Study Guide for Quiz #2

(Covers material contained in Chapters 4, 5, 6, and 7)

Chapter 4

- What is Newton's Second Law of Motion?
- What is friction?
- What is mass?
- What is terminal velocity?

$$F = ma$$

- Friction resists motion and acts in a direction opposite to an applied force.
- Weight is the force of gravity on an object.
- When the acceleration of a falling object is equal to "g" it is in "free fall"
- The kilogram (kg) is a measure of an object's mass.
- The unit of force in the Newton (N).
- If the net force on an object doubles, the acceleration doubles

Chapter 5

- What is Newton's Third Law of Motion?
- What is the resultant of two vectors?
- What are vector components?

- Action and reaction forces act on different objects.
- To determine the forces on an object you need to isolate the object.
- Internal forces within an object or system do not affect the object's motion.
- Force is a vector quantity (it has direction and magnitude)

Chapter 6

- How can we control the impulse delivered from an impact?
- What is the change in momentum in a bounce versus no bounce?
- What is the conservation of momentum?
- What is the difference between elastic and inelastic collisions?

- Impulse = change in momentum
- Momentum = mass times velocity.
- Momentum can be called the inertia of motion.
- The difference between impulse and impact force is the time the force acts.
- The net momentum before collision = net momentum after collision

Chapter 7

- What is gravitational potential energy?
- What is kinetic energy and how is it related to speed?
- What are some forms of energy?
- What is the conservation of energy?

    - Work = force times distance
    - The unit of work is the joule.
    - Power tells us how fast work is done: Power = work divided by time
    - The unit of power is the watt.
    - When we do work on an object we transfer energy to it.
    - Energy enables us to do work on something else.
    - The unit of energy is the joule.
    - The two types of mechanical energy are PE and KE
    - A machine is a device for multiplying or changing the direction of a force.
    - Only **relative** position and velocity are important for PE and KE