NZASE resource

in science teach **airei**ty

We have a new safety guidance document for the use of hazardous substances in schools. As the liability is now on teachers' shoulders we need to make sure we are fully aware of our responsibilities.

Safety and Science/Pūtaiao: Guidance for Aotearoa New Zealand schools and kura was published by the MoE in November 2021, after five years of work by NZASE, the Science Technicians Association of NZ (STANZ), WorkSafe, and the Ministry to better meet the requirements of recent health and safety legislation.

This document replaces the three documents teachers had been working under:

- Safety and science: A guidance manual for *New Zealand schools* (MoE, 2000)
- Code of practice for school exempt laboratories

(Environmental Risk Management Authority, 2007)

• Guidance to the code of practice for school

exempt laboratories (MoE, 2016).

In term 2 this year NZASE will run a series of webinars on the 2021 regulations, each targeted at a different group – lab managers, technicians, teachers, and principals.

Practicals are the cornerstone to teaching science – they engage students and make science real. However, a practical programme is not without risks, and in today's healthand-safety-conscious environment we need to mitigate these risks to ensure students and staff stay safe.

Sarah Hay, a member of the NZASE executive, was involved developing the 2021 document. She says, "In the past, Boards of

lew Zealand Association of Science Educators

ENTRY FOR AUTHORISED PERSONS ONLY

Trustees (BoT) assumed responsibility for compliance. With Safety and Science, liability for non-compliance shifts to teachers and no insurance is available. If there is an accident, WorkSafe will investigate, including talking to the students."

"Teachers are unlikely to be prosecuted as long as they have done a risk assessment and given students appropriate safety instructions. If a student did not follow the rules, that is not on the teacher. But if found negligent, a teacher could face imprisonment or a fine of up to \$600,000."

BoTs also have a role; they are responsible to ensure appropriate policy and procedures; that buildings and facilities are safe; that signage is at the entrance to laboratories; that staff have the right information and training

> (including cleaners and relievers); that technicians have the PPE they need; and that a person with the requisite chemical

A monolingual sign for a laboratory door.

Common

symbols in

school labs: from left -

oxidising,

corrosive,

health

flammable,

hazard, and ecotoxin.

hazard

knowledge is designated as lab manager.

"However, Safety and Science (2021) does not say anything about class size. If teachers have issues with numbers of students in a lab, then they should look to PPTA for support," says Sarah.

A lab manager (LM) is responsible for the handling, use and storage of hazardous substances in the lab. This includes ensuring that: the school has an inventory and emergency response plan; teachers have the information and training they need; and the LM has approved any activities with hazardous substances.

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From left Pbl₂, CuSO₄, PbO. CuCO₃, and CrCl₃. Each of these substances have some safety concerns.



Safety in secondary school labs

A laboratory is a room where science is taught and where hazardous substances are used or stored - this includes reticulated gas for Bunsen burners. So these guidelines do not

apply to art, technology or horticulture rooms.

A main focus of the 2021 guide is hazardous substances, i.e. those which are explosive, flammable, able

to oxidise, corrosive or toxic, or which produce such substances on contact with water.

The key to health and safety for science teachers is evaluating the risk of their practicals and ensuring that students know the hazards and safe practice for them. This not only incorporates the science involved but

also the students in the class. Do you have students who use inhalers; who have poor vision; hearing or literacy; or students with long hair or scarves? What precautions will you put in place for them?

Sarah says, "teachers know the students in front of you and the layout of the room," and need to tailor risk assessment appropriately. This means that your documentation needs to be reviewed,

and amended if needed, every time you plan to use that practical. This is clearly the responsibility of the classroom teacher, not the science technician or lab manager. "Risk



fety Controls

Wear PPE to protect eyes, face and ski including: safety glasses with side shie cold-insulating gloves, closed shoes.

d container with lo container periodical

sed dry ice may be allowed to sut in a well-ventilated area.

nt waste from contar

rk in a well-ventilated area Use tongs to handle pieces of dry ice re in insulated cor ng lid; vent conta bid build-up of gas

May be stored in a running fume

Dry ice (solid carbon dioxide, CO₂)

nt Hazard

Sublimation temperature is contact with skin may resul

late in low, conf

Assess at \$300 annually is very useful and cost effective," says Sarah.

A Safe Method of Use (SMU) provides information about how to safely use the hazardous substance. It must describe the hazard, safety controls, emergency

> procedures and disposal. It must be read before the practical and be available if needed during the practical. Science teachers must be present for every stage of the

experiment, and take an active role in safety. This includes taking measures to ensure appropriate student conduct, such as wearing PPE, following rules and safety with shoes, hair, head coverings, jewellery, and food and drink in the lab.

All science staff will need health and

safety training specific to science. And in successive years, new staff induction will need to include this training as well.

Signs, such as 'Entry for authorised persons only' on the lab door, should be bilingual. And labelling, safety data sheets and packaging must have the correct (GHS 7) classification by 2025.

Classroom teachers, technicians and lab managers must all ensure that

hazardous substances are stored safely and disposed of properly.

The guide says that fume hoods should be ducted to the outdoors. Portable fume hoods (correctly called fume cabinets) have legal



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Safe Method of Use (SMU) labels for dry ice.

Container

labels are

required.

requirements for additional testing, logging and maintenance. In particular, fume hood certifiers need qualifications to test to the specifications of standard AS/NS2243.9; many currently do not.

Teachers using a fume cabinet need training to be aware of its limitations (the quantity and type of solvents allowed) and siting requirements (you can't just put it anywhere).

Safety in primary schools

As primary schools tend not to use hazardous substances they are usually very safe. But a safety conscious approach is wise – identify

hazards, assess and control risks. It is important to teach students how to use substances and equipment safely and avoid or manage risks.

Teachers should get students in the habit of washing their hands after practical work, and keeping food and drink out of spaces where hazardous substances are used or stored. Be aware that copper sulphate, with its striking blue crystals, is poisonous and student access should be

limited and only with safety glasses, as this compound can seriously damage eyes. Page 119 of <u>Safety and Science 2021</u> lists substances that are safe to use in years 1 to 8.

Ngā Kupu

 Ārai haumaru</u> – Safety protection

 Haumaru – Safe, safety

 Kaimahi – Staff

 Para mōrearea – Hazardous waste

 Pūmatū – Chemical substance

 Taiwhanga pūtaiao – Science laboratory

 Taiwhanga kaiwhakahaere –

 Laboratory manager

 Taiwhanga kaimahi – Lab technician

 Tapanga – Label

 Tūhuratanga ā-ringa – Practical

 investigation.



Left: A school fume cabinet. Below: Example of a Globally Harmonised System (GHS) label for ammonia.



This article was improved by critique from Arwen Heyworth.

This article summarises some key features of the document. Reading this article does not take the place of reading <u>Safety and</u> <u>Science</u>, 2021. <u>Sarah Hay</u> is happy to respond to

queries about the safety document.



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