



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

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Project Title Killer in the House	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal is to find out the result of household cleaners infecting radish plants and see what can be changed to help the environment</p> <p>Methods/Materials Radish plants were used because the radish grows underneath the soil, causing it to take the full influence of the cleaners. The radishes were watered with their designated solutions by bottles filled with their mixtures every 2 days</p> <p>Results The first couple of groups, detergent, detergent and chlorine, and eco-friendly detergent had very similar outcomes, small plants and leaves, then having a slow death. The next categories, soap and eco-friendly soap, had the same results as well, an immediate death to all the plants within several weeks# worth of watering. Windex and eco-friendly Windex had neutral effects; both groups grew averagely, with a regular or normal size. Toilet bowl cleaner and eco-friendly toilet bowl cleaner had very surprising outcomes. The toilet bowl cleaner did well at first; however all of sudden its stem and leaves turned thin and brown, and then wilted to the ground. On the other hand, the eco-friendly toilet bowl cleaner had very positive results and grew almost as well as the control. Its height was large, along with its numerous leaves and its healthy, green color. The control, water, was the largest of them all and had the best leaves, healthy, green and huge</p> <p>Conclusions/Discussion The detergent had the ingredient Triclosan, which is very dangerous for humans, but has an opposite reaction with plants. Plants trap the Triclosan in their soil until it is harmless and does not cause any breathing problems. Chlorine is surprising, since it is also a deadly chemical, but it is actually organic and was good for the plants. The eco-friendly detergent has chemicals such as soap that covers the roots of the plant and preventing any nutrient from being absorbed. The soap and eco-friendly soap is expecting, since soap#s reaction with plants is to block the roots from being sucked up just like in the eco-friendly detergent group. The Windex and eco-friendly Windex both have ammonia, which is used for a fertilizer so it improves the growth rate of the plants. The toilet bowl cleaner transfers chlorides through the plants stomata, causing carcinogens to build up, which explains the deaths. The eco-friendly toilet bowl cleaner has no bleach and no chlorine and no bad chemicals, just lemon oil which provided food for the plants</p>	
Summary Statement The purpose of this experiment is to find out how chemicals in household cleaners can change how a radish plant develops.	
Help Received Mother helped record measurements and make solutions; Father helped edit drafts; Scientists, Ken Rubin, Dina Lopez, and Phoebe Chang, helped give ideas on how to test	