



# ***MASSACHUSETTS CLEAN TECHNOLOGY AWARDS***

A Program from The Foresight Project Inc

[www.theforesightproject.org](http://www.theforesightproject.org)



## **Middle School Clean Tech Awards:**

**Region V: Southeast MA**

**Recognition:**

**Kate Jamison, Sacred Heart  
Intermediate School, Kingston**

***"Building a Passive Solar Heater"***

A man named Alan M. Eddison once said, "Modern Technology—Owes Ecology—An Apology." When Kate Jamison heard this quote for the first time she thought that the scientists of today can alter modern technology's effect on the environment. An eight-grader, she took that approach when deciding on her project. Through this, Kate first came into contact with the unlimited possibilities of harnessing solar power.

Kate is interested in continuing designing and building more passive solar space heaters in the future.

### **MY PROJECT:**

The goal of this project was to build a passive solar space heater that was effective and inexpensive. I began the process of designing the heater by thinking of all the things it must be. One, it must contain a black surface to absorb sunlight and product heat. Two, it must have an input and air output. Third, it must be built so that air naturally circulates through.

The solar I built is designed to provide hot air by convection. The air comes in at the bottom of the base pyramid and is sucked up up through the warm black middle tube, heating and expanding as it rises. As the sun moves across the sky, this heater still captures its energy because of it's 360° design. Because the base and center pole of the top are painted black, it also re-radiates part of the heat that is absorbed. I originally desinged it to use professionally made solar collector panels as a base, but these were too expensive. Instead, I used an aluminum cookie sheet for the base. I learned that the design of the heater was the most important, and the base wasn't so important.



# *MASSACHUSETTS CLEAN TECHNOLOGY AWARDS*

A Program from The Foresight Project Inc

[www.theforesightproject.org](http://www.theforesightproject.org)

The solar heater that I designed has been sitting in a south-facing window, collecting sun and producing heat. I estimated that the heater would produce an average of about two degrees difference between the temperature of the air at the input and at the output. It adhered to and exceeded my expectations. The device was tested many times, and the average output temperature is two degrees Fahrenheit warmer.

In conclusion, my solar heater has an unconventional design, and is focused mainly on effectiveness and low cost. My heater is a prototype that could be improved by building a larger unit (having a larger budget.) In the future, I am interested to see how the heater works in different weather conditions.

This photo shows what my solar heater looks like, and also indicates the size of the prototype:

