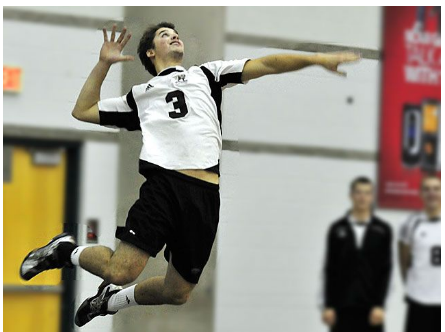
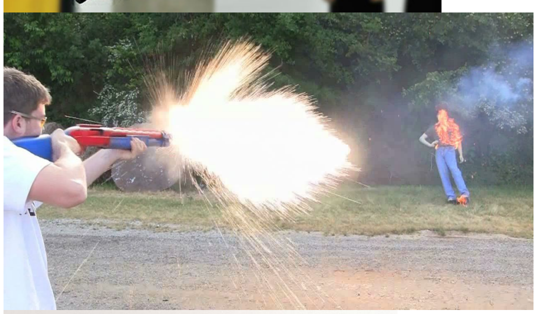
Launch it.
Fling it.
Shoot it.

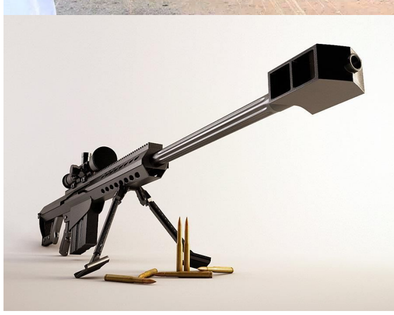
Three scenarios.



Connor spikes a volleyball.



Christo shoots a shotgun.



Jeremy fires a .50 cal.

They all hit from a height of 1 meter. Which hits the ground first (ball, slug, bullet)?

Sketch a displacement vs time graph for the following:

Forward constant velocity	Forward acceleration
Backward constant velocity	Backward acceleration
Forward deceleration	Backward deceleration
Object at rest	

Sketch a velocity vs time graph for the following:

Forward constant velocity	Forward acceleration
Backward constant velocity	Backward acceleration
Forward deceleration	Backward deceleration
Object at rest	

Kinematics is the study of motion.

d
slope ↓   ↑ area
V
slope ↓   ↑ area
a

As such - it is a very formula dependent section. There are 4 main ones.
In general,

$$d = vt$$

But what if the velocity is not constant?

If my acceleration is constant (and it will be) then my velocity will increase at a constant rate.

$$d = \frac{v_f + v_0}{2} t$$

Since acceleration will be taken to be constant:

$$v = at$$

Compare this to the general formula for a line…

Probably our most useful formula (the sum of a box and a triangle).

$$d = v_0 t + \frac{at^2}{2}$$

Our final formula is a consequence of the Law of Conservation of Energy.

$$v_f^2 = v_0^2 + 2ad$$

To find how this formula comes to be solve these formulas for t.

$$d = vt \text{ and } v = at$$

You should be able to go through the practice problems and quick check of section 2.1

*number 8 on page 54 may be tricky - vector decomposition will help you. It is not necessary to do this one. Consider it "funsies".