



Science handbook...health and safety policy

Introduction

Safety Policy for teachers (full health and safety follows)

Use of ionising substances

- Local rules for closed sources:
- Record the times of removal and return each source to and from the store in the 'use log book'. The log book must be kept with the sources.
- Carry each source in its box and keep it there until it is required.
- Use only one source at a time in any one experiment.
- Handle all closed sources with a tool which keeps the fingers at least 10 centimetres from the active region.
- All sources must be inspected by the person in charge on return.
- If any source is dropped, thought to have been damaged or missing it must be reported to the RPS (Radiation Protection Supervisor) immediately.
- No work with Thoron or Proactinium sources is to be carried out.
- Pupils may not use the sources; all work must be Teacher/Technician demonstration only.
- The Sources must be stored in accordance with DFE guidelines.

Use of goggles/safety glasses/screens/fumes/cupboards.

Safety glasses

- Eye protection must be worn whenever there is any risk to the eye. Situations in which eye protection must certainly be worn include:
- All heating operations.
- All chemical reactions which are exothermic.
- All occasions on which acids or alkalis are handled.

- All occasions on which harmful, irritant, flammable, toxic or corrosive chemicals are handled.
- All occasions on which there is a mechanical risk to the eyes (e.g, when chipping rocks, stretching nylon monofilaments etc).
- Eye protection should be worn by pupils and teachers when the latter are demonstrating experiments in the above categories.
- Teachers need to remind their pupils that eye protection is necessary at the start of each piece of practical work and be prepared to remind them continuously throughout the lesson. The teacher's own example is of paramount importance. Pupils who are not themselves carrying out practical work may still need to wear eye protection, if others in the laboratory are doing so. Failure to wear eye protection when it is necessary should be regarded as a serious disciplinary offence.

Safety Screens

- There are a number of occasions when it is necessary to protect both pupils and teachers by the use of safety screens. Such occasions include:
 - The generation or handling of hydrogen (other than on a test tube scale).
 - Violent reactions, e.g, The thermit process.
 - Demonstrations of a power transmission line or other occasions when screening is necessary to prevent inadvertent contact with a live conductor at mains voltage.
 - In many situations a single protective screen will be insufficient, the demonstration will need to be surrounded by screens.
- During the demonstration of a potentially violent chemical reaction, the teacher and pupils will still need to wear individual eye protection, even when safety screens are in use. In addition, pupils should be seated two metres away from the demonstration bench.

Fume Cupboards

- There is a modern fume cupboard in various science labs and this should be used when teachers are demonstrating reactions using toxic gases, volatile chemicals which give off toxic vapours, reactions which produce toxic gases, eg, displacement reactions in the halogens.
- If teachers are not sure when to use fume cupboards refer to the CLEAPSS Hazcards.

Reporting Accidents

A note of all accidents which occur in school should be made in the Accident Book which is kept in the General Office.

Reporting potential hazards

Potential hazards should be reported on the Science Department 'potential hazard report' form and given to the Senior Science Technician who will inform the relevant person(s) and later check that the situation has been rectified.

Reporting breakages and dealing with broken glass

Breakages should be reported on the Science Department 'breaking report' form. The completed form should be given to the Senior Science Technician who will determine the replacement cost of broken items.

In the event of items being broken as a result of malicious damage the department may take steps to recover the cost of replacing items from pupils or their parents. In the event of a pupil damaging a major item of equipment the department will ascertain repair replacement costs and inform the over-sighting deputy head to determine what further action should be taken.

Many accidents in school laboratories involve broken glass resulting in minor injuries to pupils. Accidents can be avoided if pupils are given proper training when handling items made of glass. Breakages frequently arise when a stopper or bung is being inserted in a test tube or when glass tubing or thermometers are being inserted through a cork or bung. Safe ways of carrying out these operations need to be taught. Broken glass should be cleared up by the teacher or technician and disposed of in the 'glass' waste bins. There should be a clearly labelled bin for such purposes in each laboratory. Broken glass should not be put in the general waste paper bin.

What to do in an emergency

In the event of an accident, if possible, the person concerned should be escorted to the medical room and assistance should be sought from the General Office.

