



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Zack B. Hirschhorn	Project Number J1309
Project Title The Most Force Absorbent Material	
Objectives/Goals The objective of this project was to compare four materials (as well as no material) and determine which one absorbs the most force.	
Abstract Methods/Materials The materials used were one box of play-dough, two books (9.75 inches by 11.25 inches by 1 inch each), a viscoelastic material (pillow), a pillow made of polyester fiber, a pillowcase full of styrofoam peanuts, newspaper, a roll of bubble wrap, and a ruler. After all the materials were collected, the play-dough was molded into a rectangular prism (5 cm tall). The play-dough was then placed on a book on the floor, with no material protecting the play-dough. Another book was dropped on to the play-dough from six feet above. The height of the now-compressed play-dough was measured. These steps were then repeated using the different materials to protect the play-dough: bubble wrap, newspaper, a polyester fiber pillow, and a viscoelastic material (pillow). Each material (as well as no material) was tested four times.	
Results The average height and standard deviation (s) of the clay when protected by each material was as follows. No material: 1.68 cm (s = 0.37 cm), newspaper: 2.59 cm (s = 0.27 cm), bubble wrap: 3.05 cm (s = 0.2 cm), polyester fiber (pillow): 3.61 cm (s = 0.5 cm), viscoelastic material (pillow): 4.19 cm (s = 0.08 cm), and styrofoam peanuts: 4.28 cm (s = 0.08 cm).	
Conclusions/Discussion The styrofoam peanuts absorbed the most force, with the clay being an average height of 4.28 centimeters when protected by it. The viscoelastic material absorbed the second most force, with the clay being an average height of 4.19 centimeters when protected by it. Newspaper absorbed the least force with the clay being an average height of 2.59 centimeters when protected by it. The hypothesis was that the viscoelastic material would absorb the most force. The hypothesis was proven incorrect.	
Summary Statement This project tries to find the packaging material that absorbs the most force.	
Help Received Mr. Hartung helped me revise my report. My father helped to come up with the project idea. .	