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## Terminal Velocity

(These notes are not on the Weebly site.)

When an object moves through a fluid such as air, the force of friction increases as the velocity of the object increases.

A falling object eventually reaches a velocity at which the force of friction is equal to the force of gravity.

$$F_f = W$$

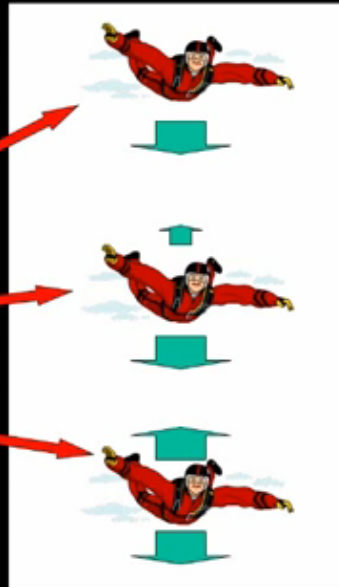
At that point, the net force acting on the object is zero and it no longer accelerates but maintains a constant velocity called terminal velocity. The shape and orientation of an object affects its terminal velocity.



## Terminal Velocity

Consider a skydiver:

- 1) At the start of his jump the air resistance is **zero** so he **accelerates** downwards.
- 2) As his speed increases the air resistance will **increase**
- 3) Eventually the air resistance will be big enough to **equal** the skydiver's weight. At this point the forces are **balanced** so his speed becomes **steady** - this is called **TERMINAL VELOCITY**

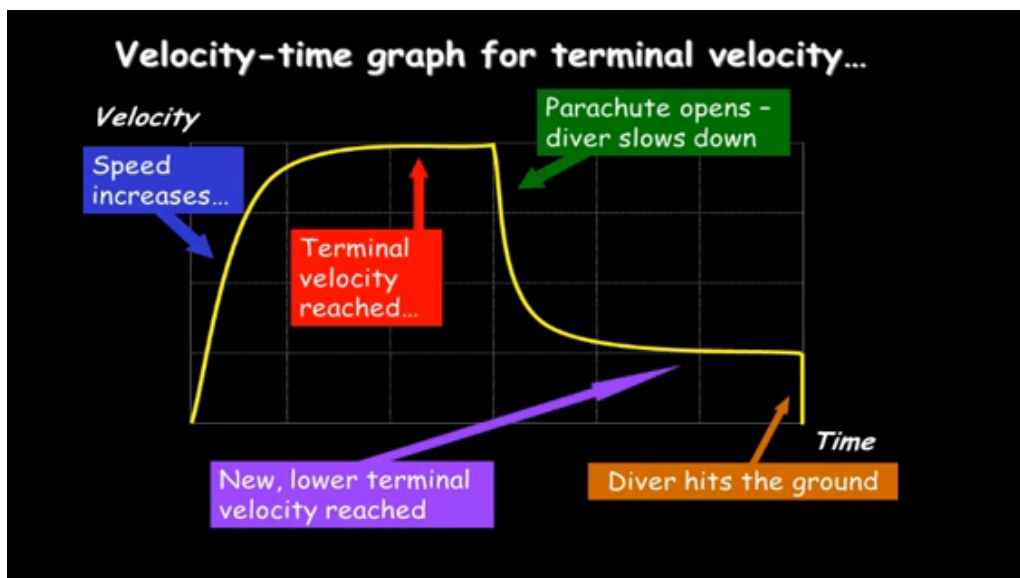


## Terminal Velocity

Consider a skydiver:

- 4) When he opens his parachute the air resistance suddenly **increases**, causing him to start **slowing down**.
- 5) Because he is slowing down his air resistance will **decrease** again until it balances his **weight**. The skydiver has now reached a new, lower **terminal velocity**.





<http://www.youtube.com/watch?v=ur40O6nQHsw>



<http://www.youtube.com/watch?v=HrqXTHCGVEo>

