

## **A Low-Cost Experimental Approach for Teaching Energy Quantization: Determining the Planck Constant with Arduino and Led**

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**Abstract :** This article aims to present an experimental method to determine Planck's constant by calculating the cutting potential  $V_0$  from LEDs with different wavelengths. The experiment is designed using Arduino as a central tool in order to make the experimental activity more engaging and attractive for students with the use of digital technologies. From the characteristic curves of each LED, graphical analysis was used to obtain the cutting potential, and knowing the corresponding wavelength, it was possible to calculate Planck's constant. This constant was also obtained from the linear adjustment of the cutting potential graph by the frequency of each LED. Given the relevance of Planck's constant in physics, it is believed that this experiment can offer teachers the opportunity to approach concepts from modern physics, such as the quantization of energy, in a more accessible and applied way in the classroom. This will not only enrich students' understanding of the fundamental nature of matter but also encourage deeper engagement with the principles of quantum physics.

**Keywords :** physics teaching, educational technology, modern physics, Planck constant, Arduino

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