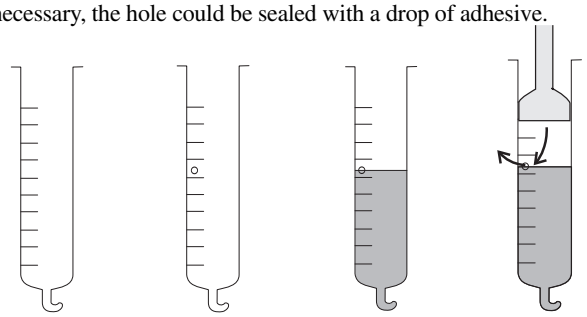
The acrylic is bent using a strip heater which your Design & Technology department should have. The clear 'rack' component is glued to the back sheet using an acrylic cement, eg, *Tensol*. If alternative backgrounds are required, coloured card can be inserted temporarily.





Sealing syringes

Some teaching schemes, eg, *Eureka*, require sealed plastic syringes containing sand, air and water. Those with sand and air are relatively easy to seal by melting the nozzle but, with water in the syringe, the plastic does not melt onto itself to form a seal. To overcome this problem, briefly heat the nozzle of an empty syringe in a Bunsen burner flame and safely squash the softened plastic to seal it. Using a very fine drill bit or an optics pin, make a small hole about half way up the barrel. Fill with water up to the hole. Insert the syringe plunger and gently expel the air until the hole is just blocked by the plunger. If necessary, the hole could be sealed with a drop of adhesive.



Reusing plastic containers

A technician has told us about the 5 litre containers in which 'Ariel Hydroactive' washing liquid is supplied (available from large stores such as Makro and Costco). When the liquid has been used up, the containers are very useful for keeping stocks of distilled water, dilute reagent solutions etc. Made from opaque HDPE, the containers have two stable positions: upright, for filling and storing and horizontal, for dispensing the contents.

The containers are filled (using the funnel supplied) through the top, which has a standard screw cap, and the contents dispensed via a wine-box style tap (with the screw cap loosened to prevent 'splutter'). The containers in which 'Finish' dishwasher powder is supplied are also handy for small quantities of cat litter for lab spills.

CLEAPSS courses coming soon

Details of our courses, up to half term in February 2004, are listed below. Most sessions are for *technicians*, unless otherwise indicated.

Basic Skills, General & Chemical: East Sussex.

Biology Safety: Doncaster; Hampshire.

16 Banned Chemistry Experiments (Teachers/Techs): Norfolk; Sheffield.

Chemical Handling I: Cumbria; Dudley; Norfolk; Salford; Stoke-on-Trent; Tower Hamlets; Wiltshire.

Chemical Handling II: Rhondda-Cynon-Taff.

Beginning in Electricity**:** Bristol; Harrow; Salford; Surrey.

Electrical Testing: Bromley; Coventry; Hertfordshire; Kingston-upon-Thames; N E Lincolnshire; Suffolk; Warwickshire.

Fume Cupboard Monitoring: at CLEAPSS.

Health & Safety: Barnet; Darlington; Denbighshire, Conwy & Flintshire; Devon/Dorset; Essex; Gloucestershire; Havering; Lincolnshire**;** Oldham; Sheffield; Shropshire; Suffolk; Wakefield; Worcestershire.

Health & Safety Risk Assessment (NQTs and others): Barking & Dagenham; Pembrokeshire.

Health & Safety Management (Heads of Science): Essex; Harrow; Lincolnshire; Oldham.

Microbiology: Kent.

Microscope Maintenance: Kirklees; Norfolk; Oxfordshire; Salford.

Physics Topics: Liverpool; Newport; Shropshire; Wirral.

Radiation Protection Supervisors (Teachers): Cornwall; Monmouth; N Ireland; Wokingham.

For the most up-to-date information on courses being offered, visit our web site; this indicates the items that participants should bring with them for a particular session. Courses are usually publicised to schools and colleges in the immediate locality of the host establishment but are open to anyone willing to travel. Contact us (ask for Alison or Caroline) for an application form or, for an LEA-organised course, for details of the LEA contact person. For such courses, you will need to book directly with the LEA. Some will give priority to their own schools. ***If courses of interest are not being held in your area, please contact us; we may be able to organise something.***

CLEAPSS PUBLICATIONS

Free guides and other materials

Guides marked '**R**' mainly contain retail information about the cost and availability of resources; other guidance may be given. For help with buying items ***not*** covered by a listed guide, please call our ***Helpline***. Guides marked '**L**' cover specialist topics, items written since the relevant section of the *Laboratory Handbook* was completed and other information; details of equipment may also be included. Publications marked '**PS**' are brief documents, often updated, that outline our views on topics of current interest. (Check dates; these may indicate a revision.) ***All PS publications are now on the secure part of our web site.***

Note: Some of our older or less-popular items are *not* listed here. Details are on our web site, as is a copy of the *Bulletin* index.

