Reading Assignment for September 27
Sections 5.2 through 5.4

Please notice that this file is two pages long.

5.2 - Dynamics and Newton's Second Law

- The most important thing to realize when applying Newton's Second Law is that acceleration is *NOT* a force. In other words, there are no new forces acting on an object when it accelerates. The forces we identify for an accelerating object are the same that we would identify on a object moving at a constant speed (or even at rest!). The only thing that changes are the magnitudes and sometimes the direction of forces.
- It is also very important to remember to add the components of the forces: $\sum F_x = ma_x$ and $\sum F_y = ma_y$!

5.3 - Mass and Weight

- The first part of this section is review for us since we've already gone over in class that $w = mg$. Hopefully the book's discussion will cement this fact and help it make sense.
- Apparent Weight - I prefer to think of apparent weight as another name for the normal force.
- Weightlessness - People experience weightlessness when their apparent weight is zero. You can experience weightlessness on earth.

5.4 Normal Forces

- We've discussed in lecture many times how the normal force is perpendicular to the surface.
- The normal force does not have to be equal to an object's weight.
- Apparent Weight - The normal force acting on an object. When accelerating, the apparent weight is different than the weight ($w = mg$).

- This section introduces the incline problem. The most convenient axes in this case are parallel and perpendicular to the surface. This causes us to use a non-standard angle. Notice how the component of weight along what they call the x-axis uses $\sin\theta$ while what they call the y-axis uses $\cos\theta$. To help students, I usually call these axes parallel ($\parallel$) and perpendicular ($\perp$).