



CALIFORNIA STATE SCIENCE FAIR 2008 PROJECT SUMMARY

Name(s) Beau Bayless; Trevor Foss	Project Number J0202
Project Title How Does Changing the Air Pressure of an Air Gun Affect the Average Speed of the Pellet?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Objective- Our objective was to find how changing the air pressure of an air gun affects the average speed of the pellet. We thought that if you double the air pressure, the average speed will double, if you triple the air pressure, the average speed with triple, and so on.</p> <p>Methods/Materials Materials and Methods- We constructed an air gun that would shoot pellets at variable pressures through a barrel with a sensor at the beginning and the end. Then we set the pressure to 100 psi and fired the air gun. Then we recorded the time that the pellet took to pass through the first and second sensor and used the formula $\text{Speed} = \text{Distance} / \text{Time}$, to get the speed. Then we repeated those steps four more times and we averaged the five speeds. After that we repeated that procedure, increasing the air pressure by 100 psi each time until we reached 500 psi.</p> <p>Results Results- Our graph shows the average speed for each of the gas pressures. For 100 psi the average speed was 58 meters per second, 200 psi produced 77 mps, 300 psi produced 95 mps, 400 psi produced 105 mps, and 500 psi produced 109 mps.</p> <p>Conclusions/Discussion Discussion- We concluded that our hypothesis was wrong in the saying that doubling the psi would double the average speed. However, we discovered that although increasing the pressure increased the speed, as the psi increased, the increase in the average speed decreased. Between 100 psi and 200 psi the average speed increased by 18.6 mps, but between 200 psi and 300 psi the average speed only increased by 17.9 mps, between 300 psi and 400 psi the average speed increased by 10.8 mps, and between 400 psi and 500 psi the average speed increased by 3.4 mps. We think we got these results because the greatest change in pressure is between 100 psi and 200 psi. 200 psi is twice the pressure of 100 psi. 300 psi is only 1.5 times as great as 200 psi. 400 psi is 1.3 times as great as 300 psi and 500 psi is 1.25 times great as 400 psi. So the increases in pressure were also proportionally less. Our experiment is important because it tells people how fast their airsoft guns shoot. People can use this because most airsoft gun's speed is a guess based on distance and impact. This experiment can tell people how fast their airsoft guns really shoot and if airsoft manufacturers are lying about speed to increase sales.</p>	
Summary Statement Our project is about how changing the air pressure of an air gun affects the average speed of the pellet.	
Help Received Trevor's dad helped sauter the wire board.	