



**CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY**

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<b>Project Title</b> <b>The Science behind Cleaning</b>	
<b>Abstract</b> <b>Objectives/Goals</b> Millions of people today, perhaps also you, are being tricked and put into danger when using commercial grease-cleaning products such as Formula 409, Goo Gone, and many others. These cleaners contain hidden toxins such as sodium hydroxide or 2-butoxyethanol which disrupt the endocrine, can cause severe liver and kidney damage, and can cause pulmonary edema and severe burns when in contact. Not only do these commercial cleaning products negatively affect humans, but they also affect the environment. These chemicals are drained into waterways and sewage which can kill fish, birds, and plants. Spray cleaners also pollute the air. Knowing this, I sought to find a healthy, natural, convenient, and efficient cleaner to replace the hazardous commercial cleaners in stores today.	
<b>Methods/Materials</b> The key materials that were needed were the cleaners, a lux meter, a flashlight, plastic trays or lids, swabs, and vegetable shortening. In the procedure I dipped a swab into the solution of a cleaner and wiped it in circular motions to remove the colored vegetable oil (represented the organic soil). I did this with each cleaner in every tray and used a lux meter with range 20,000 lux and a flashlight to determine my results.	
<b>Results</b> In the end the results from best to last were in this order: Formula 409, Mr. Clean, coffee, water, baking soda and vinegar, then nothing.	
<b>Conclusions/Discussion</b> My hypothesis, that out of the chosen group of cleaning products, was somewhat supported, for coffee was not as effective as the commercial cleaners but was extremely close behind. Coffee was much easier to work with, because it had a nice aroma and did not irritate the eyes or throat. In conclusion, coffee can definitely be a substitute for commercial cleaners. Also, by replacing commercial cleaning products with natural cleaners, the benefits are quite immediate. One, natural cleaners have good aromas and have proven to be effective. Two, the environment benefits, for less waste will be produced, and chemicals will not be drained into soil or water, sparing the lives of many plants and animals. Three, natural cleaners are cheaper and more convenient, because they can be found in one's pantry and are very abundant. Lastly, the people living in your home will benefit from decreased amounts of harmful chemicals in the air and ground. If natural cleaners replaced all commercial cleaners, the risks created from cleaning will cease.	
<b>Summary Statement</b> By switching to use natural products, cleaning will be environmentally friendly, economical, aromatic, safe, and readily available.	
<b>Help Received</b> None. I built, designed, and performed the experiments by myself.	