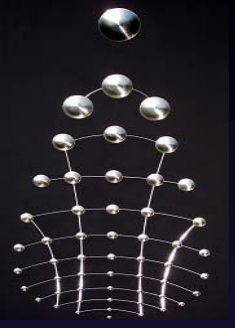
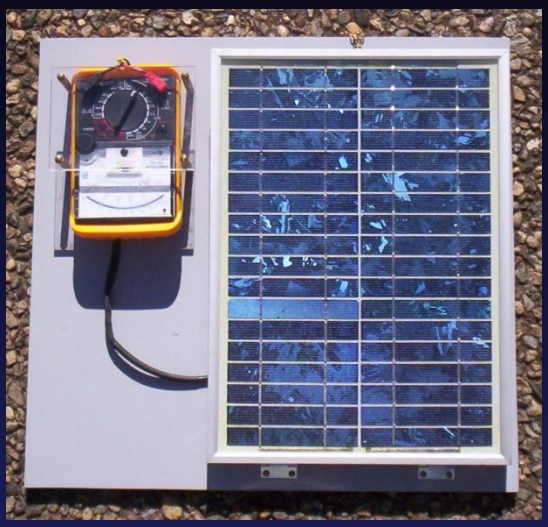


Poly-crystalline Solar Cells

What to do

1. Change the angle of the solar panel in relation to the light
2. Observe the current output and compare with the other types of solar cells



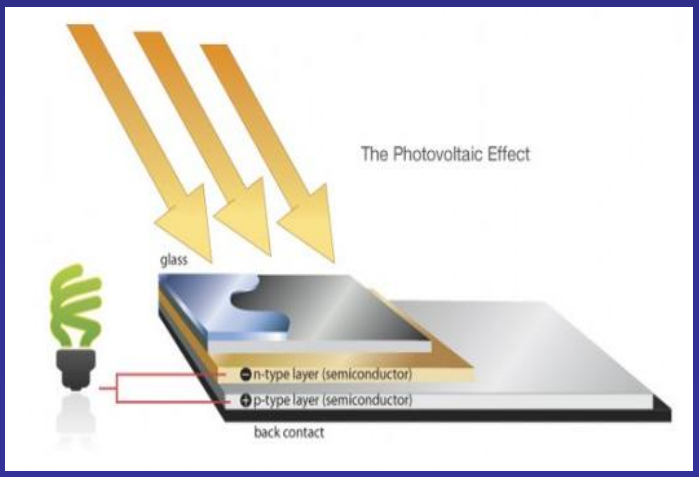
Poly-crystalline Silicon

Poly-crystalline solar cells are composed from many different silicon crystals, and are the most common type of solar cells produced.

Large vats of molten silicon are carefully cooled, forming a block of silicon crystals which can be cut into thin slices for use in the solar panels. Solar panels made this way will appear to have a shiny metallic flake pattern, as the silicon crystals are facing different directions. Other elements such as boron or phosphorus are mixed with the molten silicon to give it different properties.

Poly-crystalline cells are cheaper to manufacture than mono-crystalline cells (made from a single large crystal) however are less efficient as the flow of electrons is disrupted by the change of direction between each new silicon crystal.

Ingots of raw poly-crystalline silicon



How does the solar cell work?

Solar cells transform light energy into electrical energy. Each cell is made up from two layers of silicon. The top layer is doped with an element with easily freed electrons (‘n-type’) such as phosphorus and the bottom layer is doped with an element which has free places for electrons (‘p-type’) such as boron. Where the two layers meet is a ‘depletion zone’ where the free electrons on one side have filled the available places in the other – no more electrons can pass from the n-type to the p-type through this barrier.

When light hits the top electron-rich layer the photons free electrons, however they cannot pass through the junction to reach the spaces available for them on the other side so instead they travel through a wire which connects the two sides. This creates a flow of electrons in the wire – electricity! This phenomenon is called the photovoltaic effect and the electricity which is produced can be used directly or stored in a battery.

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