iFLY Education Program
North Carolina Middle School Standards Alignment
http://www.dpi.state.nc.us/curriculum/

Field Trip Activity	Standard
Interactive Presentation: • Students predict, observe, record, and analyze the velocities of different objects in the wind tunnel. • Use a free body diagram of a skydiver to discuss the forces acting on his/her body • Discuss that when forces are balanced (net force = 0), acceleration is zero, and a skydiver achieves "terminal velocity" • Discuss the difference in frames of reference between the wind tunnel and skydiving, i.e, in the wind tunnel the flyer is still and the air is moving, while in free flight the air is still and the skydiver is moving • Identify when the gravitational force or the force of air drag is dominant. Discuss the effect this has on a skydiver's velocity and acceleration. • Educator leads a discussion about engineering careers, the engineering process as applied to the design of iFLY tunnels, and other applications of wind tunnels in STEM	Science: 7.P.1
LAB ACTIVITY • Students break into small groups and brainstorm ways to measure the variables required for solving the lab activity • Students measure the mass and circumference of various objects using scales and tape measures. They use geometric formulas to calculate surface area. All calculations are made using SI units. • Students use Microsoft Excel to calculate the theoretical terminal velocities of the objects in the wind tunnel. • The educator leads the class through a discussion of differences between the students' calculated terminal velocities of the objects and the actual measured velocities in the wind tunnel. The class discusses possible reasons for the discrepancies between the two values. • The class makes connections between the lab activity and the activities of professional scientists and engineers and the importance of wind tunnel testing.	Science: 7.P.1 Math: NC.6.NS.3 NC.6.EE.2, NC.6.EE.6, NC.6.EE.7 NC.7.NS.3 NC.7.EE.3 NC.7.G.4 NC.8.EE.2, NC.8.EE.7

Post-field trip classroom activity • Students measure their mass and frontal area to calculate their predicted terminal velocity in the wind tunnel. • Students compare their predicted velocities to known velocities of other people and objects and determine if they have arrived at a reasonable solution. • Students brainstorm possible reasons for error in their theoretical values.	Science: 7.P.1 Math: NC.6.NS.3 NC.6.EE.2, NC.6.EE.6, NC.6.EE.7 NC.7.NS.3 NC.7.EE.3 NC.7.G.6