

# What Are Solar Panels Actually Collecting?

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The purpose of my project was to determine if solar panels are functioning (or being designed to function) at their highest possible effectiveness. I asked “Can they produce more power if designed differently?” I decided to look at the different frequencies of light to determine this. I hypothesized that “If I change the frequency of light being shone on a solar panel, then the radiation measured by the cells will vary with the frequency present and the frequency of yellow light will have the most/highest radiation.” To test this I designed a “light tunnel” which had three solar cells at one end. I placed various filters (red, orange, yellow, green, blue, UV, and clear) over the sole opening of the tunnel. I then recorded the amount of photovoltaic energy (in both series and parallel circuit) produced when each filter was applied. The frequency of light present did affect the energy production. The order of the filters from highest production to lowest production was unfiltered, clear, UV, yellow, orange, red, blue, green; which leads me to question my tests. According to my research, the green frequency should have produced a higher amount of energy. Perhaps this was because of a lurking variable, the darkness/shade of filters. Nonetheless, my results showed that we are not maximizing our solar production and that generic solar cells collect only visible light, a minute section on the electromagnetic spectrum. By collecting infrared and/or ultraviolet light in addition to visible light we would increase energy production drastically.