



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

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| Name(s) Christian Arnold; Carson Coppinger | Project Number 34094 |
| Project Title How Does Temperature Affect How Far a Baseball Travels? | |
| Abstract Objectives/Goals The objective of our experiment was to see if the temperature of a baseball affects the distance it travels when bounced off a wall. Methods/Materials 1. 30 baseballs , 2. Pitching machine, 3. Oven, 4. Freezer, 5. Measuring tape, 6. Wooden Wall. We began by setting up a pitching machine fifteen feet away from a wooden wall. Then we took 10 heated, 10 cooled, and 10 room temperature baseballs and shot them at the wall one at a time. Then we measured the distance each ball bounced back and recorded it. We repeated this process again for each group. Results Data Summary The baseballs that were heated bounced off the wall at an average distance of 69.9 centimeters. The baseballs that were room temperature bounced off the wall at an average of 51.8 centimeters. The baseballs that were cooled bounced off the wall at an average of 39.5 centimeters. Our results showed that the warm baseballs went farther than the cold baseballs by an average length of 30.4 cm. Conclusions/Discussion Conclusions and Discussion Our hypothesis appears correct. The baseballs that were heated up bounced further off the wall than the room temperature and cooled baseballs. The baseballs that were left at room temperature bounced further off the wall than the cooled baseballs but not as far as the heated ones. The baseballs that were cooled down didn't bounce as far as the room temperature baseballs or the heated ones. We think this happened because when the balls are heated up the molecules have more energy, so they move around faster, increasing movement. When the leather cover and insides are heated up, the ball is more elastic and has more give. When baseballs are cooled down they are harder which causes them to thud off the wall. Our experiment is important because baseball players (using wood bats) could possibly hit the ball farther or shorter in different temperatures. Baseball players (using wood bats) could possibly hit the ball farther in hot weather and shorter in cold weather. For example someone who plays in Palm Springs could have better hitting stats than someone who plays in Denver. | |
| Summary Statement Our project is about how temperature affects how far a baseball travels. | |
| Help Received Dad helped heat and cool the baseballs | |