**Name(s)**
Nickolas W. Zurlinden

**Project Number**
J0134

**Project Title**
Stability of Rockets

**Abstract**
I believe that if a rocket's center of gravity (CG) is significantly ahead of the rocket's center of wind pressure (CP) it should fly stably. By increasing the distance between the center of the gravity and the center of wind pressure the rocket's stability will increase the rocket's performance in flight.

**Objectives/Goals**
Objectives/Goals

**Methods/Materials**

**Materials:**
- Balsa wood (fins); - Rocket engine (for accounting for the engines weight); - Cardboard tube (rocket fuselage); - Fishing weight (moveable weight inside the rocket); - Internal rail for accurately placing weight; - Glue; - String; - Wind tunnel.

**Results**
Observations:
- When I tested my rocket at CG zero the rocket was so unstable it flew backwards, but by the time I got to CG point number six, by five to six revolutions it righted itself and went nose first. By CG point number ten the rocket became stable by one and three quarters to two and a half revolutions. This shows that you can make a rocket more stable by changing the CG point.
- In order to keep your results fair and constant for testing purposes I kept the revolutions per second between one and two.

**Conclusions/Discussion**
I have determined that a rocket flies more stably if the center of gravity (CG) is in front of the center of wind pressure. If the distance between the CG and the center of wind pressure is greater, the rocket will also be more stable.

**Summary Statement**
Investigate rocket stability based on the relationship of the center of gravity (CG) and center of wind pressure.

**Help Received**
Father helped me modify my school's wind tunnel.