



CALIFORNIA STATE SCIENCE FAIR  
2014 PROJECT SUMMARY

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<b>Project Title</b> What Is the Effect of Reflecting Angle and Type of Reflector on the Efficiency of a Solar Cooker?	
<b>Objectives/Goals</b> The objective is to investigate the effect of reflecting angle and effect of the reflector type on the efficiency of a solar cooker. <b>Abstract</b> <b>Methods/Materials</b> In reflecting angle experiment I made three octagonal solar cookers. I wrapped the cookers with aluminum foil as reflecting material, and, set them on leveled surface with one flap directly facing the sun (reflecting flap). Flap angle is the angle of the flap with the horizontal surface. As the flap angle changes, the reflecting angle changes. Reflecting flap angles were different in different cookers, i.e. 79.3° for Cooker 1, 39.5° for Cooker 2, and 10.2° for Cooker 3. Then I placed glass bottles painted black, filled with water, mint and tea leaves, in the center of the octagonal cooking pit. To trap the heat, I covered the cookers with plastic wrap and allowed the tea to heat for an hour. Then I measured the temperature of the tea. In reflector type experiment, I covered three cookers with different reflecting materials: Cooker 1 with aluminum foil, 2 with shiny golden gift-wrap, and 3 with white wallpaper and kept reflecting angles same in all three cookers. I recorded the temperature of the tea after an hour. I repeated both experiments three times. <b>Results</b> For reflecting angle experiment repeated three times, the average temperature increase for Cooker 1 (79.3°) was 34°C, for Cooker 2 (39.5°) was 21.3°C, and for Cooker 3 (10.2°), the increase was 19°C. For the reflector type experiment repeated three times, the average temperature increase for Cooker 1 (aluminum foil) was 37°C, for Cooker 2 (shiny gift wrap) was 36.5°C, and Cooker 3 (white wallpaper) was 34.3°C. <b>Conclusions/Discussion</b> My hypotheses were supported as reflecting angle affects the efficiency of solar cookers and more lustrous reflectors increased temperature attained in tea, implying that they increased the efficiency of solar cooker. I experimented in one-hour periods as sun's position in the sky moves with time. For further studies, I will investigate how to make a solar cooker that constantly reflects sunlight to food with moving sun. As some organizations supply solar cookers to poor places, they can take this idea into account so they can make more efficient solar cookers. We can use these everyday, reducing our dependency on non-renewable sources.	
<b>Summary Statement</b> My project investigates the effect of reflecting angle of sunlight and reflector type on the efficiency of a solar cooker.	
<b>Help Received</b> Parents helped cutting the cardboard.	