# Radioactive substances used for science activities

Some schools may have radioactive sources on site that are used, or have been used in the past to support the science curriculum. To support the safe and compliant use of radioactive substances, the Queensland Health Radiation Safety Unit advises that schools:

- with radioactive material are to follow the national Safety Guide for Use of Radiation in Schools Part 1: Ionizing Radiation (Radiation Safety Guide; RPS18), published by ARPANSA. Note the department also requires that best practice guidance for lasers and radiation emitters in this guide is also to be adhered to.
- must now contact the Queensland Health Radiation Safety Unit (RSU) **for disposal** of any radiation source (including geological materials) regardless of whether it may be deemed an 'exempt' source in the guide:
    - contact may be made using the 'Radioactive materials questionnaire' form at the end of this factsheet, or by completing the online form.
    - contact is required because Queensland legislation has its own disposal criteria based on concentration of the radionuclide, and most sources exceed that disposal criteria.
    - the preferred option is for RSU to collect, or have the school courier the sources to them for disposal or long-term storage.
- are encouraged to contact RSU to seek advice **before purchasing** sources as a licence to possess may be required. Selection of sealed sources is preferred in order to reduce the likelihood of contamination.

## Are there alternatives to using radioactive sources?

Schools wanting to demonstrate the concept of radioactivity, without storing a radioactive source at school can use a completely safe simulator which is available from science supply companies for approximately $200. Free simulators are also available online.

Schools may also consider using naturally-occurring radionuclides found in potassium-rich foods. Bananas, brazil nuts and lima beans are rich in potassium minerals and are well suited as an alternate source. The amount of natural radiation present is very small yet measurable and does not pose a radiation risk.

## What should schools do to ensure the safe use of radioactive sources?

1. Check if your school has radioactive sources on site. Check entries in science equipment and chemical registers, contents of the school safe/s, storage areas in science laboratories and other store rooms for containers with any of the following labeling:
    a. 'radioactive', 'science department'
    b. the name or symbol of an isotope and its mass number e.g. 'Strontium 90', 'Sr90', 'Cobalt 60', 'Co60', 'Caesium 137', 'Cs137', 'Polonium 210', 'Po210', 'Radium 226', 'Ra226', 'Americium 241', 'Am241'.
    c. 'For use with a Geiger counter' e.g. →
    d. 'danger' or 

e. the source itself may be wrapped in lead inside the box.

2. Determine if your school needs to keep the radioactive sources. Verify how often and how recently any sources have been used:
    a. ask science teachers and technicians, check experiment requests or equipment logs;
    b. determine how often the product is accessed: there will be a limited number of people who can open the safe so you can check if, and when, the radioactive source has been retrieved;
    c. check associated equipment: check the science asset register, or with the science department regarding any records of a Geiger counter or other radiation detectors. If there is no record of access to sources or detectors, it is unlikely that any sources or equipment are used.

3. **If** it has been determined through consultation with the principal and science department representatives that the product is to be kept:
    a. **contact Radiation Health using the questionnaire or online form** to obtain advice on how to safely manage, store and dispose of your materials, and how to access any training requirements you may identify.
    b. appoint a suitable **Radiation Supervisor** (see Safety Guide s4);
    c. complete a risk assessment for each activity involving work with ionizing radiation;
    d. develop and follow rules for the safe use of all curriculum radiation sources; and
    e. keep and maintain appropriate records as per the Safety Guide.

## Who can use radioactive sources at School?

Only appropriately qualified or trained staff are to handle radiation sources.

- Teachers appointed to permanent positions on the science staff would be reasonably expected to have the qualifications required to handle radiation risks and have a sound understanding of associated hazards and safe handling requirements
- Pre service teachers, temporary staff, or those for whom science is a secondary subject, may not be suitably qualified. These staff are to be supervised by a qualified teacher until the Radiation Supervisor considers that they have gained adequate knowledge and experience.
- Science Technicians have a range of qualifications and experience. The Radiation Supervisor is to decide what functions (if any) they can be reasonably be given. Training/skill development is to be commensurate with the tasks allocated.

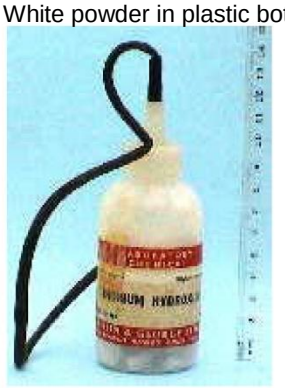
As per the Radiation Safety Guide, the handling of radiation sources by students is restricted:
- Students in years 11 and 12 may use sealed radioactive sources in supervised practical work.
- Radioactive sources are to be used for demonstrations only for students in year 10 and below.

**Radioactive material may look like one of these**:

Clear or coloured disc (Co60, Sr90, Am241, Cs137, etc)


Clear block with metal strip (Ra226)


White powder in plastic bottle



Geological samples (Uranium or Thorium ores)

**It may be packaged like this**:

Thin matchbox-type container

Lead foil


Small cardboard box

**The radioactive material or package may have a label like this**:


Further Information
[Radiation Safety Regulation 2021](#) (Qld).

# Radioactive material questionnaire

Please complete the questionnaire and email back to Radiation Health (RHadvice@health.qld.gov.au).

| | |
|---|---|
| Name of school: | Location code: |
| Street address: | |
| Contact person: | Phone no: |

Is your school in possession of any radioactive material? ☐ Yes ☐ No

If 'yes' please provide details below. Include any geological samples that you know to be radioactive.

An officer of Radiation Health will contact you to discuss options for keeping or disposing of your radioactive material.

| Radioactive material | Activity on label (if any) | Physical condition |
|---|---|---|
| | | |
| | | |
| | | |

Do you wish to dispose of any radioactive material in your possession? ☐ Yes ☐ No

Do you wish to keep your radioactive material and use it for teaching? ☐ Yes ☐ No

| |
|---|
| Comments: |

Signature (Principal/Officer in Charge) Date

**Postal**
Radiation Health Unit
PO Box 2368
FORTITUDE VALLEY
BC QLD 4006

**Email**
RH.advice@health.qld.gov.au

**Contact**
Phone: 33289310