



CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

Name(s) Isabella A. Sills	Project Number <div style="text-align: right;">34896</div>
Project Title Can 3D Printing Replace Major Retailers?	
<div style="display: flex; justify-content: space-between;"> <div>Objectives/Goals</div> <div>Abstract</div> </div> <p>The objective was to evaluate the effectiveness of 3D printing and the potential impact of how we acquire goods.</p> <div>Methods/Materials</div> <p>Eleven various items ranging from a door stop to an iPhone case were selected and printed on a 3D printer. Source files for 3D printed items were found online and available for free download.</p> <p>The amount of 3D printer filament and power consumed to print each object was measured. To account for the purchase price of the 3D printer, a depreciated cost was determined for each part based upon the idea of printing on average 20 items per month over the expected printer life span of 5 years.</p> <p>Per part costs were then calculated based on the per part measured costs and a portion of the cost of the 3D printer.</p> <div>Results</div> <p>3D printed parts of differing sizes affected the measured values. The calculated per part 3D printing costs ranged from \$0.55 to \$5.76 while the comparable retail products ranged from \$2.12 to \$22.50. The overall cost for all 3D printed items amounted to only \$16.80 while the comparable store bought items would have amounted to \$131.27.</p> <div>Conclusions/Discussion</div> <p>The findings showed that it can be significantly more cost effective to 3D print most items rather than purchasing them from a store. Overall, the costs of the 3D printed items were consistent and much lower. Additionally, I had the ability to easily manipulate various characteristics of the printed items. I could easily change the color, size, or even create items not even available from a retailer.</p> <p>The study showed that 3D printing can significantly disrupt the retail environment. The creation of items at home has the potential to impact manufacturers, distributors, and retailers.</p>	
<div>Summary Statement</div> <p>Is it more cost effective to 3D print goods versus buying them at the store, and if so what potential impact will this cause for retailers?</p>	
<div>Help Received</div> <p>My father showed me how to setup the 3D printer and use the software.</p>	