Apparatus & Procedure

Equipment:

Multi-speed drill – Power Glide Electric Drill, 0-3000 RPM– 22.49

Metal rods – Stainless steel ASTM-A582, 5/8" OD, 36" Length **–** 11.63 **x 2**

Footballs – 9.99 **x 2**

Tachometer – Digital Contact Tachometer – 29.99

Epoxy – Adheres to plastic, metal and wood – 4.99

Football pump – hand air pump – 1.88

Total = 102.59 (Consider taking off a metal rod, and replacing with another football?)

The football will have a hole cut on one of the tips where the metal rod can be inserted. The football will then be sealed with epoxy and inflated with the football pump. The metal rod will be directly attached to the drill which will provide the variable rotation of the football. The rotation will be measured by the tachometer that will attach to the metal rod and will be kept at that rotation speed for the duration of that run.

Testing condition:

Change Rotation speed of football and Reynolds number of wind tunnel to determine drag of football and see if there is a significant change.

Types of measurements:

Determine drag by fluid momentum conservation aka the wake profile. This will be achieved by using the pitot tube on both the left and right side of the foot ball.

Results will be presented in the form of Cd vs Re # for each rotation speed we decide, we could overlay all the results onto one graph if we wish.