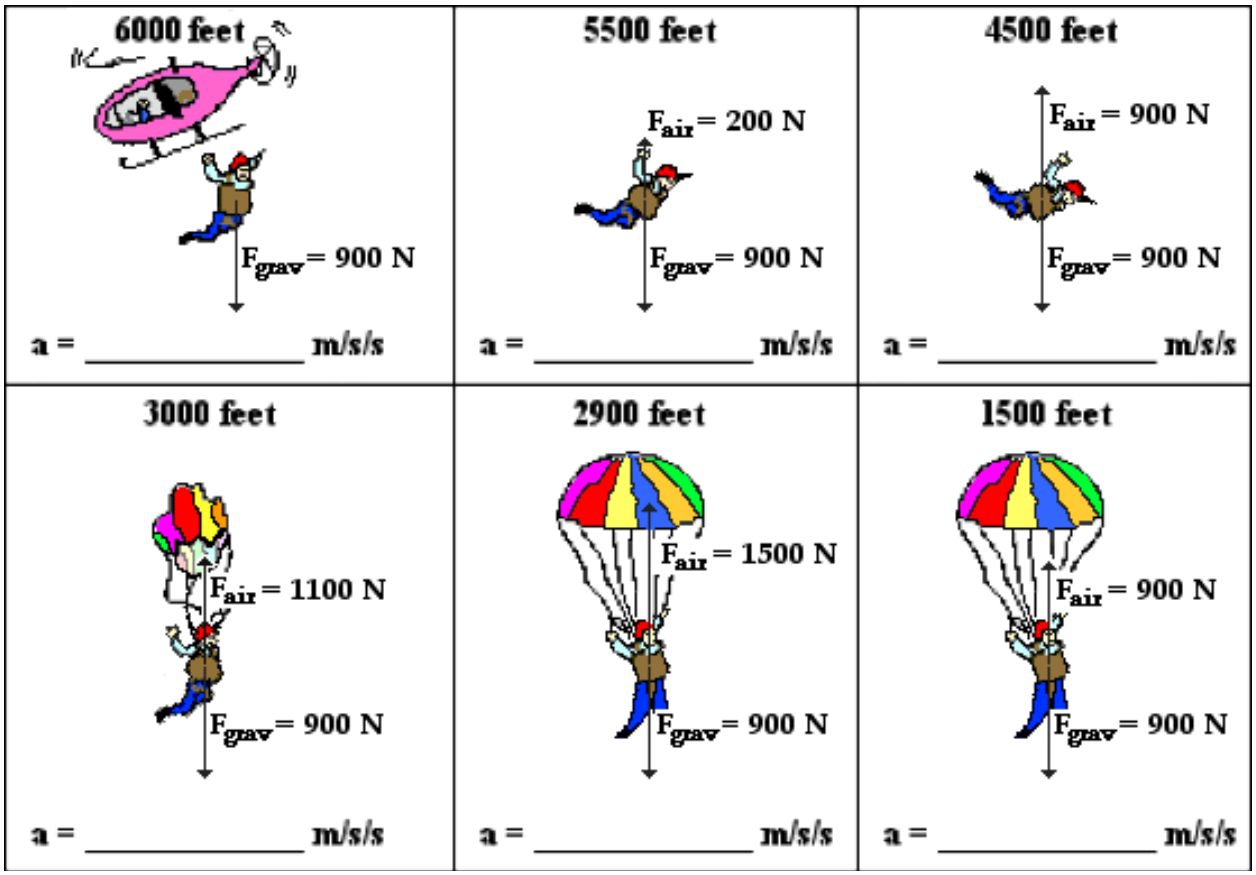
Skydiving

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

A 90-kg (approx.) skydiver jumps out of a helicopter at 6000 feet above the ground. As he descends, the force of air resistance acting upon him continually changes. The free-body diagrams below represent the strength and direction of the two forces acting upon the skydiver at six positions during his fall. For each diagram, apply Newton's second law ($F_{net} = m \bullet a$) to determine the acceleration value.



1. At which two altitudes has the skydiver reached terminal velocity? _____
2. At which altitude(s) is the skydiver in the state of speeding up? _____
3. At which altitude(s) is the skydiver in the state of slowing down? _____
4. At 2900 feet, the skydiver is _____. Choose two.
   a. moving upward b. moving downward c. speeding up d. slowing down
5. Explain why air resistance increases from 6000 feet to 4500 feet.

6. Explain why air resistance decreases from 3000 feet to 1500 feet.

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