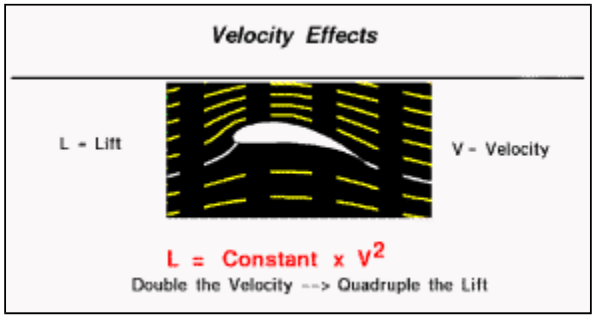
Velocity Effects and Constants
Worksheet



Keeping in mind that the Lift is directly proportional to the square of the Velocity, calculate and record the Constant for each entry in each table.

Wright Brothers	Area of two wings:	Span of two wings:	Chord of one wing:
Velocity:	**Velocity^2:**	**Lift:**	**Constant:**
0			
25			
50			
75			
100			
125			
150			
175			
200			
225			
250			

F-18	Area of two wings:	Span of two wings:	Chord of one wing:
Velocity:	**Velocity^2:**	**Lift:**	**Constant:**
0			
25			
50			
75			
100			
125			
150			
175			
200			
225			
250			

Student Names: _____

Boeing 747	Area of two wings:	Span of two wings:	Chord of one wing:
Velocity:	**Velocity^2:**	**Lift:**	**Constant:**
0			
25			
50			
75			
100			
125			
150			
175			
200			
225			
250			

Questions:	Answers:
Are the constants exactly the same for all entries in each individual table? Why or why not? List possible sources of error.	
Are the constant values the same for each aircraft? Discuss and list some reasons for this.	
Which values were kept the same in FoilSim for all aircraft in this activity?	
Which values in FoilSim differed from aircraft to aircraft in this activity?	
The "Constant" values you calculated come from the values that are held constant (not changed). Now, which values do you think are included in the "Constant" value for each aircraft?	
Could these values ever be considered variables? If so, when and how? If not, why not?	
Now, suppose *your aircraft from the Wing Areas worksheet* is loaded down with cargo and extra fuel for a long flight so that it weighs 12,500 pounds before takeoff. **What speed will it need to acquire before it has enough lift to get airborne? {Hint: On the ground the altitude and angle are both zero. Also, use 0.5 for the camber and 15.0 for the thickness.}**	