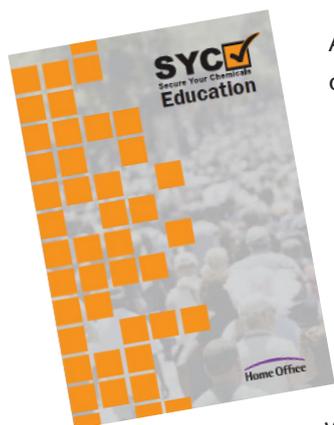


Many of you will now have seen the aforementioned document. It is available for download from the front page of the new SSERC website [1]. Hopefully you should realise that there is no cause for alarm. It is worthwhile, however, running through a summary of the document and its implication for school science departments.



Background

As part of a general tightening up of access to potentially dangerous chemicals, particularly in light of current security concerns, the Home Office approached SSERC and CLEAPSS with a document they had produced for industry with a view to our adapting it for educational use. After a certain amount of to and fro, we managed to come up with the document *Secure Your Chemicals*.

Some of the chemicals listed are of obvious concern in many ways, such as mercury, but a look through the list will suggest that the main worry is fire/explosion so most of the chemicals named are either flammable or oxidising and while many are fairly innocuous on their own, in combination, they can be hazardous.

Actions

Good management practice would dictate that schools should already be doing almost everything that this document suggests but here is a summary :-

1. Chemicals should be kept securely and access limited to authorised personnel only and as small a number as is practicable.
2. A regular audit (stocktake) should be carried out of chemicals in store.
3. Chemicals should only be ordered by authorised personnel and should be recorded and stored safely immediately upon arrival.
4. There are certain chemicals (see list) which are of particular concern and technicians/teachers should keep an eye out to make sure these in particular are secure.
5. If any of the chemicals on the list are noted as having gone missing

- a) Double check that stock really is missing with all staff members.
 - b) Record as much detail as possible about missing stock or a suspicious incident. Include names, times, dates and list the name and quantities of the chemicals missing.
 - c) Contact your local police if you find any of the chemicals listed unaccounted for.
 - d) If you think that the loss may be related to terrorism contact the Anti-Terrorist Hotline on 0800 789321.
6. If teachers/technicians are approached by people trying to purchase any of the chemicals on the list, this information should also be passed on to police.

Chemicals causing most concern

Some of these could legitimately appear in more than one category (e.g. nitric acid is an oxidising agent as well as an acid) but it makes sense that they do not appear more than once :-

Solvents

- propanone (acetone), CH_3COCH_3
- alcohol (ethanol, methanol; solutions greater than 50%), $\text{C}_2\text{H}_5\text{OH}$ or CH_3OH
- nitrobenzene, $\text{C}_6\text{H}_5\text{NO}_2$
- nitromethane, CH_3NO_2
- ethane-1,2-diol (ethylene glycol), $\text{HOCH}_2\text{CH}_2\text{OH}$
- propane-1,2,3-triol (glycerine/glycerol), $\text{C}_3\text{H}_8\text{O}_3/\text{CH}_2\text{OHCH}(\text{OH})\text{CH}_2\text{OH}$
- butan-2-one (methyl ethyl ketone), $\text{CH}_3\text{COCH}_2\text{CH}_3$



Acids

- concentrated (glacial) ethanoic acid (acetic acid), CH_3COOH
- citric acid, $\text{C}_6\text{H}_8\text{O}_7$
- concentrated hydrochloric acid, HCl
- concentrated sulphuric(VI) acid, H_2SO_4
- concentrated nitric(V) acid, HNO_3



Oxidising Agents

- ammonium nitrate(V), NH_4NO_3
- any chlorate(V/VII) (Perchlorate), NaClO_3 / KClO_3 or NaClO_4 / KClO_4 / NH_4ClO_4
- any nitrate, KNO_3 / NaNO_3
- hydrogen peroxide, H_2O_2
- lead nitrate(V), $\text{Pb}(\text{NO}_3)_2$
- calcium chlorate(I) (calcium hypochlorite), $\text{Ca}(\text{OCl})_2$
- solid potassium manganate(VII) (permanganate), KMnO_4



Others

- hexamine/hexamethylene tetramine, $C_6H_{12}N_4$
- mercury, Hg
- 2,2-bis(hydroxymethyl)1, 3-propanediol (pentaerythritol), $C(CH_2OH)_4$
- powdered metals (aluminium (Al), magnesium (Mg), magnalium (Al/Mg), zinc (Zn))
- sodium azide, NaN_3
- sulphur, S
- urea, $CO(NH_2)_2$

This list should not be considered as exhaustive. If you have other chemicals you think are similarly hazardous (perhaps acquired for an AH project) and they go missing, you should still follow the procedures above. If you have any doubt as to the threat posed by a chemical, check out the Hazardous Chemicals section [2] of the SSERC website and if that does not give you the information you need, contact us here at SSERC.

References

- [1] - http://www.science3-18.org/sserc/images/legacy/Hazardous_Chemicals/SYC_Education_Final.pdf
 [2] - http://www.science3-18.org/sserc/index.php?option=com_content&view=article&id=1083&Itemid=11



Safety in numbers

The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) legislation [1] places a duty on employers to report deaths, major injuries, three day injuries to employees (injuries that result in three or more days off work) and injuries that result in members of the public being taken to hospital.

In a state school setting, the employer is the local authority, teachers and support staff are employees and pupils are members of the public. Reports are made to the Health and Safety Executive.

The HSE has sent us the Scottish education sector RIDDOR data for session 2009 / 2010. In that period, there was one fatality, when an electrician was killed by a high fall. Around 350 employees were injured, with numbers in primary and secondary schools roughly equal. Approximately a quarter of those hurt were teachers or technicians. The number of reports where the subject was a member of the public was 632, the vast majority being pupils, with almost twice as many secondary as primary children injured. On average, each Scottish secondary school had one RIDDOR incident involving a pupil in this year-long period.

The figures break down the accidents by type. We were particularly interested in those that came under the heading of "contact with harmful substance", though we have no way of knowing if they happened in science or technology classes. Only 2% of pupil accidents and 3% of employee accidents fell into this category. The most common causes of injuries were slips and trips, accounting for 40% of the total.

Remember that we are not talking about trivial "skint ma knee" injuries here. Overall, the HSE data reinforces the view that schools are largely safe places in which to work and learn. This is not complacency. Indeed, schools are safe because employers and employees are, by and large, not complacent about safety, particularly when the risk is potentially high if not carefully controlled. As ever, there are areas where we can improve, particularly with respect to slips and trips. The HSE's website [2] has very useful information, including guidance, advice and case studies.

References

- [1] <http://www.hse.gov.uk/riddor/riddor.htm>
 [2] <http://www.hse.gov.uk/slips/index.htm>