

Bulletin 276 Health & Safety

Chemicals in Early Years settings and Primary schools

The connections between secondary schools and their cluster primary schools are important and of benefit to all. However, recent enquiries to SSERC have highlighted that there are some aspects of Health and Safety, where some extra consideration is called for.

It is not uncommon for secondary schools to help with the provision of equipment or chemicals for use in Early Years and Primary science and technology. In principle, this is not a problem but there are important points to consider. There is also the possibility that a primary teacher is likely to be less familiar with their safe use.

Restrictions in Early Years and Primary settings due to health and safety are not the same as in a secondary school. Regarding chemicals for instance, there are greater restrictions on the type and concentration of chemicals that younger learners can use or be exposed to.

The best guide for Health and Safety in Science and Technology in Early Years and Primary is the Association for Science Education's "Be Safe!" (Fourth Edition).

In general, arrangements work well and safely but we recently heard of a situation where a primary teacher was looking to source some chemicals from a secondary school of a higher concentration than would be safe even in a secondary classroom. This is not a common event but it was only flagged up because the teacher went through the secondary school. Had they managed to source the substance from a supplier there could have been a significant risk.

You should also be aware that, if you are considering delivering materials or equipment to an Early Years or Primary setting, there are legal restrictions on the transportation of hazardous chemicals by road (although the fact that they ought to be of low hazard should mitigate any problems).



Where secondary age learners are leading activities in Early Years or Primary settings, for example as part of the Young STEM Leader Programme, risk assessments must take the above advice into account.

As usual, if there is any doubt, contact SSERC for advice. Specific advice from the Early Years and Primary Team at SSERC can be obtained by emailing primary@sserc.scot.



Other topics

- > Working with radioactive materials - HSE inspections 2
- > Breaking glass 3

Working with radioactive materials - HSE inspections

The Health and Safety Executive’s Field Operations Division has contacted SSERC (and CLEAPSS for the rest of the UK) to explain it is undertaking a programme of inspections across England, Wales and Scotland to see how schools manage the safe use and storage of the radioactive sources used in science teaching.

An inspection programme may come as a surprise to some when you consider the relatively low risk of these sources compared to those used in universities and hospitals. But low risk does not mean exemption from inspection.

Ahead of the inspection programme, our advice for Scottish schools with radioactive materials is to log in to our website and read the document Working With Radioactive Materials in Schools, which is downloadable from our [Ionising Radiation webpage](#).

We are not the radiation protection police at SSERC, nor do we carry out inspections. If we did do so, we’d expect to be introduced to a member of staff who had taken responsibility for ensuring that the science department’s procedures for working with radioactive materials were both safe and compliant with the law. Have a look at the following checklist. Can your school tick all the boxes?

If you can’t at the moment, make sure that you address the weak areas. You are not on your own – the team at SSERC will work with you. Contact us on rpa@sserc.scot.

We also run courses on working with radioactive materials. We’d love to see you at our face-to-face course that will next run in August, but we appreciate that not everyone who wants to will be able to come. We will also run an online course in March 2023 and are soon to launch a self-study course. Details of all courses can be found on our [website](#). Keep checking for new courses!

At the time of writing, we don’t know how many schools in Scotland HSE intends to inspect or when they will be inspecting them. We are however confident that all schools who keep and use radioactive materials should be able to work with SSERC to be in a position where they have nothing to fear from an HSE inspection. <<

