McKenzie, Loz

Mrs. Gallivan

Science 8th

5/20/2024

Stomp Rocket Analysis

The Stomp Rocket was an experiment that applied the concepts of physics to design and build a stomp propelling rocket that will travel the furthest distance possible. To give the stomp rocket a design my team and I had to incorporate the four elements of flight. The four elements of flight are lift, drag, thrust and weight. The thrust for the rocket in opposition to weight, the lift was to stabilize the rocket and control the direction of the flight, the weight is the force due to gravity pushing down on it pulling it downwards and the drag was to maintain a stabilized direction to fly. The first thing my team and I had to do was incorporate Newton’s Laws of Motion into this design to complete it successfully. Acknowledging the fact that in Newton’s First Law of Motion it states that objects will stay at rest and objects in motion will stay in motion in a straight line unless acted upon by an unbalanced force. With that and inertia we knew the rocket would go in the same direction until acted upon by an unbalanced force and gravity was pushing down and acting on it. Once we figured that out we knew we needed to make it as light as possible and be careful about what materials we used. Using Newton’s Second Law with force equals mass times acceleration we figured out the heavier an object was the more force you needed to accelerate it. Finally, with Newton’s Third Law for every reaction there is an opposite reaction. Wefigured out that since there was an equal and opposite reaction it helped us change our design a few times to improve distance. When building our design we took it upon ourselves to make multiple tests, but with tests comes some positives and negatives. For Test 1 the positives were flying, traveling a long distance and fit into the launch area. The negatives for Test 1 were the wind and air resistance. Test 2 was our final design with it having certain new changes like fin arrangement, sharper nose and less tape. The positives for this design was lots of range, stability and the tip is durable. The negatives for Test 2 were internal ripping and fragile flaps. The internal ripping in our second design which was our final design was fixed with more tape and a vast source of other materials. Test 1 in the end did prove to be useful to give us feedback and learn from our mistakes. In conclusion with Test 1 it was a starting prototype that never worked again, but set forth in motion a new and improved design. Our Second design which was also our final design incorporated elements of the first design such as tape, a light use of paper and a sharp tip with an addition of my team and I adding more to it. While launching the rocket we discovered that it had more internal ripping, a problem that tape could easily fix. Our rocket had 3 fins, sharp, lots of tape, sharp nose and very long. The fins in our design were curved at the ends, medium length and rectangular. The rocket's mass was 5 grams and its length was 13.25 inches which was pretty light and really helped us go a very far distance. The maximum distance we flew was 25 meters or 75 feet. In conclusion our design applied Newton’s Laws of Motion, inertia, the four forces of flight and physics which helped our little experiment travel a very far distance.