General Equipment, Labs, Management, Safety

R9a FUME CUPBOARD DATA SHEETS (Feb '01)
L14 DESIGNING & PLANNING LABORATORIES (Mar '00) (+ PS14)
☆R35 pH MEASUREMENT (New; see p. 2)
R45 VACUUM PUMPS (Dec '98)
R57 COLORIMETERS (May '00)
R59a GENERAL-PURPOSE L-V POWER SUPPLIES (Apr '03)
L77 SCIENCE FOR PUPILS WITH SPECIAL NEEDS (Jan '00)
☆L103 EQUIPMENT REPAIR (Apr '99) [Sent with lists of repairers: PS40 (Jun '03); PS41 (Jun '03), PS42 (Jun '03), PS43 (Mar '03)]
R135 EYE & FACE PROTECTION (Apr '98)
L164 PORTABLE LABORATORY GAS BURNERS (Sep '95)
L196 MANAGING RISK ASSESSMENT IN SCIENCE (Jul '97)
L214 EXAMINING AUTOCLAVES etc (Aug '00)
L216s INSPECTING SAFETY in SCIENCE (Sep '96)
L223 MODEL SCIENCE HEALTH & SAFETY POLICY (Jul '98)
L228 TECHNICIANS & THEIR JOBS (Dec '02)
L234 INDUCTION & TRAINING OF TECHNICIANS (Feb '03)
PS7 CENTRIFUGES (Sep '97)
PS9 SCIENCE CLASS & LABORATORY SIZES: SAFETY (Apr '01)
☆PS14 LAB FURNITURE & FITTINGS (Jun '03) For use with L14.
PS16 BUNSEN BURNER TUBING (Jan '02)
PS21 HEALTH & SAFETY IN LABORATORIES and NQTs (Oct '02)
PS24 AUTOMATIC DISHWASHERS (Jan '03)
PS25 RISK ASSESSMENTS: LAB TECHNICIAN ACTIVITIES (Jun '03)
PS30 MONITORING SCIENCE SAFETY POLICIES (Jul '00)
PS38 TRAINING FOR SCIENCE STAFF etc. (Oct '02)
PS44 THE CASE PROJECT: SAFETY & RESOURCES (Oct '02)
PS45 REFILLING CARBON DIOXIDE CYLINDERS (Jan '03)
PS47 CLEAPSS SERVICES FOR TRAINEE TEACHERS (Mar '03)
☆PS48 FUME CUPBOARD TESTING CONTRACTORS (May '03)
PS49 FIRE RISK ASSESSMENTS FOR SCHOOL LABS (Feb '02)
PS50 GLOVES AS PERSONAL PROTECTIVE EQUIPMENT (Sep '01)
☆PS51 THE QUALITY OF TEST TUBES (Jul '03)
PS54 WATER FITTINGS (Mar '03)
PS56 DATALOGGING EQUIPMENT (Oct '02)
PS58 OPEN EVENINGS & PRIMARY SCHOOL LIAISON (Sep '02)
PS61 CONTRACTS FOR DISCOUNTS; EQUIPMENT SUPPLIERS (Dec '02)
☆PS63 ELECTRONIC BALANCES: MANUFACTURERS/SUPPLIERS (Aug '03)
☆INDEX CLEAPSS BULLETIN INDEX (For issues 77 - 118)

Design & Technology

L225 LEV IN DESIGN & TECHNOLOGY (+ PS62) (Mar '03)
PS31 DISPOSAL OF WASTE IN TECHNOLOGY (Mar '01)
PS33 MDF (Medium Density Fibreboard) (Jul '00)
PS53 3 METHODS OF ETCHING COPPER-CLAD BOARDS (Sep '01)
☆PS62 LEV in D&T: Suppliers, Testers, Monitoring equipment (Jun '03)

