



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

Name(s) Isabella A. Sills	Project Number J2115
Project Title Can 3D Printing Replace Major Retailers?	
Objectives/Goals The objective was to evaluate the effectiveness of 3D printing and the potential impact of how we acquire goods.	
Abstract	
Methods/Materials 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. 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. Per part costs were then calculated based on the per part measured costs and a portion of the cost of the 3D printer.	
Results 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.	
Conclusions/Discussion 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. 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.	
Summary Statement 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?	
Help Received My father showed me how to setup the 3D printer and use the software.	