If an accident happens in a laboratory, first aid may not be immediately available and teachers and technicians must be willing and able to take emergency action.

Chemicals on the skin should be washed off with copious quantities of water, ignoring any mess. Burns, whether from heat or chemicals, also require flooding of the afflicted area with cold water for 10 minutes or more. Even chemicals that react exothermically with water, e.g, concentrated sulphuric acid, alkali metals, can be treated in this way provided that the quantity of water used is sufficient to ensure that any heat generated has a negligible effect on water temperature.

- The designated first aider for the Science Department is _____ (Senior Science Technician).

- In the event of a small fire the CO₂ fire extinguishers located in each laboratory can be used. They are suitable for use with:
- Small class A fires (wood, paper, cloth etc).
- Class B fires where contamination needs to be avoided (liquids, fats, petrol, oil etc).
- Class C fires (electrical).
- In the event of a serious fire the school's fire procedures must be followed: see (G) fire procedures.

Emergency procedures

If a major spill of a fuming substance occurs, the staff will ask the fire service to deal with it, warning it that breathing apparatus will be needed.

These numbers are displayed near the telephone[s]:

Emergency	Body	Telephone number
Serious accident	Ambulance First aider [Safety officer]	999 (Internal)
Chemical spill	[CLEAPSS] [SSERC] [Science adviser] [Head of department]	01895 251496 0131 558 8180 (Home)
Radiation accident	Hospital RPA	
Animal welfare	Veterinary practitioner	

School injury reporting procedure

Following an injury, so that the Regulations (RIDDOR) can be complied with, the accident must be reported to head of department or a School First Aider report form must be returned to head of department, attached procedure must be followed as quickly as possible.

Fire Procedures

Whoever discovers a serious fire in the department should sound the alarm and notify the General Office and/or the Head or a Deputy. The General Office will summon the fire brigade on the instruction of the Head, Deputy or senior member of staff on site. Fire alarms are located on each floor.

If teaching in a laboratory when the fire alarm sounds the teacher should ensure that all gas taps and electrical equipment is switched off before vacating the room. If there is time windows should be closed. The class should leave the building **IN SILENCE, WALKING QUICKLY** by the nearest exit and proceed to the assembly points in the playground.

What to do if hazardous gas or vapour escapes

If hazardous gas or vapour escapes in a laboratory the teacher should open the windows in order to ventilate the room. Pupils and staff should evacuate the room immediately. The Senior Science Technician should be informed and he/she can ascertain if further action is necessary to deal with the problem in the laboratory.

Teachers should be prepared to seek medical help for children suffering from asthma or other respiratory problems.

Use of laboratory coats/protective clothing

Laboratory coats are not provided for pupils; the department has a supply of aprons which can be used by pupils in practical lessons. We also have a supply of disposable aprons but these are only suitable for a limited range of uses.

Teachers should set a good example and wear laboratory coats when dealing with corrosive liquids, heating solids and liquids, or dealing with micro-organisms. Disposable gloves are supplied for teachers when they are handling materials that are potentially hazardous.

What to do if there is a spillage of a hazardous liquid

Acids

- Eliminate all sources of ignition and instruct all staff and students to leave the room. Open the windows to ventilate the area.
- Deal with the spillage wearing a laboratory coat, gloves and eye protection.
- Spills of concentrated acid evolve irritating and harmful fumes. It is important to have the room well ventilated. Since the reactions will produce heat it is vital to leave time for this heat to dissipate.
- Cover the spillage with solid sodium hydrogen carbonate or soda ash. Work the mixture into a slurry.
- Carefully scoop up the slurry and wash it down the drain with a vast excess of water. Wash the area well.

