

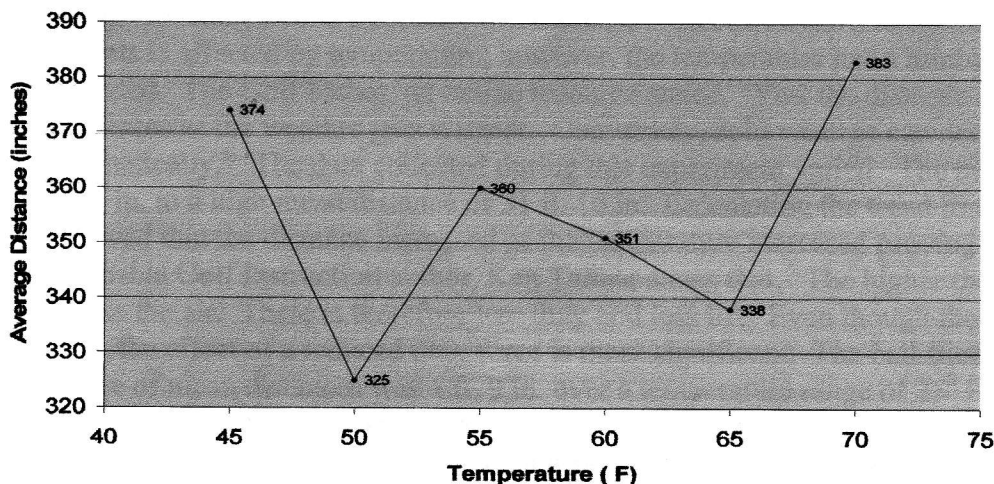
Materials and Procedures

To complete each set of trials, the materials needed were a 100 foot tape measure, the golf ball, and a trebuchet. The main piece of equipment was a homemade trebuchet. The trebuchet was built by modifying a design found in a book. Once the trebuchet was in working order, collecting the trial data could begin. Each trial was completed if the outside air temperature, determined by accuweather.com, was one of the desired trial temperatures (45⁰F – 70⁰F by multiples of five). Otherwise, the trial was postponed until the desired temperature was reached. When the desired outside temperatures were reached, the trebuchet was set up and screwed into the driveway and all of the supplies were set up. The tape measure was attached to the trebuchet and pulled out so that it could be read to record the distances the golf ball travels. The golf ball was launched for a total of 50 trails for each given temperature desired. This was repeated for all of the desired temperature readings twice.

Results

There were 600 trials conducted with six different temperature readings in this investigation. The average distances had a range that varied by 4 ft 9 in. With a range this small, the data showed consistency in the launches. The box and whisker plot showed that all six trial interquartile ranges only varied by 2 ft. 9 in. The data showed that the middle 50% of the data in each trail was fairly evenly spread out. The whisker data was much more spread out according to the box and whisker plots. The medians were identical on the 45⁰ and 55⁰ data sets. The 50⁰ trials had the smallest interquartile range at 5 feet while the 70⁰ trial had the greatest interquartile range of 7 feet 9.5 inches. None of the trials had any outliers. Two trials had data within 2 inches of the outlier mark; however; they all fell short. The highest distance traveled (42 feet 11 inches) occurred in the 70⁰ trail and the shortest distance (18 feet 9 inches) occurred in the 50⁰ trial. All of the data had at least one mode, which appeared a minimum of three times during the trial. During the 60⁰ trial, the mode of 351 (29 feet 3 inches) occurred 5 times, 5%. The data for this experiment offers much information.

Temperature vs. Average Distance A Golf Ball Travels When Launched From A Trebuchet



Temperature (°F)	Average Distance (ft.)
45	31.2
50	27.11
55	29.98
60	29.24
65	28.15
70	31.88