



# CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

<b>Name(s)</b> <b>Tate N. Reynen</b>	<b>Project Number</b> <b>J1024</b>
<b>Project Title</b> <b>Soak It Up</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> In my experiment I tested which material would best absorb petroleum oil out of water: straw, wood shavings, shop towels (ultra-absorbent paper towels), Swiffer Dry Sweepers (electrostatically-charged polyester microfiber), or polypropylene pads. My goal was to find a material that would effectively soak oil up out of water without leaving behind chemicals that would pollute or harm marine life.</p> <p><b>Methods/Materials</b> I began my experiment by cutting up enough of each of my 5 sorbents to fill six one-cup measuring cups. I filled a 4-cup glass measuring cup with 24 oz. of water followed by 8 oz. of petroleum oil carefully poured on top. I then put the first cup of sorbent into a micro-screen coffee filter and slowly submerged it into the water/oil mixture. After it was fully submerged, I began a swishing motion for 15 seconds then let it sit still for another 15 seconds. I then pulled out the filter and let it drain over the measuring cup for 30 seconds, and discarded the used sorbent in a container which was taken to a local auto shop for proper disposal. I measured the total oil and water amount left in the measuring cup, then just the oil level, then just the water level, all in ounces. I recorded the data in my logbook, discarded the oil and water in the same container as the sorbents, and cleaned the coffee filter and measuring cup with dish soap and water. I tested the rest of the same sorbent 5 more times recording the results in my logbook. I repeated the process for the other 4 sorbents, and found the results fairly consistent within each category.</p> <p><b>Results</b> My experiments showed that the Swiffer Dry Sweepers were most effective in absorbing the oil (77% average absorption), versus the polypropylene pads (57%) that I predicted would be most effective.</p> <p><b>Conclusions/Discussion</b> The Swiffer Dry Sweepers absorbed the most oil possibly because of the surface area of the polyester microfibrils that make it up. Of the natural materials, the wood shavings absorbed the most--again, possibly because of the surface area of the many small pieces of wood. It would be interesting to further research if the surface area is, in fact, the key to pulling the oil out of water, and also how salt water may affect the absorption. I believe studies like this can be helpful for the oil industry, which spends over 70 million dollars to research the cleanup of oil spills.</p>	
<b>Summary Statement</b> My project attempted to discover which of five materials (shop towels, polypropylene pads, Swiffer Dry Sweepers, straw, wood shavings) best absorbs petroleum oil out of water.	
<b>Help Received</b> My mother assisted in measuring out the liquids and cleaning the containers for each trial.	