

## CALIFORNIA STATE SCIENCE FAIR

## 2001 PROJECT SUMMARY



**Your Name** (List all student names if multiple authors.)

**Clara R Levrault**

**Science Fair Use Only**

**J1021**

**Project Title** (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)

**Keeping Cool**

**Division**

**Junior (6-8)**  **Senior (9-12)**

**Preferred Category** (See page 5 for descriptions.)

**10 - Materials Science**

**Abstract** (Include Objective, Methods, Results, Conclusion. See samples on page 14.)

Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.

**Objective:** My project was to determine which window covering (aluminum foil, aluminum honeycomb or window film) stopped light from heating up an enclosed space the best.

**Materials and Methods:** I made a box with a glass window and drilled a hole in the box for a thermometer. I placed a 500-watt light bulb in front of the window and recorded the temperature inside the box at two-minute intervals for fourteen minutes. I repeated this process with aluminum foil, aluminum honeycomb and window film. I compared the change in temperature for plain glass to the change in temperature recorded when different coverings were used, calculating how much cooler each was in terms of percent. The equation I used was:  $100 \times \frac{(\text{temp. plain glass} - \text{temp window covering})}{\text{temp window covering}} = \text{cooling \%}$ .

**Results:** With plain glass the inside temperature reached 113 °F. With window film, the temperature reached 78 °F. With aluminum honeycomb the temperature reached 75 °F and with aluminum foil the temperature reached 73 °F. Based on my calculations, the use of window film made the interior 194% cooler than plain glass and the use of aluminum honeycomb made the interior 253% cooler. Last, the use of aluminum foil made the interior 308% cooler than the use of plain glass.

**Conclusion:** The aluminum foil kept heat from passing through the window the best. The interior only reached 73 °F with aluminum foil compared to the 113 °F for the plain glass. Aluminum foil was the most effective window covering for keeping the interior cool.

**Summary Statement** (In one sentence, state what your project is about.)

My project was to determine which window covering (aluminum foil, aluminum honeycomb or window film) stopped light from heating up an enclosed space the best.

**Help Received in Doing Project** (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4.

My father helped me build the box and my mother helped me put my board together.