



**CALIFORNIA STATE SCIENCE FAIR  
2017 PROJECT SUMMARY**

<b>Name(s)</b> Nithika Karthikeyan	<b>Project Number</b> <b>J1119</b>
<b>Project Title</b> <b>The Effect of Genotypes on Wheat's Phytoremediation Capabilities As Applied to Heavy Metals in Fracked Soil</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this experiment was to determine if genotypes (thus species) influenced wheat's phytoextraction capabilities for metals observed at fracked sites.</p> <p><b>Methods/Materials</b> A soil test was conducted using test strips to find the most suitable soil for the experiment, in this case the soil with the highest level of chromium, cadmium, mercury, and lead. This experiment used <i>Triticum vulgare</i> as the experimental group and <i>Triticum dicoccum</i> as the control group. The seeds were grown over a period of 11 weeks and were periodically watered. The height and number of stems of the plant was recorded every 3 days. At the beginning and end pictures of cells were taken using a microscope. The pictures were then compared. Levels of the heavy metals was also taken at the end of the experiment and compared to the levels seen in the beginning.</p> <p><b>Results</b> <i>Vulgare</i> did better than <i>dicoccum</i> with Lead (41.67%) and Chromium (16.67%); while <i>dicoccum</i> did 10% better for Mercury. Cadmium measurements did not lead to logical conclusions; due to which the hypothesis is partially supported, requiring further experimentation. For higher accuracy, measure contamination levels using X-ray refractometers, measure in-take within plant tissues, and conduct the experiment on soil from fracked sites in a controlled environment.</p> <p><b>Conclusions/Discussion</b> My hypothesis was partially supported because the genotype did in fact have a difference on the height, number of stems, and amount of heavy metals remediated from the soil. However, the cadmium result led my hypothesis to be partially supported.</p>	
<b>Summary Statement</b> My project is about finding out whether or not the genotype of wheat impacts the amount of heavy metals take out, or remediated, from the soil.	
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