



**CALIFORNIA SCIENCE & ENGINEERING FAIR  
2018 PROJECT SUMMARY**

<b>Name(s)</b> Sheridan Chavira; Preston Holliday; Samuel Simons	<b>Project Number</b>  38740
<b>Project Title</b> How Can We Protect Homes from Wildfires?	
<b>Objectives/Goals</b> To measure and declare the rate of burning between initial and final times between different household substances. <b>Abstract</b> <b>Methods/Materials</b> Our materials include: Baking soda (sodium bicarbonate), Ash, Chalk (calcium carbonate), Borax (sodium tetraborate decahydrate), Agar Agar (our gelatin), Xanthan gum (our thickener), a hand mixer, Distilled water, 3 inc pieces of pine wood (untreated and sanded), Blowtorch, and assorted beakers. WE started by making the foam by mixing agar agar with boiling water, then let simmer until completely dissolved. As it starts to cool use a hand mixer to froth the mixture creating a foam while also mixing in Xanthan gum to thicken it. After that we mixed 2.5%, 5%, 7.5%, 10%, and 12.5% of each household material in with 20 mL of foam in beakers. Then hand spread it onto 5 blocks of wood. Then using a blowtorch to find the initial ignition time and the final ignition time <b>Results</b> The results that came to be is that 12.5% of Borax was the most effective due to Borax being a hydrate, it releases water when heated so therefore it was the most effective. <b>Conclusions/Discussion</b> The final result ties were correct to our assumption. Borax being a decahydrate, or containing ten water molecules, was the most effective option because the more water in the substance the longer it will take to ignite.	
<b>Summary Statement</b> A cost effective and eco- friendly alternative foam to help protect houses and prevent the spread of wildfires.	
<b>Help Received</b> We used lab equipment from Rio Mesa High School under the supervision of Dr. Rano Sidhu.	