



# CALIFORNIA STATE SCIENCE FAIR 2016 PROJECT SUMMARY

<b>Name(s)</b> <b>Megha Jain</b>	<b>Project Number</b> <b>J1013</b>
<b>Project Title</b> <b>The Water Friendly Toilet Tank: Saving Millions of Gallons of Water Daily</b>	
<div><div><b>Objectives/Goals</b> The objective of this experiment was to isolate the best detachable dual mode toilet tank apparatus design (out of the two constructed apparatuses) based on its efficiency, production cost, and water saving capacity.</div><div><b>Methods/Materials</b> Large bottle Sharpie Stopwatch Pulley wheels Small cup Lexan plastic sheets A suction bottle apparatus was made using the large bottle (with a hole drilled at the bottom), and the pulley apparatus used pulley wheels attached to the small cup. Both apparatuses were constructed on Lexan plastic. After construction, both were marked with sharpies to measure their water saving capacities, and tested 3 times each in 2 different toilets. The toilet bowl refill rate was also timed after each trial for more accuracy.</div><div><b>Results</b> The suction bottle apparatus, with a capacity of 48 ounces, saved 34 ounces (0.26 gallons) of water, while the pulley apparatus, with a capacity of 8 ounces, saved 7 ounces (0.05 gallons) of water. The suction bottle apparatus costed about \$12 to make, and the pulley apparatus costed \$15. The toilet bowl refill time was also significantly less when using the suction bottle apparatus than the time after the use of the pulley apparatus. Both apparatuses seemed to function properly.</div><div><b>Conclusions/Discussion</b> Of the two apparatuses designed, the suction bottle apparatus was more effective overall than the pulley apparatus. It was easier and cheaper to make, and saved a lot of water. This experiment has shown that there is a way to make your old toilet fairly water efficient and dual mode while spending 4% the money and a small amount of the time of installing a new dual mode toilet.</div></div>	
<b>Summary Statement</b> I invented an extremely cheap and easy to make replacement of expensive dual mode toilets that can help save millions of gallons each day.	
<b>Help Received</b> Home Depot employees in the Tool Rental section helped me drill holes with the right tools while constructing the apparatuses.	