



**CALIFORNIA STATE SCIENCE FAIR  
2015 PROJECT SUMMARY**

<b>Name(s)</b> <b>Jacob J. Pace</b>	<b>Project Number</b>  35414
<b>Project Title</b> <b>Up, Up, and Away?</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of my project is to explore how temperature affects the lifting ability of a helium balloon. My hypothesis is that when the helium inside the balloon is warmer relative to the surrounding air it will lift more. <b>Methods/Materials</b> Materials used: Three inflated Mylar helium balloons of the same shape and size, a #payload# of paperclips attached to each balloon with 24# of curling ribbon, thermometers, a stopwatch, and 5 different temperature environments. The number of paperclips each balloon could lift was recorded after 5 minutes at #room temperature,# as each balloon was taken into environments of 114F, 156F, 54F, 36F, and 6F, and again after 5 minutes in the new environment. Data was also collected as each balloon was taken back into #room temperature# and again after 5 minutes at room temperature. <b>Results</b> When a helium balloon is taken from a cooler temperature to a warmer temperature, it immediately lowers its payload to the ground. When a helium balloon is taken from a warmer temperature to a cooler environment, it is able to lift an increased payload of 1-2 paperclips. <b>Conclusions/Discussion</b> I was #buoyed# up after seeing that my data supported my hypothesis. The ability of a helium balloon to lift its payload increased when the helium temperature was warmer relative to the ambient air.	
<b>Summary Statement</b> The goal of this project is to discover the effects of temperature on the ability of a helium balloon to lift a #payload.#	
<b>Help Received</b> My father and mother helped type the project and transport materials to experimentation sites. Access to school kitchen#s walk-in refrigerator and freezer was granted by Carolina Amriott and her supervisor. George Brown permitted use of the sauna and steam rooms at the local GB3 Gym.	