



**CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY**

<b>Name(s)</b> <b>Grace V. Billingsley</b>	<b>Project Number</b> <b>J2003</b>
<b>Project Title</b> <b>Poison through the Roof</b>	
<b>Objectives/Goals</b> The purpose of this project was to determine if different roofing materials would affect the quality of water runoff and/or the amount of trace elements contained in the water.	
<b>Abstract</b> <b>Methods/Materials</b> To conduct the experiment, a wooden stand was hand-built and measured to the correct roofing pitch. The four roofing materials; slate, clay, composite, and metal, were cut into squares of 2 ft by 2 ft. Each roofing material was clamped to the stand and 2 gallons of water was poured over the roofing material. The runoff was collected and tested with a number of test strips for different trace elements. The test was repeated three times for each material, and the results for each kind of roofing were averaged. The averages were then compared to each other and the baseline test (tap water) to determine which roofing material had the least change, on average, from the tap water's trace element levels. The roofing material with the lowest average deviation from the baseline was determined the best roofing material for water purity.	
<b>Results</b> The slate roofing came out with an average deviation of 71.52 points per million in comparison to the baseline test. It contained abnormally high levels of dissolved solids (>500 Points per million.) Clay roofing had an average deviation of 60.79 points per million as compared to the baseline. It also had abnormally high levels of dissolved solids (>400 points per million) Composite roofing came in with a deviation of 59.65 points per million as compared to the baseline, and metal roofing came in first as the roofing material with the least deviation, at 35.8 points per million.	
<b>Conclusions/Discussion</b> This project aimed to inform people of the effects that roofing materials could have on the quality of water and its renew-ability. The results communicated that metal roofing is healthiest for the environment in terms of reusing water runoff. It will hopefully affect the choices of many property owners to help keep water renewable and make sure that no valuable water is wasted. The environment will benefit from the findings of this project; it will help to aid in the campaign to save water and effectively use resources without waste.	
<b>Summary Statement</b> This project intends to determine the effect of roofing materials on the environment as well as on the reusing and renew-ability of water runoff.	
<b>Help Received</b> Daniel Kasza provided information about composite and slate roofing tiles.	