



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Aidan M.O. Ramsay	Project Number 36395
Project Title Geopolymers vs. Portland Cement	
Objectives/Goals My goal in this science fair project was to see the practicality of a new kind of cement called geopolymer, and to see if it could be applied to construction in the real world. Abstract Methods/Materials Materials: Metakaolin (purchased from concretecountertopsupply.com) Fly Ash (provided free by Boral Material Technologies LLC) Sodium Silicate (Water Glass) Sodium Hydroxide (Lye) Sand Portland Cement w/ Sand (Mortar Mix) Safety equipment including goggles, gloves, mask, apron Small mixing container 250ml beaker Scale Stirring sticks Plastic drinking cups Method: Make four sodium silicate lye solutions and let set for 24 hours. To sample one add fly ash. To sample two add fly ash and sand. To sample three add metakaolin. To sample four add metakaolin and sand. Results Results: (result of experiment) After making samples of Portland Cement concrete and multiple kinds of geopolymer concrete, I see that the geopolymer samples are almost as easy to make as Portland cement samples (by 3.55 vs 3.15 out of 5) Conclusions/Discussion The conclusion to my experiment is that geopolymer sample is not as easy to make it sets quicker. Based on outside research geopolymer is more expensive and it is more dangerous to make than Portland cement but the advantages of geopolymer are 90% less CO2 emissions, 5 times longer lasting, and fire resistance.	
Summary Statement The fix to our hidden concrete crisis.	
Help Received My science teacher helped me narrow down my question, my dad helped me with my experiment, my mom spell and grammar checked my work	