



**CALIFORNIA STATE SCIENCE FAIR  
2008 PROJECT SUMMARY**

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<b>Project Title</b> Stability of Rockets	
<b>Objectives/Goals</b> I believe that if a rocket's center of gravity (CG) is significantly ahead of the rockets 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 rockets stability will increase the rockets performance in flight.	
<b>Abstract</b>	
<b>Methods/Materials</b> Methods: 1. Build rocket of random design. 2. Create internal weighting system for rocket. 3. Find rocket center of gravity (CG) by hanging from string. 4. Incrementally move weight system and spin test rocket for each weight position. Take data for each position. 5. Verify spin data with wind tunnel testing if possible. Take data for each postion. 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.	
<b>Results</b> 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 it self and went nose first. By CG point number ten the rocket became stabile by one and three quarters to two and a half revolutions. This shows that you can make a rocket more stabile 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.	
<b>Conclusions/Discussion</b> 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.	
<b>Summary Statement</b> Investigate rocket stability based on the relationship of the center of gravity(CG) and center of wind pressure.	
<b>Help Received</b> Father helped me modify my school's wind tunnel.	