***Question:***

What is G.H.O.P.S.?

***Answer:***

The Gyroscopic H.O.P.S. consists of two main components: a spherical wire outer frame and an inner pole with a differently-weighted concave plate at each end. These two parts rotate about each other. The bottom plate will be heavier than the top one. The thrusters will apply a force with a large horizontal component so that the center of gravity is displaced from its lowest position. In other words, the heavier plate will rotate to where it is behind the astronaut. The ball will now roll forward due to the thrust exerted and due to the moment produced by the return of the heavier plate to its starting position. When H.O.P.S. is rolling, the astronaut will be rocking back and forth in his seat. If the thrusters exert thrust with a great enough vertical component, H.O.P.S. will lift off the ground and will be able to fly as normal.