



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Matthew L. Ward	Project Number S0110
Project Title Soak Up the Sun	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals In the world we are living in today, there is an enormous need for energy to power our homes, tools, and appliances. The bad thing about this is that it costs money to produce this non-renewable energy. There have been energy crises all across the U.S. in the past few years. Why not have this energy supplied to us in an efficient, virtually cost-free method? This method I'm talking about is solar energy consumption. As solar technology increases, the idea of using the sun as an energy source becomes all the more logical. The idea of this project came to me when I came across an article about NASA's solar-powered aircraft, Helios. It inspired me to try and build my own version of a solar-powered aircraft. These solar aircraft may be replacing weather and communication satellites one day because they can fly at high altitudes and for as long as the sun is shining. These solar aircraft are not only breaking records, but they are also showing the public that solar technology is a reliable energy-provider.</p> <p>Methods/Materials I began by purchasing an ultra-lightweight, remotely controlled aircraft and 2 different solar panels, and 1 type of solar cell, to go with it. I measured the different outputs I could get off of the different panels and their arrangements for a few days. I then measured the output of the aircraft's battery pack and figured out a way that I could produce the voltage and amperage I needed to power both of the aircraft's electric motors. I decided to test which type of panel, or cell, would be able to power the motors and be able to fit on the aircraft's total wing area of 200cm².</p> <p>Results I discovered that the solar cell measuring 2cm x 4cm would be the only solar panel, or cell, that I possessed that could power the motors and be able to fit on the given wing area. I have found that I would need 24 of these cells to produce the voltage and amperage I needed to power the aircraft. I also discovered that I could charge the aircraft's battery pack using a solar panel and a blocking diode, in case mounting the cells on top of the wings is inconvenient.</p> <p>Conclusions/Discussion I have concluded that it would be possible to produce the voltage and amperage needed to power the airplane, as well as staying inside the given wing area. I have also realized that solar energy is a free source of energy, which is easily gathered and already showing signs of being a large energy source in the future.</p>	
Summary Statement My project is about the design and testing of an aircraft that is powered completely by the sun sun using photovoltaic panels or cells.	
Help Received	