Lecture F10 Mud: Aircraft Performance Analysis

1. **Is there some way to calculate D_o or does it have to be determined experimentally?** (1 student)
   For fairly simple fuselage shapes there are a number of drag estimation techniques. One of the best drag handbooks is *Fluid Dynamic Drag* by Hoerner. But the open-framework fuselage of the Dragonfly is terribly complicated, and measuring its D_o (or its drag area C_DoS_o to be more precise) is the only reliable way to do it.

2. **Coupling of the variable is unclear.** (1 student)
   The coupling between variables is case-dependent. On a stubby-wing jet fighter, the % weight penalty of increasing aspect ratio is far smaller than on a long-winged transport airplane. Determining what couplings are important is a matter of generating data for the design problem at hand, whether by analysis, experiment, experience, or historical research.

3. **In the PRS, why did the $t_{\text{old}}/t_{\text{new}}$ calculation have $1.06^{3/2}$ rather than just 1.06?** (1 student)
   The 1.06 factor was for the weight W, which in the formula appears as $W^{3/2}$. So any scaling applied to W must get the same 3/2 exponent.