

## **Lorne Muir II**

Junior Division Physics

### *Hail! No!*

The purpose of this investigation was to test if hail can cause chips in windshields of cars without cracking or shattering the windshield. I hypothesized that if four to five centimeter (golf ball) size hail hits a windshield over 35.8 meters/second, then the windshield will chip. This experiment involved creating an air pressure gun out of PVC pipes that would be able to shoot hail. I had to make four different size barrels to create 1.27 cm (0.5"), 1.9 cm (0.75"), 2.54 cm (1"), and 3.18 cm (1.25") sized hail. I also had to create a stand for the windshield in order to adjust the angle (45, 63, and 90 degrees) at which the hail hits the windshield. The hail was then shot using the air pressure gun through a chronograph to measure the speed of the hail in meters/second. Windshield damage was then recorded using a damage scale: 0 - no damage observed (least damage), 1- chipped, 2 - cracked, and 3 - shattered (most damage). Five trials were performed for each size of hail with each angle. The data collected did not conclusively support the hypothesis. On average, no significant damage was noted to the windshield after 60 trials. Only one chip was noted in Trial 5 with 2.54 cm hail at a 45 degrees windshield angle. I was not able to duplicate the results. These findings lead me to believe that hail has the potential to chip a windshield. More testing is necessary in order to confirm results.