



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Christina Zhu	Project Number S0715
Project Title The Effect of Wavelength of Visible Light on Photovoltaic Cell Electricity Generation	
Objectives/Goals What is the effect of wavelength of visible light on photovoltaic cell electricity generation? The objective is to develop a more efficient method of using light for solar energy.	
Abstract	
Methods/Materials 1 polycrystalline photovoltaic cell 3 flashlights Various cellophane filters (red, yellow-orange, green, blue, and violet) 1 multimeter 2 probe sets 2 alligator clip wires 6 AA batteries The structure for the shining of light onto the photovoltaic cell was constructed with 2 ringstands with wire strung between them, and the flashlights were clipped onto the wire with binder clips. The photovoltaic cell was placed directly under the light of the 3 flashlights. For each sample, the probe sets and alligator clip wires connected the photovoltaic cell and the multimeter. The wavelength was the independent variable. Different wavelengths, represented by colored filters, were used to test the hypothesis. White light was produced by mixing equal amounts of red, green, and blue light. Six samples were used (red, yellow-orange, white, green, blue, and violet light). Each sample was tested with three trials. Using the multimeter, the amperage was measured in milliamperes for each of the trials.	
Results As a general trend, a greater amount of current was generated when light of a longer wavelength fell upon the photovoltaic cell, supporting the hypothesis. However, the wavelengths of violet and yellow-orange light did not follow the trend. This signifies a relationship between wavelength and current that may not be completely linear. Outside factors may have also influenced the result.	
Conclusions/Discussion Wavelengths of light do matter in the solar energy industry. Some wavelengths, as was discovered in this experiment, generate more electricity than others. Contrary to popular belief, longer wavelengths of visible light, the ones with less photon energy, are more efficient with photovoltaic cells than shorter, more energetic wavelengths.	
Summary Statement Different wavelengths of visible light were tested for efficiency on a photovoltaic cell.	
Help Received	