



**CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY**

<b>Name(s)</b> <b>Alexis D. Camanga</b>	<b>Project Number</b> <b>J1504</b>
<b>Project Title</b> <b>Which Filling Materials in Sandbags Block Floodwaters the Best?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective was to find out if coarse gravel, fine gravel, or soil has the same effect as sand in sandbags for preventing floodwaters. I believe the denser the material, the more effective it will be at blocking floodwaters.</p> <p><b>Methods/Materials</b> I used burlap cloth, sand, soil, fine gravel, coarse gravel, notebook, sewing machine, bucket, 3 empty 2 liter soda bottles, water, stopwatch, and a flood table. First, I made a flood table and 50 bags. I filled half a cup of the first material in some of the bags and stacked them on the flood table so they are as tight as they can be. Three bags on the bottom and 2 on top. I ran a flood by slowly pouring 2.84 liters of water at the start of the flood table and started the stopwatch as soon as the water touched the bags and stopped it as soon as water leaked through the bag into the bucket. I recorded the seepage time. Test was done 3 times with the same materials then repeated using the other 3 materials.</p> <p><b>Results</b> This experiment showed that sand turned out to be the best material to use in sandbags for blocking floodwater. The overall average seepage time of sand compared to coarse gravel was 6.75 sec vs. 1.20 sec. The next best material was soil, then fine gravel, and lastly coarse gravel.</p> <p><b>Conclusions/Discussion</b> In the end, my hypothesis was right. The two materials that stopped the most water were the densest. Those materials were sand and soil. The information gathered from this experiment will help people know the best materials used in sandbags to block floodwaters and to save there homes and lives.</p>	
<b>Summary Statement</b> My project is to determine whether coarse gravel, fine gravel, or soil has the same effect as sand in sandbags to block floodwaters.	
<b>Help Received</b> My dad helped me build a flood table and my sister was the person recording the data in my notebook. My brother also helped control the stopwatch and my mom helped me fill the sandbags.	