



# ASSIST

AUSTRALIAN SCHOOL SCIENCE  
INFORMATION SUPPORT FOR  
TEACHERS AND TECHNICIANS

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## Radioactive Minerals

Posted by Anonymous on Thu, 2018-10-25 14:52

Radioactive Minerals: Our school recently found a cardboard box of radioactive minerals which have been stored at the back of the cupboard. Do these minerals need to be stored in a metal container or glass jar like our radioactive samples or is the original box still okay? Will these samples also produce Radon gas? One of the minerals from what I can see is Uraninite.

### Voting:



No votes yet

### Laboratory Technicians:

Laboratory Technicians

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## Radioactive Minerals

Submitted by sat on 25 October 2018

All known sources of radioactive materials for use in school science should be stored in a manner that protects staff, students and visitors from harmful effects.

Unsealed sources of radiation such as in rocks, minerals and ores, present more hazards than sealed radioactive sources. There is a much higher risk to human health due to possible exposure through the skin, ingestion or inhalation. If you do have uranium ores, be aware that uranium compounds emit alpha particles and so the **generation of dust must be avoided**<sup>1</sup>. Uraninite is not suitable for use in the classroom,<sup>2</sup> so you may need to seek professional help

in identification and disposal.

We recommend that all schools check their geological samples using a Geiger counter to see if they unknowingly have any radioactive rocks. It is not uncommon for schools to receive donations that contain radioactive rocks. (If you are checking your rocks, if you haven't already done so, we strongly recommend that you ensure that there are not any samples of asbestos in your rock collections.)

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) is the Australian Government's primary authority on radiation protection and nuclear safety. ARPANSA works with state and territory regulators to promote national uniformity of radiation protection.

- For school specific guidance on best practice see the ARPANSA Safety Guide for the Use of Radiation in Schools (2012) see <https://www.arpansa.gov.au/sites/default/files/legacy/pubs/rps/rps18.pdf> . Science ASSIST recommends that schools be familiar with this document and a printed copy of this resource is available for reference.
- For details of your state/territory regulator see <https://www.arpansa.gov.au/regulation-and-licensing/regulation/state-territory-regulators> (Link updated June 2019)

The ARPANSA document states that radioactive rocks may be used in schools and that “*Such rocks are best kept in a box with a clear lid so that their radioactive properties may be demonstrated without the need to handle them.*”<sup>3</sup> You should seek advice from your school jurisdiction or governing body to see if radioactive rocks are permitted and you should also seek advice from your state regulator, regarding any state requirements or restrictions concerning the level of radiation emitted and for guidance for suitable disposal.

We have provided some information on our website that may be helpful. See

- SOP: Handling sealed radioactive sources in particular see p 5 for supplementary information regarding the storage of radioactive sources
- Q&A: Radioisotopes in particular note that “School Geiger counters tend to measure relative activity and need to be calibrated to accurately measure the actual activity levels.”<sup>4</sup>

**If your school is permitted to and chooses to keep radioactive rocks, control measures should be implemented to minimise exposure:**

- Store as recommended (see information in the ARPANSA Safety Guide for the Use of Radiation in Schools (2012) and the SOP: Handling sealed radioactive sources)
- Only keep small samples
- Keep them in a sealed plastic bag or sealed clear container.
- Do not touch the rocks or ores with your hands.
- Use disposable gloves if they need to be handled, keep the time to a minimum and avoid the generation of dust.
- Wash your hands after handling.

Regarding the production of radon gas, the ARPANSA website has information on this, see <https://www.arpansa.gov.au/understanding-radiation/radiation-sources/more-radiation-sources/radon>

. We draw your attention to a couple of points on this page:

- "Radon is present in all air.
- Radon is a naturally occurring radioactive gas, which has no smell, colour or taste. It comes from the radioactive decay of radium, which is present in small amounts in rocks and soil. Radon is chemically inert, so it can easily escape from the ground into the air where it can be inhaled.
- ARPANSA recommends the following reference levels:
  - 200 Bq m<sup>-3</sup> for households
  - 1000 Bq m<sup>-3</sup> for workplaces.
  - Should the radon level exceed the above levels, the appropriate state, territory or Commonwealth radiation health authority should be contacted for advice. For those homes and workplaces that exceed this reference level, there are some simple measures that can be taken to bring radon levels down, such as increasing ventilation."<sup>5</sup>

CLEAPSS has some information that they have made freely available. Note these documents refer to UK and not Australian legislation. see

- <http://science.cleapss.org.uk/Resource/L093-Managing-Ionising-Radiations-and-Radioactive-Substances-in-Schools-and-Colleges.pdf> (2018)
- <http://science.cleapss.org.uk/Resource/SSS011-Radioactive-materials.pdf> (2018)

## References and further reading

<sup>1</sup> CLEAPSS. 2016. Hazcards. *105 Risk Assessment guidance - Uranium compounds*

<sup>2</sup> 'Uraninite'. Geology.com website. <https://geology.com/minerals/uraninite.shtml> (Accessed October 2018)

<sup>3</sup> ARPANSA. 2012. *Safety Guide for the Use of Radiation in Schools (2012)*  
<http://www.arpansa.gov.au/pubs/rps/RPS18.pdf> © Commonwealth of Australia as represented by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) [2012].

<sup>4</sup> Science ASSIST. 2017. *Radioisotopes*, Science ASSIST website,  
<https://assist.asta.edu.au/question/2779/radioisotopes>

<sup>5</sup> 'Radon exposure and health'. 2016. ARPANSA website.  
<https://www.arpansa.gov.au/understanding-radiation/radiation-sources/more-radiation-sources/radon> © Commonwealth of Australia as represented by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) [2016].(Accessed October 2018)

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Science ASSIST. 2015. *ASSIST Information Sheet: Asbestos minerals in schools*. Science ASSIST website. <https://assist.asta.edu.au/resource/3354/ais-asbestos-minerals-schools>

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