



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> <b>Miranda Brater; Rachael Brater</b>	<b>Project Number</b>  31358
<b>Project Title</b> <b>Disperse!</b>	
<b>Objectives/Goals</b> If an environmentally safe dispersant can break apart an equal or greater amount of oil when compared to harmful dispersants, then a safer dispersant to animals and humans should be used during oil clean up. <b>Abstract</b> <b>Methods/Materials</b> The project began by creating a safe workspace with a large tarp, clean up rags, one gallon containers, garbage bags, and a plastic funnel. Disposable bowls were labeled for each trial and substance being used. A 1/2 cup of water and 2tbs of motor oil were added to each bowl. 1tsp of dispersant was added to each bowl and stirred. Pictures were taken of each bowl. An increased amount of dispersant was added to the next trials. Each bowl was stirred a second time and photographed. Each bowl was emptied into disposables and utensils were disposed in garbage bag. Oil dispersal was tested with more toxic substances: Liquid Tide scented detergent, Dawn scented dish soap, and graded Ivory bar soap, followed by less toxic substances: vinegar, baking soda, sodium carbonate, and borax. <b>Results</b> Dispersal was determined by a rating scale from 1 to 5, 1 being no dispersal and 5 being completely dispersed. Tide, trials 1-12 all showed a high rate of dispersal. The average dispersal on the scale using Tide was 5. Dawn dish soap exhibited an average rating of 4. All the more toxic substances averaged to 4. For less toxic dispersants: Shaved Ivory soap, oil dispersed at an average of 3. Vinegar earned an average of 3. Sodium bicarbonate, trials 1-6 rated between 2 and 3, with increased amounts of baking soda dispersal improved in trials 7-10, but decreased by trial 11. An average rating of a 2 was reported for sodium bicarbonate. The average dispersal for sodium carbonate was 4, with increased dispersal. With an average of 2, borax scarcely dispersed. The borax acted more as an absorbent rather than a dispersant. The average oil dispersal rate for all the less toxic dispersants was a 4. <b>Conclusions/Discussion</b> The hypothesis was generally supported. A more natural substance was found to disperse oil. Sodium carbonate was the most effective more natural dispersant. Tide was the most efficient toxic substance. When more of a dispersant was added, dispersal increased. The least efficient dispersal was borax. Although there are different viscosity levels in refined oil and crude oil, this experiment supports more environmentally friendly methods of oil dispersal.	
<b>Summary Statement</b> Our project is about finding a more natural substance used to disperse oil.	
<b>Help Received</b> Advice from science instructors at our school	