Mainly Biology

R24s BUYING MICROSCOPES for secondary schools (Jul '02)
☆R24x MAGNIFIERS & LOW-POWER MICROSCOPES (New; see p. 2)
L52 SMALL MAMMALS (Apr '94)
L71 INCUBATING & HATCHING EGGS (Mar '97)
R101 EQUIPMENT FOR STEAM STERILISATION (Apr '01)
L197 GIANT AFRICAN LAND SNAILS (Apr '92)
L201 GIANT MILLIPEDES (Dec '92)
L206 TADPOLES (Sep '94)
L213 SCIENCE WITH MINIBEASTS: SNAILS (Sep '95)
L221 DEVELOPING & USING ENVIRONMENTAL AREAS (Dec '98)
L226 CARNIVOROUS PLANTS (Nov '01)
L227 STICK INSECTS (Dec '02)
PS1 POND DIPPING & WEIL'S DISEASE (Mar '96)
PS2 THE DISSECTION OF EYES (Feb '01)
PS3 USING ANIMALS & PLANTS: Formulating a policy (Mar '96)
PS6 CHEEK CELL SAMPLING (May '96)
PS10 BURNING PEANUTS and ALLERGIES TO NUTS (Mar '03)
PS11 HUMAN BLOOD SAMPLING (Oct '99)
PS27 HUMAN BODY FLUIDS (Jun '97)
PS34 MICROBIOLOGY WORK IN *SPOTLIGHT SCIENCE* (Jun '02)
PS55 BRINGING PETS and other animals into schools (Apr '02)

Mainly Chemistry

☆L195 SAFER CHEMICALS, SAFER REACTIONS (New; see p. 2)
L202 SPECTRA (for various organic substances) (Sep '00)
L215 MICROSCALE ORGANIC CHEMISTRY (Jan '96)
☆PS35 *HAZCARDS* UPDATE 2003 (Aug '03)
PS57 *RECIPE CARDS* UPDATE (Oct '02)

☆ New or updated items

Mainly Physics

R82 ELECTRONIC METERS (Apr '99)
R92 MEASUREMENT OF RADIOACTIVITY (Feb '01)
L93 MANAGING IONISING RADIATIONS etc (Aug '01)
L194 EARTH IN SPACE: KEY STAGES 3 & 4 (Jul '99)
R231 GAS LAWS: Experiments and Apparatus (Jul '02)
PS28 RADIANT HEATERS IN PHYSICS (Sep '00)
PS52 LASERS (Aug '01)

Materials for which there is a charge

CLEAPSS Science Publications CD-ROM
One issued free; Additional CD: 3-year subscription £30.00

CLEAPSS Laboratory Handbook
Binder £4.50; Binders (two) + all contents £27.00;
6th issue (2001) £6.50; Individual chapters £1.50 each

Note: **One** binder needed if existing binder is too full. **Two** binders required for all Handbook contents.

CLEAPSS Shorter Laboratory Handbook
Binder + all contents £13.50 For use in middle, prep & some special schools and pupil referral units.

Hazcards 2000 update of 1995 edition
1 or 2 sets £9.00 per set; 3 - 9 sets £8.50 per set; 10 + sets £8.00 per set

Recipe Cards 2002 update of 1999 edition £3.00 per set

Student Safety Sheets (Combined issue 2003) (**NB** New sheets to download from web site)
For establishments that need a further set. £4.00

CLEAPSS D&T Publications CD-ROM
One copy issued free; Additional CD: £12.00

Model Risk Assessments for Design & Technology
Part 1 For work with resistant materials £5.00
(For extra sets of revised part 1 pages, send stamps valued 44p.)
Parts 2 & 3 For work with compliant materials and with foods (*Not available separately*) £5.00
Parts 1, 2 and 3 combined £10.00

Cheques with orders please for all priced publications, if at all possible.

Hazardous Chemicals CD2 **(SSERC)**
For A-level work, CLEAPSS members and associates can buy this CD-ROM at the reduced price of £80 [£40 if hard copy or CD1 already purchased]. *Contact CLEAPSS for details.*

You can order items by letter, phone, fax, e-mail or from our web site.

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***E-mail:* science@cleapss.org.uk**
***Web site:* www.cleapss.org.uk**

Please print your name clearly, give your address and the name of your LEA, if applicable. You can copy this page and mark the items you need.

Please complete using block capitals, and a black pen, if faxing this page to us.

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