



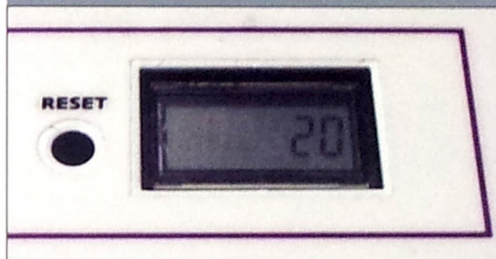
SEP Geiger counter

The SEP Geiger counter has been designed to provide a simple, low-cost instrument for measuring radioactivity. It is at least half the cost of comparable instruments used in schools. It is also portable, containing a Geiger-Müller tube, a digital counter, a loudspeaker and its own integral power supply (a PP3 9V battery) all within a single case. This means that it can easily be carried around the lab or taken outside for fieldwork.

Getting started

Remove the battery holder from the rear of the Geiger counter, and insert a PP3 9V battery into the holder. Note that it will only fit one way round. Replace the holder.

There are only two switches - 'on/off' and 'reset'. Switch the Geiger counter on, and after a warm up period of approximately 20 seconds, it will start detecting incidences of background radiation. An audible 'click' will be heard every time radiation is detected inside the tube, and the digital counter will increase by one. To reset the display back to zero, simply press the reset button.



Using the Geiger counter

The Geiger counter can be used immediately to take readings of background radiation. A reading of between 10 and 30 counts per minute would be typical, though this depends on its location. For example it depends on the geology of the local area and whether it is inside a building or outside. However, because of the random nature of radioactive decay, the count taken in one minute may be different from the count taken in another minute, even in the same location. Thus to obtain a more precise value of the background radiation count, it is better to time the counter over a longer interval (for example, 10 minutes) and then calculate an average.

The SEP Geiger counter can detect the radiation from alpha, beta and gamma sources that are placed directly in front of the small window at the end of the instrument. Thus it can be used to demonstrate the basic properties of radiation at KS4, and can also be used to carry out more advanced quantitative experiments in post-16 science courses.



In particular, it can be used to demonstrate how the radiation from alpha, beta and gamma sources is absorbed to different extents by different shields of paper, aluminium and lead. For more information, you should consult a practical manual that gives details on how to carry out these experiments and the safety precautions to observe. See the *References* section for useful information on teaching about radioactivity and guidance on safety.

References

Sang D (2000) 'Radioactivity' in Sang D (ed.) 'Teaching Secondary Physics' (John Murray), pp224-253. A very useful introduction to teaching about radioactivity and how to carry out relevant practical activities.

CLEAPSS (February 2001) The measurement of radioactivity (R92). This gives information on the different kinds of equipment and specifications of what is available.

CLEAPSS (August 2001) Managing ionising radiation and radioactive substances (L93). This gives information on the handling of equipment and resources and provides model risk assessments.

Further information

You can order the SEP Geiger Counter from Mindsets (UK) Ltd.

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