FROM TEACHERS FOR TEACHERS

TECHNOLOGIES IN STEM EDUCATION

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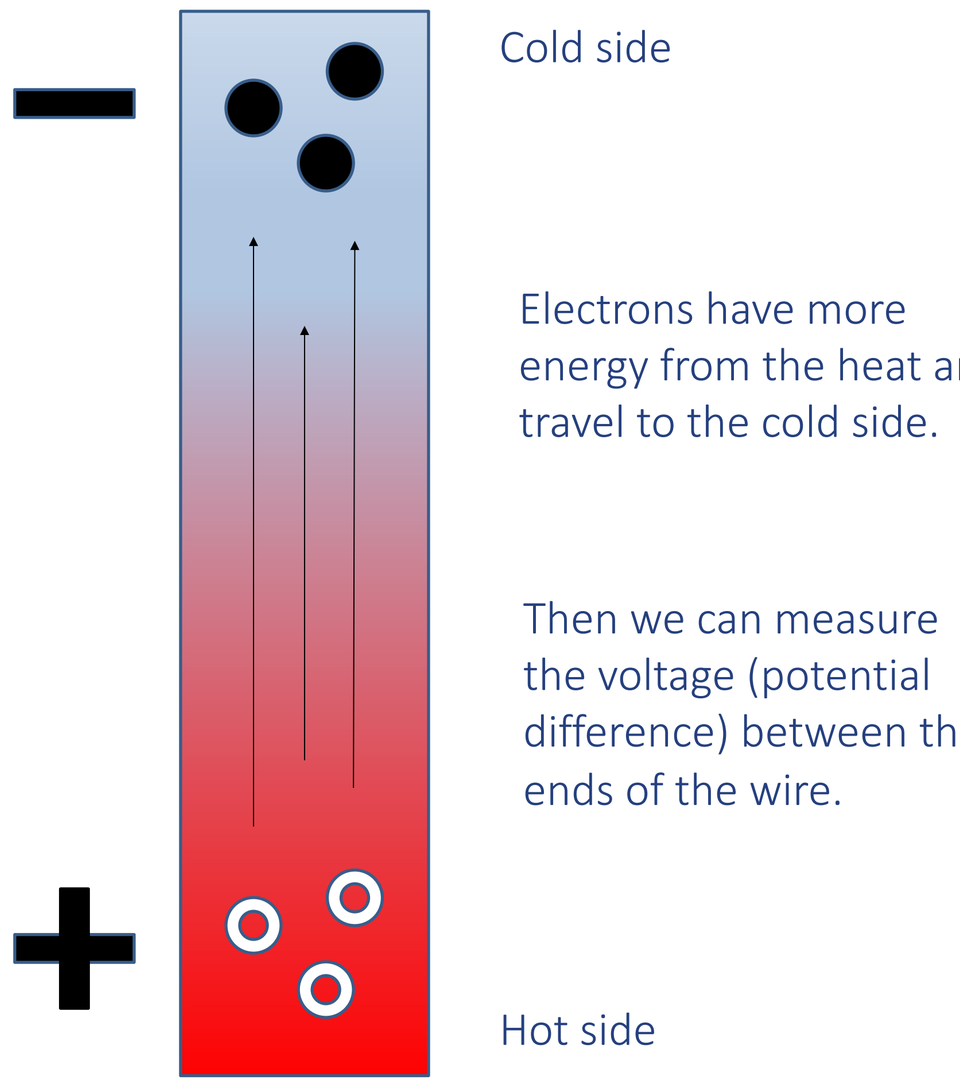
Thermoelectric generator

The aim of the project was to design a thermoelectric generator and demonstrate the thermoelectric effect.

A thermoelectric generator is a device that allows the direct conversion of thermal energy into electrical energy. The thermoelectric generator is a reliable source of electrical energy without the use of any moving parts, thanks to which the whole device is almost inaudible, it does not require any special maintenance and it can theoretically work continuously for a long time. The thermoelectric generator is usually part of space probes, where it supplies stable electricity for decades. These generators use a radioactive element as a heat source, so they are called “RTG” (Radioisotope Thermoelectric Generator).



The principle is the same in semiconductors. Negatively charged electrons travel in N-type semiconductors, and positively charged holes travel in P-type semiconductors. As a result, semiconductor thermocouples can be connected in series.

My generator consist of ten Peltier TEG modules. The heat source is provided by tea candles and the cooling is provided by ice. With this setup, the generator is able to produce up to 2 Watts of electrical power. Peltier modules are connected to a USB module, through which we can charge any mobile device.

“Teachers who make physics boring are criminals.” – Walter Lewin

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