

ROCKYRAD: AN EDUCATIONAL TOOL FOR THE OF ROCK RADIOACTIVITY

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Abstract

RockyRad is a compact, and portable educational tool designed to facilitate practical measurement and inquiry-based learning of natural radioactivity in rocks. As an evolution of the traditional Geiger counter, the system includes a detector unit and a kit of rock samples selected with different levels of natural radioactivity. It enables students to compare the radiation levels of igneous and sedimentary rocks, assess the effectiveness of shielding materials, or conduct long-term background radiation measurements.

The dedicated Android application extends the platform's functionality, enabling data exportation for analysis and the sharing of results to support collaborative and citizen science initiatives. This integrated digital environment allows students to rigorously evaluate experimental reliability, precisely calculate uncertainties, and empirically demonstrate their dependence on measurement duration, thus bridging practical observations with underlying theoretical principles. Furthermore, the concurrent display of data as both Counts Per Minute (CPM) and equivalent dose rate (nSv/h) clarifies the understanding of absorbed dose concepts. Teachers can utilize the platform to design curriculum-aligned experiments that foster an interdisciplinary integration of physics, Earth science, and statistics. In the context of contemporary energy discussions, RockyRad promotes scientific inquiry and critical awareness by grounding students' understanding of environmental radiation.