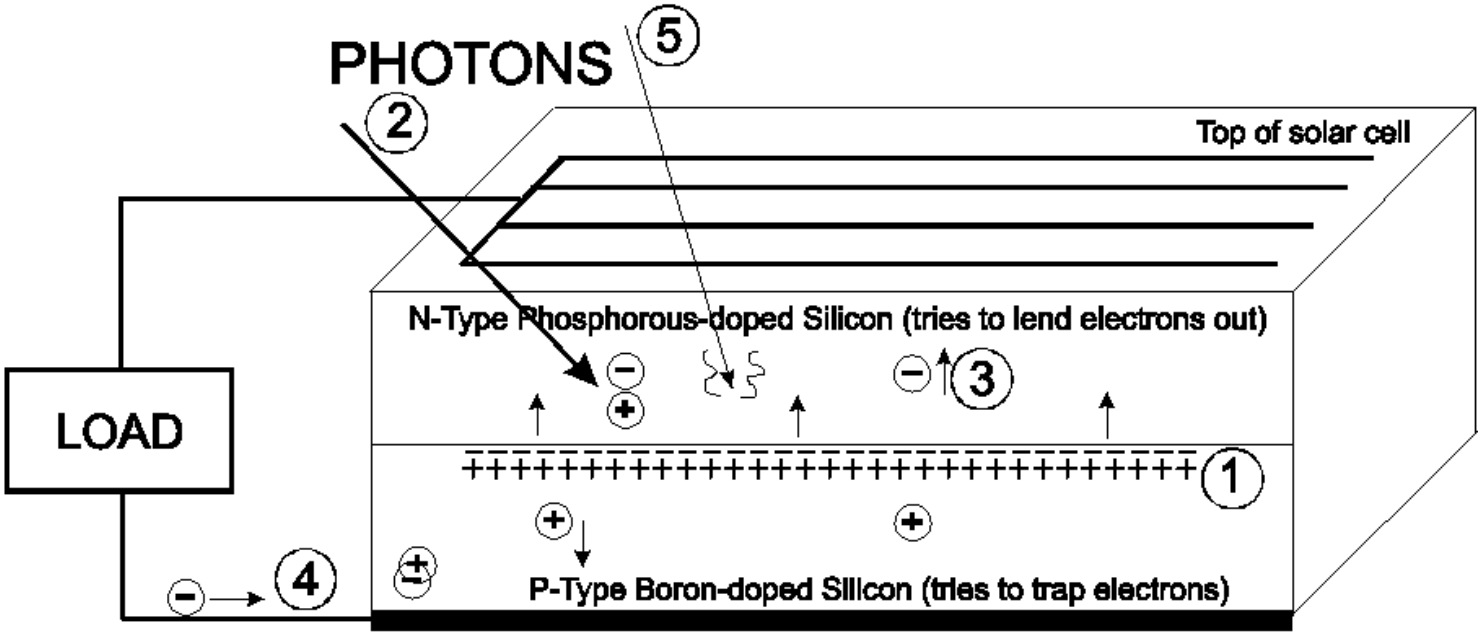
How A Solar Cell Works



1) The N-type lends electrons to the P-type, and the P-type material takes on a net negative electrical charge. This creates a repelling force that pushes any free electrons upwards and free holes downwards.

2) Photons strike Silicon atoms freeing one of their outer electrons creating a free electron and free hole pair.

3) The negative charge on the P-type side pushes the electrons out of the N-type material, and into the metal grid on the top. The positive charges, or holes, are pushed into the P-type material.

4) The charges flow out of the metal grid, through the load, and return to the P-type material, where the electrons rebind with holes vacated by the photon strikes.

5) Only photons with an energy of 1.1 eV or greater can free an electron from silicon. 2.1 eV frees one electron, but 2.2 eV can free two electrons. So only a small band gap of light color (frequency) can actually create electricity from a solar cell. This leads to the 25% maximum possible efficiency level attainable. Photons without enough energy simply dump their energy as heat.