This is a checklist

Item	Comments
SSERC poster with basic safety rules displayed, customised to have your own ‘radiation casualty’ hospital listed, and supervisory teacher identified.	Editable version downloadable from our Ionising Radiation webpage .
Stocklist present	Editable version downloadable from our Ionising Radiation webpage .
Log of usage maintained	Editable version downloadable from our Ionising Radiation webpage .
Monthly stock checks take place (except for summer holidays) and are recorded in log	
Only approved sources used	See document <i>Working with Radioactive Materials in Schools</i> for a photo guide.
Contingency plans available	Customisable plans available in document <i>Working with Radioactive Materials in Schools</i> .
Plans covering less serious incidents available	Customisable plans available in document <i>Working with Radioactive Materials in Schools</i> .
Activities risk-assessed, control measures communicated to users	Generic risk assessments available for adaptation from our Ionising Radiation webpage .
All staff who work with radioactive materials given appropriate training	We run training courses, details on our website or inhouse training can be provided by a competent person e.g. the supervisory teacher.
No work with radioactive materials by learners if under 16s in the class	
Training and supervision of older learners if they are to use radioactive materials	
Appropriate secure storage	See document <i>Working with Radioactive Materials in Schools</i> .
Leak testing carried out and recorded	See document <i>Working with Radioactive Materials in Schools</i> and spreadsheet downloadable from our Ionising Radiation webpage .

Breaking glass

The biggest problem with glass from a health and safety point of view is linked to its biggest drawback – the fact that it is brittle and likely to break. But there are a few lesser issues as well.

Cuts

The edge of a piece of broken glass can be phenomenally sharp. It is possible to obtain scalpel blades made from glass what are many times sharper than steel with an edge only 3 nm or so thick!

Clearly then any broken glass should be handled with care. It is usually easy to see when glass is broken and pick or sweep them up carefully with appropriate precautions. Beware of tiny slivers that can sometimes be missed. If it is not easy to sweep these up, you can use a piece of blu-tac to pick them up.

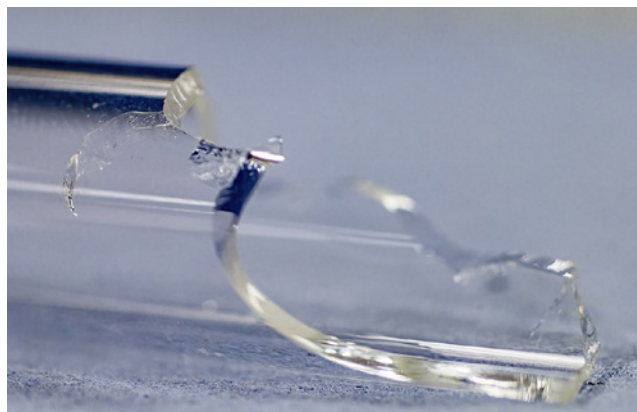
You need to particularly beware of glassware piled in a washing up bowl. It is always wise to check it before filling with water and detergent. Once it is full, you will not be able to tell if there is broken glass there and can easily give yourself a serious cut.

Another potential cause of nasty cuts is inserting glass tubing into bungs or corks. It is important to use the correct technique for this to avoid injury:

- Insert a cork borer, wide enough for the glass tube to fit through, into the hole in the bung. You can use propan-1,2,3-triol (glycerol) as a lubricant for this.
- Insert the glass tube through the cork borer.
- Remove the cork borer, leaving the glass tubing in place.



A shard of glass.



A broken test tube.

Inserting pipettes into fillers can also be a hazard. To avoid breakage and stabbing themselves, learners should be taught to hold the pipette only a centimetre or two from the end and not to push too hard.

Burns

Glass can get extremely hot and looks no different from cold glass. Moreover, it has quite a high specific heat capacity and so will stay hot for a long time. So be very careful before picking up any glass item that has been strongly heated.

Spillage

Another problem with the brittle nature of glass is that if it breaks the contents will spill out, and these could be hazardous. In addition to the normal precautions you would take with any container: watch out for cracks – a crack, even a hairline one, in glass can lead to sudden failure particularly when heated.

Stuck stoppers

Stoppers, particularly in storage bottles, can become stuck in place. This is most common with ground glass stoppers. These should be avoided for bottles containing sodium hydroxide or other alkaline solutions as the alkalis can react with the glass and cement the stopper in place.

Similarly, alkaline solutions should not be left in burettes or pipettes as they will cement the jets closed.

Gentle tapping or warming can sometimes loosen them but even if not then it is usually no more than an annoyance.

Sometimes, however, the chemical inside the bottle can release gases that produce an increase in pressure that can cause the bottle to explode. Silicon tetrachloride is known for this. <<