Flammable Solvents

- **Eliminate all sources of ignition and instruct all students and staff to leave the room.**
- **Open windows to ventilate the area.**
- **Deal with the spillage wearing a laboratory coat, gloves and eye protection.**
- **If a small spillage has occurred, absorb the spillage onto paper towels and allow the liquid to evaporate in a fume cupboard. Burn the paper.**
- **For a larger spillage, absorb the liquid on to sand, transfer to buckets, take outside and allow to evaporate. Wash the spillage area with water and detergent.**

Mercury

- **Instruct others to keep well away from the spillage area.**
- **Good ventilation is paramount.**
- **Deal with the spillage wearing a laboratory coat, gloves and eye protection.**
- **Metallic mercury should be dealt with as follows:**
- **If the spill is small, remove it by suction into a plastic bottle. Treat the affected floor area or bench top with a mixture made by adding equal parts of flowers of sulphur and calcium hydroxide to water to produce a paste, or cover the spill with zinc powder to form an amalgam.**
- **The mixture should be allowed to dry on the contaminate area.**
- **Allow at least 12 hours to elapse before removing the dried mixture with clean water. Repeat to ensure the surfaces are clean.**
- **If the spill is small and the liquid has been absorbed into small cracks in the floor it should be rendered non-volatile at once by coating the area with zinc dust. If possible, monitor the area regularly after treatment to check for mercury vapour.**
- **Mercury compounds – treat the spill by covering it with 10-20 times its own bulk of sand. The mixture can then be scooped up and stored for removal by professional contractors.**

Location of safety equipment

- **Each laboratory contains the following items:**

- **CO₂ FIRE EXTINGUISHERS.**
- **FIRE BLANKET** – to be used for smothering small fires involving cooking fats or other flammable liquids, and also for smothering the flames on people whose clothing has caught fire.
- **BUCKET OF SAND** – to contain spillages of flammable or other heavy liquids, thus preventing the spread of fire.
- **BASIC FIRST AID KIT** – only to be used for minor injuries or until skilled help is available.
- **RESIDUAL CURRENT CIRCUIT BREAKER** – turns off the electricity supply immediately a pre-set current flows from the supply to earth.
- Preparation rooms contain mercury spillage kits and other items needed to deal with the spillage of hazardous substances.
- Main electrical safety testing equipment is held by the Media Resources Officer and the Science Department. Testing of mains operated electrical equipment is carried out by the Science technicians.

Location of CLEAPS Hazcards

These are kept in a labelled folder in the main preparation room, i.e, room F6. These cards are an excellent source of information about most chemicals and should be consulted by teachers who may be unfamiliar with the correct use etc of certain chemicals. Any reference omitted should be reported back to the teacher by the Senior technician.

Control of substances hazardous to health (COSHH)

The control of substances hazardous to health (COSHH) Regulations 1989 is intended to protect employees and others from substances which might be hazardous to health. As far as schools are concerned, this includes micro-organisms and all uses of chemicals classified as harmful, toxic, very toxic, irritant or corrosive. The chemicals might be intermediates in or products of a chemical reaction. Strictly speaking explosive, flammable or radioactive substances and oxidising agents are not covered by the COSHH regulations. The ASE Laboratory Safeguards Sub-committee recommends that teachers treat all chemicals as if they were covered by the COSHH regulations. Under the COSHH Regulations, employers are obliged to carry out a Risk Assessment before hazardous substances are used or made. The Health and Safety Commission has endorsed the use of General Risk Assessments, and has advised the use of publications such as:

ASE (1988) Topics in Safety, 2nd edition, ASE

CLEAPSS (1989) Hazcards, CLEAPSS

HMI (1990) Microbiology. An HMI Guide for school and further education, HMSO

Where an employer has adopted General Risk Assessments, the role of the teacher is to compare their proposed procedure with that defined in the General Risk Assessments.

- Is this activity educationally necessary?
- Is there an alternative less hazardous substance or procedure?
- Is it teacher demonstration, or pupil practical work?
- What is the age and experience of the pupil?
- How will the pupils be warned about hazards?
- What is the scale of working?
- What personal protection or control measures are necessary (eye protection, gloves, fume cupboard, safety screens)?
- How will residues be disposed of at the end, without risk to the technicians?
- For the time being Hazcards will be issued with chemicals when relevant. The department will annotate new schemes of work and teachers/technicians notes to point out hazards, necessary precautions, and any other safety requirements. Existing schemes of work will be amended during the course of the year.

Monitoring of fume cupboards

This is carried out by the Senior Science Technician.