Air Resistance and Terminal Velocity
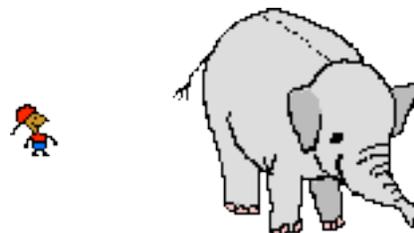
Read from **Lesson 3** of the **Newton's Laws** chapter at **The Physics Classroom**:

http://www.physicsclassroom.com/Class/newtlaws/u2l3e.html

MOP Connection: Newton's Laws: sublevel 11

1. When falling under the influence of air resistance and
    dropped from the same height, which will fall to the ground
    at a faster rate?
   a. a mouse   b. an elephant   c. the same

2. Which of the following variables will have a direct effect
    upon the amount of air resistance experienced by an object?
    (That is, for which of these quantities will an increase lead to
    a resulting increase in the air resistance force?)
    a. speed   b. air density   c. cross-sectional area

3. Consider the dragster's motion below. Speedometer readings and the forward propulsion force
    (F_{app}) are shown. The top (or terminal) speed is 120 mph. Draw F_{air} force arrows on each diagram
    to illustrate how the amount of air resistance changes during the course of its motion.
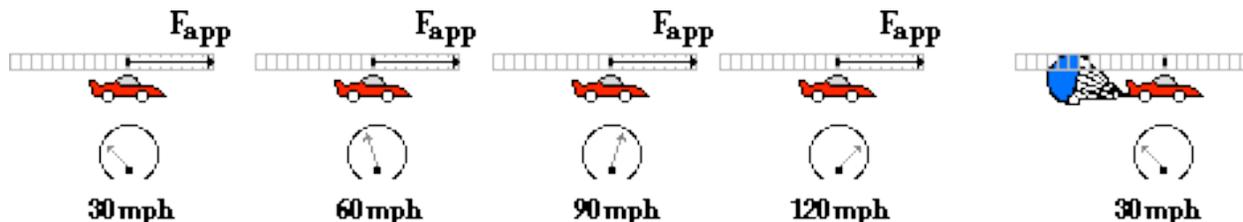
4. Draw F_{air} force arrows to show how the force of air resistance changes on the falling skydiver. At
    A, the diver has just jumped; and at **E**, the diver has just reached terminal velocity.
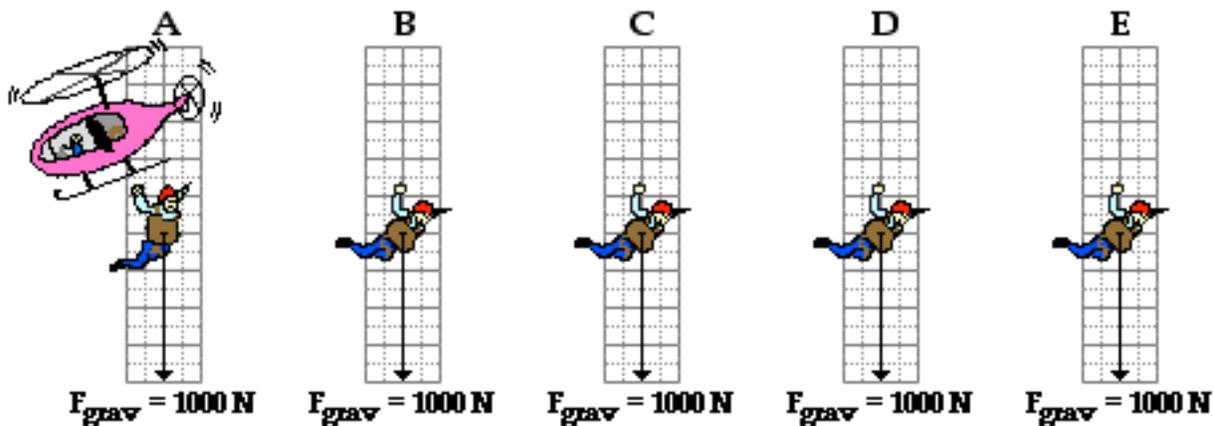
5. Fill in the blanks in the following paragraph.

    As an object moves faster and faster, the amount of air resistance _____ (increases,

    decreases) until a state of terminal velocity is reached. Once terminal velocity is reached, the force of

    air resistance is _____ (greater than, less than, equal to) the force of gravity. Hence,

    the object will _____ (continue to accelerate, stop its motion,

    stop its acceleration, move back up to its starting position).